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Inventory, Descriptions, and Keys to Segregation and Identification of Liriopogons Cultivated in the Southeastern United States

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Abstract. **Liriopogons is a name used for cultivated genera of *Liriope* and *Ophiopogon*, Ruscaceae. Liriopogons are the most important clonal groundcovers sold by the nursery industry in the southeastern United States. Accurate segregation and identification of cultivars is difficult as cultivar descriptions used in nursery catalogs, literature, and plant patents are qualitative in substance, and often limited in morphological data. Also, existing inventories are limited in data. Many cultivars are assigned to the wrong species, and sometimes to the wrong genus. A taxonomic project of nearly 30 years' working with liriopogon cultivars has culminated in this article. Included are the project history, nomenclatural history, cultural practices that degrade cultivar integrity, ornamental morphological genetic traits, and an inventory of cultivars. The inventory includes nearly 225 valid and invalid names, plus temporary names for clones under evaluation, an ordering of the nomenclature, quantitative morphological descriptions, cultivar origins where known, sources of material studied, and pertinent notes and observations. Provided is a key to segregation and identification of cultivars, a tool that can assist those in the industry and those seeking plant patents.**

Liriopogons is the name proposed by Skinner (1971) for cultivated plants of the genera *Liriope* Lour. and *Ophiopogon* Ker-Gawl (Ruscaceae Hutch, previosly assigned to Asparagaceae Juss., Convallariaceae Horan., Haemodoraceae Arnott, Ophiopogonaceae Kunth, and Liliaceae Juss.). Liriopogons are evergreen, grass-like perennials used in landscapes as casual groundcovers in small areas, entryways, or courtyards, and as borders along paths, edging beds, driveways or sidewalks, in rock gardens, along streams, around bases of trees or shrubs, in containers, and around home landscape pools (Fantz, 2008b, 2009; Holmes et al., 2001; Sunset Editorial Staff, 1997; Tenenbaum et al., 1994). Plants grow in partial sunlight to full shade, and are regarded as drought tolerant for short periods (Holmes et al., 2001; Huxley et al., 1992; Tenenbaum et al., 1994). Liriopogons are the most important clonal groundcovers sold by the nursery industry in the southeastern United States (Mcharo and Urbatsch, 2003). Their value in North Carolina were estimated to be over $41 million for 2009 (Trueblood, 2009).

Species of *Liriope* are commonly known as lilyturfs. Species of *Ophiopogon* are commonly known as mondo grass or monkey grass, less frequently as snake's beard, border grass, or aztec grass (Fantz, 2008a; Huxley et al., 1992; Sunset Editorial Staff, 1997; Tenenbaum et al., 1994). In addition, monkey grass has been applied to creeping species of *Liriope* (Fantz, 2008a). The vernacular name aztec grass used in landscape/nursery industry is applied specifically to variegated selections of two *Ophiopogon* species, often marketed as *Liriope* (Fantz, 2008a). Green aztec grass is applied to two species of *Liriope*.

Accurate identification of liriopogon cultivars is difficult as cultivar descriptions used in catalogs and literature are qualitative in substance. Thus, one description (e.g., scapes overtop leaves with purplish flowers; leaves variegated with a golden margin) can be applied to several cultivars. Historically, cultivar inventories were limited (Adams, 1980; Hume, 1961; Hume and Morrison, 1967) and one had to read each description and compare data to identify an unknown clone. Hatch (2011a, 2011b) reported a large number of clones. But, it is incomplete with the names of clones that exist in the nursery/landscape trade. Descriptions are qualitative and limited or sometimes nearly lacking. Keys to segregation are lacking, and some cultivars are assigned to the wrong species, following the common practice in the nursery/landscape industry. Nesom (2010) cited the largest number of cultivars, assigning them to species. However, they lack any description except "v." for variegated. Historically, new cultivars were assigned to *Liriope muscari* (Decne.) L.H. Bailey or *Ophiopogon japonicus* (Linn. f.) Ker-Gawl. Presently, new cultivars are assigned similarly, but actually belong to several species poorly known in the trade. Fantz (2008b, 2009) reported 14 species of liriopogons cultivated in the southeastern United States, whereas Nesom (2010) reported eight.

Liriopogons are herbaceous evergreens involving over 200 names in two genera. The objectives of this article are to provide 1) an inventory of liriopogon cultivars cultivated in the southeastern United States, 2) ordering of the nomenclature, 3) new quantitative descriptions from research data obtained from live plants and herbarium vouchers, 4) origins and sources of plants examined, 5) notes and observations, 6) keys to assist in the segregation and identification of cultivars, and 7) select lectotypic standard vouchers for deposit in herbaria.

Materials and Methods

Germplasm of liriopogons cultivated in the eastern United States were accumulated from various sources (Table 1) and grown together from Fall 1986 to 2005 at the Horticultural Field Laboratory, NC Agricultural Research Unit IV, Raleigh, NC. Cultural procedures followed those described by Fantz (1993, 2008a). Plants were grown in research plots at Unit IV under shadecloth. Cultivars were assigned in consecutive accession numbers with individual bibs (daughter plants) from one source labeled by different letters (e.g., 85–005a-j). New accessions were planted each spring in different rows. Planting of liriopogon bibs, weeding, and bed maintenance were done by hand.

We thank Paul Lineberger, retired Superintendent, Horticultural Field Laboratory, Raleigh, NC and his staff for cultural assistance to the project leader with the germplasm collection used in this study. Appreciation to those individuals, nurseries, and botanical gardens that donated plants for research, specifically Clarence Landis, Monticello, FL, Evergreen Nursery, Athens, GA, Classic Groundcovers, Athens, GA, Louisiana Nursery, Opelousa, LA, Plant Delights Nursery, Raleigh, NC and JC Raulston Arboretum, Raleigh, NC, for extensive donations of many liriopogon cultivars for this research project. Publication funds supplied by Plant Delights Nursery. We also thank Brian E. Jackson, Thomas G. Ranney, and Anne M. Spafford for their critical review of the manuscript.

Use of nursery and trade names in this publication does not imply endorsement by NCARS of the nurseries or the products mentioned, nor criticism of similar ones not mentioned.

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Table 1. Project inventory of sources of liriopogon cultivar plants.

Nurseries
Andre Viette Perennials, Fisherville, VA
Bentlay Nursery, Monticello, FL
Busse Gardens, Cokato, MN
Carolina Nursery, NC
Carroll Gardens, Westminister, MD
Classic Groundcovers, Athens, GA
Coastal Gardens, Myrtle Beach, SC
Cypress Groundcover, Cypress, TX
Doug Young Nursery, Forest Hill, LA
Evergreen Nursery, Athens, GA
Fowler's Nursery, Clayton, NC
Garden Place, Mentor, OH
Gärtnerischer Pfanzenbau, Staudenweg, W. Germany
Greenbrier Farms, Chesapeake, VA
Hines Nursery, Fulshear, TX
Horticultural Products, Inc., Apollo Beach, FL
Kurt Bluemel, Inc., Baldwin, MD
Louisiana Nursery, Opelousas, LA
Malloy's Nursery, Monticello, FL
Micro Macro International, Windermere, FL
Monroe Landscape Co., Atlanta, GA
Plant Delights Nursery, Raleigh, NC
Powell Gardens, Princetown, NC
Riegel Plant Company/Riegel Nursery, Griffin, GA
Shady Oaks Nursery, Waswea, MN
Spring Hill Nursery, Cokato, MN
Swift Creek Nurseries, NC
Taylor Nursery, Raleigh, NC
Thomasville Nurseries, Thomasville, AL
Tidwell Nurseries, Greenville, GA
Willis Nursery Company, Inc., Ottawa, KS
Windmill Farms, Sebring, FL
Botanical Gardens
Brookside Gardens, Wheaton, MD
Hangzhou Botanical Garden, China
JC Raulston Arboretum, Raleigh, NC (formally NC State University Arboretum)
U.S. National Arboretum, WA, D.C.
Individuals
Paul Aden, Long Island, NY
Richard Hartledge, Raleigh, NC
Clarence Landis, Monticello, FL
J.C. Raulston, Raleigh, NC
Alex Summers, Bridgeville, DE
Herbarium Vouchers
University of Florida, Gainesville, FL (FLAS)

Duplicate bibs of accessions and new, rare taxa were grown in the North Carolina Horticultural Science Greenhouse, located on the campus of North Carolina State University (NCSU) in Raleigh.

Plants were observed during these years, research data collected, and herbarium vouchers prepared for each accession. Numerous nurseries in the southern United States were visited between 1985 and 1987. Additional cultivars were obtained and field data were collected on liriopogons for morphological comparison. Data collected contributed to the quantitative botanical descriptions in this study. Internet descriptions of patented cultivars were used and data supplemented by examination of live plants. Also, legalized names were included herein, but cited by the styling (e.g., AMETHYST) recommended by the International Code of Nomenclature for Cultivated Plants (Brickell et al., 2009) to avoid the use of these epithets in names of cultivars.

Mesasurements followed standard taxonomic procedures. Plant vouchers were collected by Fantz and Lattier for documentation of taxa studied. Each cultivar included a sample of accession numbers of representative vouchers that will be deposited in national herbaria. Most vouchers will go to the NCSU Herbarium, Raleigh, NC and the National Arboretum Herbarium (NA), Washington, DC, with extra duplicates donated to the University of Florida (FLAS), Gainesville, FL; Louisana State University (LSU), Baton Rouge, LA; Missouri Botanical Garden, St. Louis, MO; and the University of Texas (TEX), Austin, TX. Internationally designated acronyms in parenthesis for each herbarium follow Holmgren and Holmgren (1990).

Project History

A project was started by Fantz in 1985 to address the landscape/nursery problem of liriopogon cultivar misidentification and segregation. Fantz (1993, 1994) reported taxonomic problems encountered with cultivated liriopogons, especially species and genera misidentification.

Riegel Nursery, the place of origin of several older cultivar selections, went out of business before the project began. Clarence Landis had obtained each clone from Riegel Nursery and was growing them. He donated bibs of 31 selections in 1986 to the project for study.

Rabbits were a problem in 1990. They would eat juvenile inflorescences and young leaves, but only from specific liriopogon clones, ignoring different selections that were adjacent to those eaten. Rabbits consistently sought bibs in different plots of the same accession, and often the same cultivar from different sources.

Research funds were reduced severely in the 1980s and early 1990s. Limited research funds were a major obstacle to publishing further data. As a result, Fantz's research became focused on providing requested treatments of resupinate papilionaceous legumes for international floristic projects, funded by the host organization. Administration in 1998 imposed a greenhouse fee per square feet of space. Thus, all greenhouse-potted liriopogons were ended and vouchered. In 2003, liriopogon research beds were destroyed to prepare the site for building construction. A sample of each accession was potted and placed in space shared with a colleague. Plants were over irrigated at this site, many developing root rot and dying. The remaining pots of liriopogons (34 cultivars, 70 accessions) were donated to the JC Raulston Arboretum in 2004.

Several newer cultivars were being introduced into the trade. Trademarking liriopogons had begun, leading to legalized names that were different from cultivar names, creating more confusion. Fantz continued vouchering and accumulating data on live plants, working with Petra Schmidt, plant recorder, Plant Delights Nursery, Raleigh, NC, in 2002. Fantz was consulted on liriopogon projects by Catherine Boussard visiting in 2006 (Broussard, 2007) and Guy Nesom (Nesom, 2010). Fantz worked with Jason Lattier's MS project in 2011–2013 on liripogon genome size and chromosome numbers that included several cultivars (Lattier et al., 2014). Fantz continued working on cultivars with the large liriopogon collection at Plant Delights Nursery with coauthors in 2011–2014.

The termination of this project began with a publication grant from the North Carolina Association of Nurserymen, resulting in a taxonomic treatment segregating the liriopogon genera, species of *Liriope* and *Ophiopogon* (Fantz 2008a, 2008b, 2009). This current taxonomic treatment of cultivars culminates nearly 30 years on this project by Fantz.

Nomenclatural History

Historically, most *Ophiopogon* cultivars were assigned to *O. japonicus*. However, *O. jaburan* (Sieb.) Loddiges and *O. planiscapus* Nakai have had cultivars assigned to them, lacking controversy with the species name.

Cultivars of *Liriope* historically were assigned to *L. muscari*. There are "variations" that have created taxonomic problems of classification and controversy with the species name.

Wang and Tang (1951) proposed a new species *L. platyphylla* F.T. Wang & T. Tang for *L. muscari* Bailey, but Bailey's combination was based on *O. muscari* Decne. Thus, the name was assigned as a synonym of *L. muscari*. Fantz suspected a misidentification, requested type material in late 1990s, and received six 3 × 5 slides of herbarium material. Observation and data from the slides revealed that the plant material had been misidentified as *L. muscari*. Fantz (2008b) resegregated *L. platyphylla* from *L. muscari*. Nesom (2010) regarded *L. platyphylla* as a variant of *L. muscari*, but noted that he was unable to adequately assess if these are conspecific as *L muscari* appeared to be restricted to eastern Chinese provinces and *L. platyphylla* to southeastern Chinese provinces. He noted that more detailed study is necessary to portray the variation accurately. *Liriope platyphylla* is recognized herein as a distinct species from *L. muscari*.

Hume (1961) reported some cultivars under *L. exiliflora* (Bailey) Hume and *L. gigantea* Hume, distinct from *L muscari*, but the latter names were not recognized in the trade until recently. Hume's *L. exiliflora* was based upon Bailey's (1929) *L. muscari* var. *exiliflora* (syn. *Convallia spicata* Thunberg). Fantz (2008b), Hatch (2011a), and Lattier et al. (2014) agreed that these two species are segregated from *L. muscari* and accepted them. Also, Nesom (2010) recognized *L. gigantea* as distinct from *L. muscari*. Fantz reported that *L. exiliflora* is more common in cultivation than *L. muscari*.

However, Nesom (2010) reported that Bailey (1929) intended var. *exiliflora* as a new name for Thunberg's plant from Japan. Nesom proposed evidence that Hume's

species does not occur in Japan and that Hume misinterpretated Bailey's type. Nesom concluded that the name *L. exiliflora* should be a synonym of *L. muscari*. In addition, Nesom cited *L. graminifolia* (L.) Baker as similar in aspects with *L. muscari*, and that the only consistent diagnostic feature is the growth habit, stoloniferous in *L. graminifolia* and caespitose (clumping) in *L. muscari*. His comments included Fantz's (2008b) useful technique for distinguishing *L. muscari* and *L. exiliflora* in the field. In addition, Nesom cited that *L. exiliflora* sensu Hume = *L. graminifolia*, reporting it as the most common species of *Liriope* in the Lower South. Nesom's description of *L. graminifolia* was emended (e.g., wider leaves fide Fantz; abundant fruit set) to include material assigned to Hume's *L. exiliflora.*

Two accessions (91–156 and 91–160) of *L. graminifolia* from China included in Fantz's project were received from the National Arboretum in 1991. Both plants were misidentified as *L. spicata* Lour. Fantz did not observe a true representative of the species until 2012, although Carey and Avent were observing the species' growth for several years. Therefore, we disagree with Nesom's conclusion of lumping Hume's species into *L. graminifolia*, regarding them as two distinct species. We recognize *L. graminifolia* as having leaves long and narrow, 63 cm long × 1–6 mm wide, veins 5–11, elongated scapes (33–62 cm) at maturity, peduncles 3–4x rachis length, no variation within the rachis, bracts (2–3 mm) and pedicels typically shorter (1–3 mm), flower color lighter, lavender to paler, and fruits in cultivation as uncommon. Contrasting, Hume's *L. exiliflora* has shorter broader leaves, to 30 cm long × 6–12 mm wide, veins 9–15, shorter scapes (17–29 cm) at maturity, peduncles 2–2.5x rachis length, rachis variation with occasional cockscombs, fasciation or lateral branching, longer bracts (3–5 mm, sometimes with elongated foliar bracts) and pedicels (3–5 mm), flower color darker, bluish-purple to lavender, and fruits abundant in cultivation.

We agree with Nesom that Hume's species is distinct from *L. muscari,* but disagree with his opinion that growth form is the only way to distinguish these species. Floral aspects of a conspicuous perigone (0.5–1 mm), a peduncle length 2–3 times rachis length, a scape length subequal to 1.5 times peduncle length, and ovate bracts are distinctive. Whereas *L. exiliflora* exhibits clumping form for several years, *L. muscari* has an inconspicuous perigone (lacking to 0.5 mm), a peduncle length 1.5–2 times longer than rachis length, a scape length 2–3 times peduncle length, lanceolate bracts and a true caespitose habit lacking lateral rhizomes. It is agreed that Hume may have misinterpreted Thunberg's species from Japan. Should Hume's species be renamed if the name is placed in synonymy with *L. muscari*? Presently, as the only name available, we use *L. exiliflora* herein for this species that is distinct from other species of *Liriope*.

Ophiopogon japonicus var. *caespitosus* Okuyama is a varietal name whose usage is not recognized by present taxonomists and the name is treated as a synonym of the specific name (IPNI, 2005; Kew, 2009; Tropicos, 2014). Typical *O. japonicus* produces a creeping habit with daughter plants on rhizomes away from the parent plant. There are three cultivars (Aritaki, Gracilis, and Seoulitary Man) that produce tight, dense clumps, getting wider with age, but not creeping. These selections of *O. japonicus* are very distinct. We use the varietal name as the only name available. Future researchers should tackle this problem to determine if it is a true variety, or a distinct species. In addition, some cultivars herein are assigned to *L. minor* (Maxim.) Makino, *L. longipedicellata* Wang & Tang, *L. spicata*, *O. bodinieri* H. Lév, and *O. intermedius* D. Don. Other species names found in U.S. nurseries and arboreta include *O. caulescens* Backer, *O. clarkei* Hook. f., *O. formosanus* Ohwii, *O. kansuensis* Bat., *O. reversus* C.C. Huang, *O. scaber* Ohwii, and *O. umbracticola* Hance (formally labeled as *O. chingii* Wang & Tang). No cultivars have been assigned to them.

Cultivar Integrity Degraded by Cultural Practices

Several practices in the nursery industry lead to deterioration of cultivar integrity. Altering cultivar integrity leads to problems in identification and nomenclature, creating future taxonomic confusion.

Cultivar identification of unknowns. Many cultivars lack published quantitative descriptions and comparisons with similar clones in the trade. Some nurserymen and landscapers have expressed a "competitive disadvantage" with their clientele when the liriopogon lacks a cultivar name. Thus, the reported practice is to "guesstimate," assigning a cultivar name because it "appears to be" or "looks similar" and "seemingly matches description or photograph," or agrees with their memory image of a labled plant seen elsewhere. Once misidentified, the error is multiplied with each propagule. These plants should be labeled only to level of species, not to cultivar.

Cultivar name changing. Infrequently reported to Fantz was a practice of changing label names to meet clientele's demands or improve sale quotas. Frequently expressed rationale was "satisfy customer by giving him what he wants" or "I need to move a clone not selling" and "I'm in the business of selling plants, not name regulation." A few increased sale prices with a rarer cultivar name that is difficult to find. Most nurserymen deplored these practices, wanted accurate names, and were receptive to data regarding misidentification of their plant.

Cultivar identification by growth form. Many nurserymen segregate cultivars by "clumping" vs. "creeping."

A common misidentification occurs with *L. muscari* and *L. exiliflora* cited by Hume (1961) and Fantz (2008b). Cultivars of *L. exiliflora* commonly appear caespitose (clumper) at a young age as daughter plants are produced very close to the parent plant on 0.5–5 cm runners. However, after maturing for 4 to 5 years, the daughter plants are produced on longer runners, giving mature plantings a broad clumping to creeping appearance. A common identification problem in the industry is the controversial 'Big Blue' (clumper) and 'Tidwell Big Blue' (runner).

Propagation. Liriopogon cultivars should be propagated asexually by divisions, separating daughter plants with roots (a bib in nursery trade) from the parent plant. This can be a slow process for those cultivars producing limited number of daughter plants in a season. Some nurserymen collect fruits and sow the seeds to obtain new bibs that are assigned the source name. This practice is desired to obtain more bibs than divisions could. These seed plants show genetic variation and are not true clones (e.g., 'Arabicus'). This practice is good for searching for new desirable traits, but poor for maintaining cultivar integrity, as one does not know the other parent plant. "Mutated" and "open-pollinated" plants found in a bed, frequently cited in plant patents, probably occurred from seeds in bird droppings germinating in the bed.

Labeling practices. Some nurseries grow plants in the field between distinct markers. Any plant collected within a plot gets that cultivar name. The problem arises at the borders where a creeping cultivar sends out an underground rhizamatous shoot and the daughter plant appears in the adjacent plot. Thus when collected, the daughter plants get labeled with a false cultivar name.

Labeling every bib can be time consuming and costly. Some nurserymen avoid this by placing potted bibs behind one sign with the cultivar name. Fantz has visited nurseries that had name signs removed by children and the arrangement disturbed when storms moved pots everywhere. Thus, their true identities became obscured.

Another obfuscating practice is using abbreviated names on labels. 'Christmas Tree' was obtained with labels from a nursery that bore the names 'Xmas Tree' and 'Xmas' and 'Pee Dee Ingot' with labels of 'PDI'. In addition, descriptive terms are used on labels or in advertisement (e.g., catalogs) that later became cultivar names. 'Aztec', 'Dwarf', and 'Variegata' are a few examples.

Substitution. Mail order nurseries reserve the right to substitute a plant if stock quantity is low or not available when filling an order. Problems arose when consumers were not informed of the substitution. This practice can affect research data or the customer using the misidentified bibs to build up stock in their nursery for later sales.

Ornamental Morphological Traits

There are a number of phenotypic traits exhibited in the plant's morphology that nurserymen and consumers find desirable.

Historically, cultivar descriptions focused on growth form (clumper vs. creeper; dwarf vs. tall plants), leaf color and variegation, rachis variation, and flower color. *Ophiopogon* species have flowers nodding with subsessile, actinomorphic (radial symmetry) stamens, whereas, *Liriope* species have flowers upturned with stalked, zygomorphic (bilateral symmetry) s-shaped staments (Fantz, 2008a). These traits and others noted in the following sections are used to divide cultivars into groups for segregation and identification.

Growth form. Growth form is important in selecting the correct plant for a specific landscape use or location. Most liriopogons are rhizatomous, producing underground runners with daughter plants borne apically. Some produce daughter plants near the parent, forming clumps or mounds, whereas other selections become wider spread with soil gaps between plants. Some selections, especially in *L. exiliflora,* exhibit clumping in early years, then spread more rapidly after 4–5 years with daughter plants far away from the parent. Dwarf selections commonly grow from 5 to 15 cm tall with age, often forming mounds or clumps, with many belonging to *O. japonicus*. Most cultivars are small plants, typically 20–45 cm tall. A few are large-growing clones, growing 40–100 cm high. These cultivars belong to *L. gigantea*, *L. platyphylla*, *O. intermedius*, and *O. jaburan.*

Leaf color. Plants are vegetative much of the year, thus foliage color is an important visual trait. Green foliage selections resemble grasses, hence ''grass'' used as part of the vernacular name. Rare nongreen foliage color is highly desirable in ornamental landscape plants. Cultivars with rare purplish-black foliage are distinctive and belong to *O. planiscapus*. However, some selections with age produce daughter plants with green leaves, losing the purplish-black trait. Another rare trait is yellow-leaved plants and ''bleached'' whitish foliage. These may produce green maculation or blotches with age.

Green leaves with variegated foliage often are selected in cultivars. Common variation is marginal bands and/or narrow longitudinal stripes. Color is commonly yellow that fades to creme or whitish/silvery with age. Less common are those with transverse (horizontal) bands or maculation (spots, blotches), the variegation usually yellow in color.

Flower color. Liriopogon flowers are anthocyanin pigmented, from pink to lilaceous/lavender to purple/violet. Chroma varies from pale to dark shades, and in a cultivar, the flower color can vary with age of the plant, season, and in different years (Fantz 2008a). White flowers are uncommon in liriopogons, thus a prized trait and easily recognized.

Rachis variations. The rachis is the part of the scape (leafless inflorescence) atop the peduncle that has fascicles of flowers, from one to five or nine typically per fascicle. The rachis is described in literature as a raceme, an axis with each flower stalked. Actually, the rachis is a raceme of dichasia (three flowered) or compound dichasia (five to nine flowered).

Cultivars typically bear one rachis. In some cultivars, a variation may include: 1) an inflorescence with several rachises (one elongated, others short) at the apex of the peduncle (basal stalk of the scape/inflorescence), 2) a cockscomb with expansion of the rachis in width upward providing more surface area for additional flowers, and 3) branching, bearing one or more lateral branches near the base, bearing lateral branches along the rachis from base to apex, or bearing terminal branches (fasciation) at the apex of the rachis. Fasciation will often occur with a cockscomb. These variations occur in several species of *Liriope*. In addition, giant inflorescences of several feet occur infrequently, including a rachis branched near the base into two giant rachises. These traits are associated with *L. platyphylla*. Rachis variation is not formed in each inflorescence, but distinctive when produced more frequently or consistently, as in 'Christmas Tree', 'John Burch', and 'Samona'.

Fruits. Juvenile fruits are green, the seedcoat maturing to black or purplish-black commonly in *Liriope* and blue to violet in *Ophiopogon*. Rarely, the coat ruptures (e.g., 'Silver Dragon') as the whitened seed matures, and may bear specks of seedcoat color on the seed. Fruits in many selections abort, not reaching maturity. Fruits are abundant commonly in selections of *L. exiliflora*, often aborting in *L. muscari*.

Inventory of Cultivars

Additional morphological traits

There are several nonornamental morphological traits useful in segregating similar cultivars. Bracts are leaf-like structures subtending flowers. Foliar bracts occur only on the first inflorescences produced, and are conspicuously longer than typical bracts. They were not observed in many cultivars, but striking when tips elongated in some bracts to 20–200 mm long, usually by 1 mm wide.

The perianth is the part of the flower consisting of the tepals in most descriptions, free at the top and fused basally. The abrupt, fused, narrow tubular portion above the articulation point of the pedicel (individual flower stalk) is the ''perigone,'' or ''floral tube'' of Nesom (2010). It is a poorly known trait, but consistent within a cultivar. Easier for readers to visualize is to observe a lily where the perigone is very large and conspicuous.

Leaf veins are raised below, sometimes weakly ribbed on the leaf surface above. Vein number is consistent on cultivars with narrower leaves. Broader-leaved cultivars have additional depressed veins that become raised as the leaf broadens. Vein number between narrow juvenile and broader leaves on the same plant have a wide range of variablity, thus it is not a useful morphological trait in these cultivars.

Also, older plants seasonally and annually produce taller plants and longer leaves, scapes, and peduncles. Rachises are more consistent in lengths. A measurement value in parenthesis was one obtained infrequently outside the typical measurement range, and probably represents a younger plant.

Taxonomic treatment

An inventory of cultivated liriopogons is presented in the section Inventory of cultivars, arranged alphabetically by name. Valid cultivars and trademark names recognized are boldfaced, whereas those names treated herein as invalid names lack boldface. Notes are provided as to the decision for not recognizing invalid names, followed by their correct cultivar name in boldface for synonyms and othographic (spelling) errors.

Each cultivar description is quantitative and based on accumulated data, followed by the probable species to which the cultivar should be assigned. Phenology provides the blooming and fruiting season in the Raleigh, NC area. Origin is designated as best known currently. Sources were the live plants examined in this study, including the species name used at the source if different from the name assignment herein. Accessions include Fantz accession numbers that will appear on herbarium vouchers and those that Lattier examined. Notes include data obtained from Internet sources or literature. Observations include author's comments.

A key to assist identification and segregation is presented (Table 2). The key is large due to the number of cultivars. Blocks of the key are based upon groups of cultivars with a distinctive trait (e.g., purplish-black leaves, white flowers). Therefore, boldface trait headings are placed among the key couplets to assist the reader. However, it is recommended to begin with couplet number one when first using the key.

Plant patents provide original source documentation for some cultivars and trademarked names. A herbarium voucher was selected by Fantz as the lectotypic standard for other taxa (Table 3). Lectotypic standards are those designated by a later author (e.g., Fantz) to represent the cultivar, not selected by the original author (clone originator).

Inventory of cultivars. '1103' *Accessions*: 87–083, 87–084. Invalid name, a label abbreviation = **'Eleven-O'Three'**

'Alba'. Creeping groundcover forming loose clumps 15–24 cm tall, daughter plants 1–3 cm away from parent, to 7–11 cm away with age. Leaves erect, arching above middle, green, 18–29 cm long, 4–8 mm wide, veins 9–11. Scapes numerous, 18–30 (–38) cm, peduncle green, 14–22 cm; rachis greenish-white, (3–5) 9–16 mm, occasionally bearing a cockscomb 4–6 mm wide, or fasciated; branches 2–6 mm long, or bearing a basal branch 1–3 cm long; bracts 2–4 mm, foliar bracts 7–18 mm; pedicels whitish, 2–3 mm, buds white. Flowers upturned, white; perianth 3 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit abort. (*L. exiliflora*).

Table 2. Key to liriopogon cultivars catagorized herein. The key is long, thus interspersed among the couplets are italicized morphological traits to aid those preferring to skip directly to that point in the key.

1. Leaf apices strongly incurved ____ 11
1. Leaf apices arch outward to outward-down, not incurved ____ 2
2. Flowers white ____ 13
2. Flowers pigmented, pale to dark hues of pink, lilac, lavender, bluish-purple, purple ____ 3
3. Rachis 2–5, or solitary with either a cockscomb or bearing branches ____ 40
3. Rachis solitary, unbranched, nor forming a cockscomb ____ 4
4. Leaves primarily one color, nonvariegated ____ 5
4. Leaves variegated ____ 6
5. Leaves greyish-purple, purplish-black or yellow to chartreuse, nongreen ____ 90
5. Leaves green ____ 9
6. Leaf variegation with spots or blotches, or transverse bands ____ 110
6. Leaf variegation with a marginal colored band and sometimes with additional stripes ____ 7
7. Plants dwarf at maturity, 2.5–18 cm tall ____ 117
7. Plants over 20 cm tall at maturity ____ 8
8. Height 40–70 cm tall, large plants at maturity with marginal band ____ 130
8. Height 20–40 cm tall, small plants at maturity with a marginal band ____ 132
9. Large plants at maturity, 40–90 cm tall at maturity ____ 146
9. Smaller plants at maturity, 15–40 cm tall ____ 10
10. Height 15–18 cm tall, dwarf plants with green foliage ____ 158
10. Height 18–40 cm tall, small plantz with green foliage ____ 168

Cultivars with strongly incurved leaves

11. Fowers nodding, white ____ **Curly Lady**
11. Flowers upturned, purplish ____ 12
12. Plant height 20–40 cm tall, leaves average 38 cm long ____ **CASSIDY**
12. Plant height 10–16 cm tall, leaves 19–29 cm long ____ **Curly Tops**

Cultivars with white flowers

13. Leaves narrow, 1–4 mm wide ____ 14
13. Leaves broader, 4–17 mm wide ____ 20
14. Leaves green ____ 15
14. Leaves variegated or yellowish ____ 16
15. Leaf blades strongly incurved, perianth 3 mm, perigone 1 mm ____ **Curly Lady**
15. Leaf blades arching outward, perianth 4–5 mm, perigone 3–4 mm ____ **Tuft Tuft Silver**
16. Leaves golden to yellowish with narrow green stripes ____ **Tears of Gold**
16. Leaves green with yellow marginal band and stripes ____ 17
17. Plant height 4–6 cm, leaves 2.5–8 cm long ____ **Tamaryu Nishiki**
17. Plant height 9–27 cm tall, leaves 9–20 cm long ____ 18
18. Rachis 1/4–1/3 the length of the peduncle, perianth 3 mm, leaf veins 11–17 ____ **Nana Variegata**
18. Rachis ½ the length of the peduncle, perianth 4 mm, leaf veins 5–7 ____ 19
19. Rachis black ____ **Aztec Prince**
19. Rachis dark green ____ **Haku Ryu Ko**
20. Flowers upturned, stamens ztalked, zygomorphic ____ 21
20. Flowers nodding, stamens subsessile, actinomorphic ____ 27
21. Leaves nonvariegated, green to dark green ____ 22
21. Leaves variegated with marginal bands or stripes, green and yellow to creme ____ 25
22. Plant creeping, perigone 0.5–1 mm, leaf veins 9–11, foliar bracts 7–18 mm ____ **Alba**
22. Plant caespitose, perigone lacking to 0.5 mm, leaf veins 13–25, foliar bracts lacking to 6–8 mm ____ 23
23. Rachis 5–7.5 cm, scapes 22–28 cm ____ **Moore's White**
23. Rachis 8–18 cm, scapes (24–) 33–50 cm ____ 24
24. Plant height 15–24 cm, scapes 24–38 cm, rachis 8–13.5 cm, foliar bracts lacking ____ **Monroe's White**
24. Plant height 25–40 cm, scapes 34–50 cm, rachis 12–18 cm, foliar bracts 6–8 mm ____ **Traebert White**
25. Caespitose, height 30–42 cm, perigone inconspicuous, to 0.5 mm ____ **Variegated White**
25. Weekly creeping, height 10–30 cm, perigone conspicuous, 0.5–1 mm ____ 26
26. Height 10–15 cm, leaves longer to 48 cm and broader to 17 mm ____ **C.T. Tanner**
26. Height 20–30 cm, leaves shorter to 32 cm and narrower to 9 mm ____ **White on White**
27. Leaves green, nonvariegated ____ 28
27. Leaves variegated ____ 31
28. Leaves 7–18 mm wide, rachs 4–15 mm, perigone 3–5 mm, height 40–90 cm ____ 29
28. Leaves 3–7 mm wide, rachis 1–5.5 cm, perigone 0.5–2 mm, height 9–25 cm ____ 30
29. Peduncle 15–21 cm, perianth 6–7 mm, height to 90 cm tall ____ **CRYSTAL FALLS**
29. Peduncle 24–44 cm, perianth 5–6 mm, height to 60 cm tall ____ **Ursula's Blue Fruit**
30. Height 9–12 cm, perigone lacking to 0.5 mm, scapes 10–11 cm, rachis 1–1.5 cm ____ **Crested White**
30. Height 15–25 cm, perigone 2 mm, scapes 18–22 cm, rachis 4.5–5.5 cm ____ **Leucantheus**
31. Flowers large, perianth 6–9 mm, perigone 4–5 mm, pedicels 5–10 mm ____ 32
31. Flowers smaller, perianth 3–5 mm, pedicels 2–5 mm ____ 34
32. Perianth 6–7 mm, peduncle 43–49 cm, fascicles 15–25, leaf veins 7–13 ____ **Aureovariegata**
32. Perianth 7–9 mm, peduncle 21–35 cm, fascicles 25–40, leaf veins 19–29 ____ 33
33. Height 30–40 cm tall, leaves 8–12 mm wide, foliar bracts 15–31 mm ____ **Wuhan Variegated**
33. Height 40–90 cm tall, leaves 9–17 mm wide, foliar bracts 25–77 mm ____ **Argenteovittatus**
34. Plant dwarf, 12–15 cm tall ____ **Silver Shower**
34. Plant small to large, 20–60 cm tall ____ 38
35. Height 45–60 cm tall, leaves 30–60 cm long ____ 36
35. Height 7–35 cm tall, leaves 13–42 cm long ____ 37
36. Rachis 17–21 cm, scape 17–37 cm, leaf width 7–11 ____ **Variegated Evergreen Giant**
36. Rachis 6–7 cm, scape 10–13 cm, leaf width 4–6 mm ____ **Mexican Giant**

(*Continued on next page*)

Table 2. (*Continued*) Key to liriopogon cultivars catagorized herein. The key is long, thus interspersed among the couplets are italicized morphological traits to aid those preferring to skip directly to that point in the key.

37. Rachis 3–4.5 cm, fascicles 6–9 ____ **Haku Ryu Ko**
37. Rachis 7–11 cm, fascicles 25–32 ____ 38
38. Leaves twisted slightly at base, scapes 16–26 cm ____ **Twisted Variegata**
38. Leaves nontwisting, scapes 13–20 cm ____ 39
39. Leaves 19–30 cm, veins 11–15, foliar bracts lacking ____ **Grandiflora White**
39. Leaves 33–42 cm, veins 9–11, foliar bracts 9–11 mm ____ **Argenteomarginata**

Multiple ascending rachises above the peduncle

40. Peduncle apex bearing 2–5 multiple rachises, unbranched, lacking a cockscomb ____ 41
40. Peduncle apex bearing one rachis only, bearing branches, or forming a cockscomb ____ 46
41. Rachises 2, a single rachis forked less than 1 cm above base into two ascending branches ____ 42
41. Rachises 2–5, an elongated central rachis surrounded by short rachises ____ 43
42. Leaves green, ascending rachis branches 17–20 cm ____ clone no. 5—**Garden Delights**
42. Leaves variegated with yellow to creme marginal band, ascending rachis branches 2.5–4 cm ____ **Sunproof**
43. Leaf variegated with whitish marginal band, vweins 9–13, rampant creeper ____ **Silver Dragon**
43. Leaf green, nonvariegated, veins 15–27, clumper ____ 44
44. Central rachis 70–81 cm, surrounding rachises to 5.5 cm, leaf width 12–17 mm ____ clone no. 5—**Garden Delights**
44. Central rachis 7–23 cm, surrounding rachises 1–3, leaf with narrower or broader ____ 45
45. Leaf width 7–12 mm, foliar bracts 15–210 cm ____ **Densiflora**
45. Leaf width 14–26 mm, foliar bracts 6–11 mm ____ **Webster Wideleaf**

Rachis forming a cockscomb and fasciation (terminal branches)

46. Rachis forming a cockscomb, width gradually widening apically, typically with fasciation ____ 47
46. Rachis lacking a cockscomb, width gradually narrowing apically, branches terminal to basal ____ 64
47. Leaves variegated ____ 48
47. Leaves non-variegated ____ 50
48. Cockscomb 5–8 mm wide apically, leaves with yellow transverse bands or blotches ____ **Hawk's Feather**
48. Cockscomb 8–17 mm wide apically, leaves with yellow to creme to whitish marginal band ____ 49
49. Peduncle 12–22 cm, cockscombs common, terminal branches 1.5–4 cm ____ **John Burch**
49. Peduncle 26–46 cm, cockscombs occasionally, terminal branches 0.5–1.7 cm ____ **Silvery Sunproof**
50. Leaves yellowish-green, 9–15 mm wide ____ **Summer Beauty**
50. Leaves green to dark green ____ 51
51. Scapes 70–81 cm, rachis 20–35 cm ____ clone no. 5—**Garden Delights**
51. Scapes 14–42 cm, rachis 4–19 cm ____ 52
52. Leaf width range consistent, to 5–12 mm wide ____ 53
52. Leaf width range more variable, broadest to (5-) 12–21 mm wide ____ 57
53. Leaves 15–28 cm long ____ **Moneymaker**
53. Leaves longer, to 30–51 cm long ____ 54
54. Perigone lacking to 0.5 mm ____ 55
54. Perigone 0.5–1 mm ____ 56
55. Cockscomb to 12 mm wide, leaves to 15 mm wide, flowers lighter hue, lavender-bluish purple ____ **Grandiflora**
55. Cockscomb to 20 cm wide, leaves 7–10 mm wide, flowers darker hue, bluish-purple to purple ____ **New Wonder**
56. Height 13–18 cm tall, foliar bracts 6–8 mm, flowers light purple ____ **Blue Spire**
56. Height 25–32 cm tall, foliar bracts 30–35 mm, flowers lavender/bluish-purple ____ **Majestic** *(L. exiliflora)*
57. Flowers purple to dark purple, 3–5/fascicle, terminal branches 2–6 ____ 62
57. Flowers lilaceous-purple, 5–9/fascicle, terminal braches 5–11 ____ 63
58. Rachis 6–19 cm, foliar bracts 6–18 mm ____ **Majestic** *(L. muscari)*
58. Rachis 4–10 cm, foliar bracts lacking ____ **Purple Bouquet**
59. Scapes amongst the foliage, flowers bluish-purple to purple ____ **Royal Purple**
59. Scapes amongst to just above foliage, floers lilaceous ____ **Lilac Beauty**

Cultivars with rachis fasciation (terminal branching), cockscombs lacking

60. Rachis branches terminal (fasciation) ____ 61
60. Rachis branches borne laterally, from basal to below the apex, non fasciated ____ 71
61. Leaves variegated ____ 62
61. Leaves non-variegated ____ 66
62. Peduncles 8–18 cm, leaf variegation bearing a marginal band ____ 63
62. Peduncles 16–32 cm, leaf variegation lacking a marginal band ____ 65
63. Rachis 9–15 cm, nearly vsubequal peduncle length, fasciation branches 5–7 mm long ____ **Gold Banded**
63. Rachis 3–9 cm, nearly half peduncle length, fasciation branches 7–60 mm ____ 64
64. Plant height 13–20 cm tall, foliar bracts 6–10 mm ____ **Silvery Midget**
64. Plant height 20–35 cm tall, foliar bracts lacking ____ **Sunproof**
65. Leaves 3–9 mm wide, irregularly yellow transverse blotches, flowers lavender, perigone to 0.5 mm ____ **Sideswiped**
65. Leaves 6–15 mm wide, whitish becoming green maculate, flowers purple, perigone 0.5–1 mm ____ **Okina**
66. Dwarf plant, 12–15 cm tall ____ **Platypus**
66. Larger plant, 20–50 cm tall ____ 67
67. Scapes 70–80 cm, rachis 20–35 cm, height 40–50 cm tall ____ clone no. 5—**Garden Delights**
67. Scapes 15–56 cm, rachis 7–23 cm, height 17–42 cm tall ____ 68
68. Leaves 14–26 mm wide, peduncle 15–18 cm, rachis subequal peduncle length ____ **Webster Wideleaf**
68. Leaves 4–15 mm wide, peduncle 16–29 cm, rachis nearly half peduncle length ____ 69
69. Fasciation branches 10–50 mm, foliar bracts 7–50 mm, perigone 0.2–0.5 mm ____ **Grandiflora**
69. Fasciation branches 6–12 mm, foliar bracts 6–14 mm, perigone 0.5–1 mm ____ 70
70. Leaves 4–8 mm wide, peduncle 16–21 cm, height 25–32 cm tall ____ **Rocket**
70. Leaves 8–14 mm wide, peduncle 18–33 mm, height 30–38 cm tall ____ **Big Blue** (*L. exiliflora*)

Cultivars with multiple lateral branches on rachis, "tree-like"

71. Rachis branches multiple, borne laterally from apex to base, appearing "tree-like" ____ 72
71. Rachis branches few, borne either above or below the middle of the rachis ____ 73

(*Continued on next page*)

Table 2. (*Continued*) Key to liriopogon cultivars catagorized herein. The key is long, thus interspersed among the couplets are italicized morphological traits to aid those preferring to skip directly to that point in the key.

72. Scape 15–30 cm, plant height 17–22 cm tall, basal lateral branches 2.5–3 cm long — **Christmas Tree**
72. Scape 25–44 cm, plant height 20–40 cm tall, basal lateral branches 3–5 cm long — **Samona**

Cultivars with 1–3 lateral branches from rachis

73. Lateral branches borne above the middle of the rachis — 74
73. Lateral branches borne below the middle of the rachis, typically near the rachis base — 78
74. Leaves green, non-variegated, flowers lavender to bluish-purple — 75
74. Leaves variegated, flowers purple to dark purple — 76
75. Lateral branches 1, to 25 mm long, flowers lavender-purple, height to 45 tall — **Grandiflora**
75. Lateral branches 1–2, 20–45 mm long, flowers lilaceous, height to 32 cm tall — **Lilac Beauty**
76. Rachis 8–18 cm, scapes 26–46 cm, perigone 0.5–1 mm — **Sunproof**
76. Rachis 3–9 cm, scapes 8–18 (-27) cm, perigone lacking to 0.5 mm — 77
77. Lateral branches 2–3, 15–45 mm long, forming a "V" or "trident," height 20–35 cm tall — **Silvery Sunproof**
77. Lateral branches 1, 15–20 mm long, height 13–20 cm tall — **Silvery Midget**
78. Flowers white, perigone 3 mm — **Crested White**
78. Flowers pinkish to lilaceous to purple, perigone lacking to 2 mm — 79
79. Leaves variegated — 80
79. Leaves green to dark green, non-variegated — 81
80. Leaf variegation a marginal band, peduncle 12–22 cm, rachis 10–18 cm — **John Burch**
80. Leaf variegation irregular transverse blotches, peduncle 21–40 cm, rachis 5–13 cm — **Hawk's Feather**
81. Scapes 50–127 cm, rachis 27–41 cm — clone no. 1 **ABG form**
81. Scapes 16–47 cm, rachis 5–23 cm — 82
82. Flowers pink to pinkish-lavender, foliar bracts (9–) 20–120 mm — 83
82. Flowers lavender-purplish to bluish-purple to purple, foliar bracts 5–18 mm — 85
83. Perigone to 0.5 mm, rachis lateral branch to 0.5 mm — **Samantha**
83. Perigone 0.5–1 mm, rachis lateral branch 1–2.5 cm — 84
84. Flowers pinkish-lavender, foliar bracts to 33 mm, leaves to 20 mm wide — **Superba**
84. Flowers pinkish-lavender, foliar bracts to 120 mm, leaves to 12 mm wide — **Densiflora**
85. Leaves 14–26 cm wide, perianth 4–5 mm — **Webster Wideleaf**
85. Leaves 5–18 mm wide, perianth 3–4 mm — 86
86. Plant height 13–15 cm tall, rachis 4–7 cm — **Big Blue Riegel**
86. Plant height 15–40 cm tall, rachis 7–22 cm — 87
87. Perigone 0.5–1 mm, rachis lateral branch 3–7 cm, scape 28–43 cm — **Tidwell Big Blue**
87. Perigone lacking to 0.5 mm, rachis lateral branch 0.5–2.5 cm, scape 22–32 cm — 88
88. Leaves 4–8 mm wide — **Rocket**
88. Leaves 8–18 mm wide — 89
89. Flowers purple, foliar bracts short, 6–7 mm — **Big Blue**
89. Flowers lavender-purple, foliar bracts long, 7–18 mm — **Majestic** (*L. muscari*)

Cultivars with bleached-whitish leaves

90. Leaves a light hue, primarily yellowish to chartreuse/yellowish-green or bleached whitish — 91
90. Leaves a dark hue, primarily greyish-purple to purplish-black — 101
91. Leaves bleached-whitish — 92
91. Leaves yellowish to yellowish-green — 93
92. Perigone lacking to 0.5 mm; fascicles 30–45, leaves green-maculate with age — **Okina**
92. Perigone 0.5–1 mm, fascicles 14–18, leaves weakly mottled below, occasionally green stripes — **Sno Cone**

Cultivars with yellow to yellowish-green leaves

93. Flowers nodding, lighter hues, lilac to pink to white, leaves 1–3 mm wide, rachis 1–5 mm — 94
93. Flowers upturned, darker hues, lilaceous to bluish-purple to purple, leaves 3–15 mm wide — 96
94. Flowers white, leaces yellow occasionally striped green — **Tears of Gold**
94. Flowers pigmented, leaves chartreuse — 95
95. Dwarf plant 10–15 cm tall, flowers lilaceous to purplish — **Spring Gold**
95. Small plant 20–25 cm tall, flowers pinkish — clone no. 6—**Gold Leaf**
96. Leaves 9–15 mm wide, rachis forming cockscombs — **Summer Beauty**
96. Leaves 3–11 mm wide, rachis lacking cockscombs — 97
97. Leaves 14–20 cm long — clone no. 2 **Chumley Variegated**
97. Leaves (16-) 24–64 cm long — 98
98. Scapes 6–22 cm, rachis 2–5.5 cm, plant height 18–20 cm tall — **Majestic** (*L. spicata*)
98. Scapes 24–64 cm, rachis 5–15 cm, plant height 20–48 cm — 99
99. Rachis 10–15 cm, flowers purple — **LIRTP AMETHYST**
99. Rachis 5–10.5 cm, flowers lavender-purplish — 100
100. Plant height 40–55 cm, rachis 5–6 cm, leaves narrower, 3–7 mm wide — **LIRF ISABELLA**
100. Plant height 20–48 cm tall, rachis 5–10.5 cm, leaves broader, 4–11 mm wide — **Peedee Ingot**

Cultivars with foliage grey-purplish to purplish-black

101. Leaves grey-purplish to grey-green, plant height to 40 cm tall — **YAPARD**
101. Leaves purplish-black, plants height to 40 cm tall — 102
102. Leaves with a white marginal band — **Edge of Knight**
102. Leaves lacking a marginal band — 103
103. Flowers whitish tinged lavender, perianth 5–6 mm — 104
103. Flowers pinkish to mauve with medial purple stripe on tepals, perianth 3–5 mm — 105
104. Leaves 5–8 mm wide, 17–27.5 cm long, scapes 18–20 cm — **EBONY KNIGHT**
104. Leaves 2–3 mm wide, 14–18 cm long, scapes 9–10 cm — **Ebknizam**
105. Perianth 3–4 mm, plant height to 10 cm, flowers mauve — **Hosoba Koku Ryu**
105. Perianth 4–5 mm, plant height 15–32 cm, flowers pale pinkish-lavender — 106
106. Plant height 15–20 cm, scapes 7–21 cm — 107
106. Plant height 20–32 cm, scapes 18–26 cm — 108

(*Continued on next page*)

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107. Scapes 715 cm, peduncle 5–8 cm, foliar bracts 5–7 mm	**Nigra**
107. Scapes 15–21 cm, peduncle 10–18.5 cm, foliar bracts 8–13 mm	**Koku Ryu**
108. Perigone 2–3 mm, leaf veins 5–9, rachis 3–4 cm	**Black Beard**
108. Perigone 1–2 mm, leaf veins 9–13, rachis 4–7 cm	109
109. Perianth 3–4 mm, foliar bracts 6–9 mm	**Nigrescens**
109. Perianth 4–5 mm, foliar bracts 9–18 mm	**Arabicus**
Cultivars with leaf variegation of spots or blotches or yellow transverse bands	
110. Leaves 1–4 mm wide, veins 3–7 dwarf plants 8–17 cm tall	111
110. Leaves 4–15 mm wide, veins 11–25, small plants 20–40 cm tall	112
111. Transverse bands to 12 mm deep, juvenile leaves yellowish below middle	**Torafu**
111. Transverse blotches to 90 mm deep near leaf apex	**Spotted Tiger**
112. Leaves whitish, appearing bleeched, with green maculation or stripe	113
112. Leaves green with irregular yellow blotches or spots	114
113. Perigone to 0.5 mm, leaves whitish over most of blade, later green maculate above, clumper	**Okina**
113. Perigone 0.5–1 mm, leaves light green to whitish, later mottled below or green stripe, slow spreader	**Sno Cone**
114. Leaf yellow apically with green maculation, perigone to 0.5 mm	115
114. Leaf irregularly yellow transverse bands or blotches, perigone 0.5–1 mm	116
115. Leaf often yellowish below, rachis 5–9.5 cm, flowers lavender	**Tokai Rinpa**
115. Leaf often green below, rachis 3–5 cm, flowers bluish-purple	clone no. 7—**Yellow Splash**
116. Flowers purple, bands yellow to creme, some narrower 3–10 mm deep	**Hawk's Feather**
116. Flowers lavender, bands yellow, typically broader than 10 mm deep	**Sideswiped**
Dwarf cultivars (4–18 cm tall) with a marginal band	
117. Leaves 6–20 mm wide, scapes 16.5–27 cm, flowers upturned, purple	118
117. Leaves 1–6 mm wide, scapes 3–20 cm, flowers nodding, white, pink to lavender, to pale purple	119
118. Height 7–10 cm, rachis 6–10 cm, perigone lacking to 0.5 mm	**Blue Cushion**
118. Height 13–23 cm, rachis 9–15 cm, perigone lacking	**Gold Banded**
119. Small dwarf plant, height 4–13 cm tall	120
119. Large dwarf plant, height 13–18 cm tall	126
120. Leaves 2.5–8 cm long	121
120. Leaves 6–18 cm long	123
121. Flowers white, plant height 4–6 cm	**Tamaryu Nishiki**
121. Flowers pigmented, plant height 8–12 cm	122
122. Height 8–10 cm, flowers pale purple	**Tamaryu**
122. Height 10–12 cm, flowers pale pink	**Tamaryu No. 2**
123. Rachis 3–7.5 cm, perigone 1–2 mm	**Shiroshima Ryu**
123. Rachis 1–2.5 cm, perigone 0.5–1 mm	124
124. Leaves 15–23 cm long, scapes 6–9 cm	**Variegatus**
124. Leaves 6–13 cm long, scapes 3–5.5 cm	125
125. Flowers pale lavender, plant height 5–9.5 cm tall, marginal band creme to white	**Fuiri Gyoku Ryu**
125. Flowers pale pink, plant height 5–13 cm tall, marginal band white	**Nana**
126. Scapes 4–9 cm	127
126. Scapes 10.5–20 cm	128
127. Leaf marginal band whitish, flowers whitish tinged pale pink	**Comet**
127. Leaf marginal band creme to whitish, flowers whitish tinged pinkish-lavender	**Kigimafukiduma**
128. Leaf width 1–2 mm, flowers pale lavender, perianth 5–6 mm	**Sapphire Snow**
128. Leaf width 2–6 mm, flowers whitish, perianth 3–5 mm	129
129. Marginal band 0.2–0.8 mm wide, yellow, veins 11–17, yellow, flowers white	**Nana Variegata**
129. Marginal band 1–2 mm wide, yellow to creme-whitish, veins 5–9, flowers tinged pink	**Ryu No Higa**
Giant cultivars (40–90 cm tall) with a marginal band	
130. Scapes 29–81 cm, pedicels 6–10 mm, perigone 4–7 mm	**Vittatus**
130. Scapes 10–37 cm, pedicels 3–5 mm, perigone 1.5–3 mm	131
131. Rachis 17–21 cm, scape 17–37 cm, leaf width 7–11	**Variegated Evergreen Giant**
131. Rachis 6–7 cm, scape 10–13 cm, leaf width 4–6 mm	**Mexican Giant**
Small cultivars (20–40 cm tall) with a marginal band	
132. Leaves narrow, 3–8 mm wide	133
132. Leaves broader, to 23 mm wide	137
133. Flowers white, perigone 2 mm, rachis subequal peduncle	**Variegatus Intermedius**
133. Flowers pigmented, perigone 0.5–1 mm, rachis shorter than peduncle	134
134. Leaves 9–16 cm long, rachis 2.5–4 cm, foliar bracts 7–10 mm	**Haku Ryu Ko**
134. Leaves 21–40 cm long, rachis 5–17 cm, foliar bracts lacking	135
135. Rachis 3–7.5 cm, leaf veins 5–11, leaves shorter to 33 cm long	**Haku Ryu**
135. Rachis 8–17 cm, leaf veins 11–21, leaves longer to 40 cm long	136
136. Leaves 3–6 mm wide, veins 11–13, scapes 24–25 cm, rachis 8–8.5 cm	**Quail Garden**
136. Leaves 4–8 mm wide, veins 11–21, scapes 24–37 cm, rachis 9–17 cm	**Majestic Variegata**
137. Leaf marginal band white, flowers pink-lavender, perigone 1 mm, foliar bracts 7–40 mm	**Silver Dragon**
137. Leaf marginal band yellow/creme, flowers purple, perigone lacking to 0.5 mm, foliar bracts 5–17 mm	138
138. Peduncle 22–35 cm	139
138. Peduncle 10–24 cm	141
139. Flowers bluish-purple, foliar bracts lacking, plants smaller to 24 cm tall	**MARC ANTHONY**
139. Flowers purple, foliar bracts 5–10 mm, plants larger to 35 cm tall	140
140. Perigone lacking to 0.5 mm, rachis cockscombs lacking, leaf veins 15–25	**Variegata** (*L. muscari*)
140. Perigone 0.5–1 mm, rachis cockscombs infrequent, leaf veins 9–15	**Silvery Sunproof**
141. Rachis cockscombs common, plant height 34–39 cm tall	**John Burch**
141. Rachis cockscombs lacking, plant height 13–35 cm	142

(*Continued on next page*)

Table 2. (*Continued*) Key to liriopogon cultivars catagorized herein. The key is long, thus interspersed among the couplets are italicized morphological traits to aid those preferring to skip directly to that point in the key.

142. Perigone 0.5–1 mm, leaf width narrower, 4–8 mm wide — **Jeanerette**
142. Perigoe lacking to 0.5 mm, leaf width broader, (6-) 8–23 mm wide — 143
143. Rachis 9–15 mm, subequal peduncle at 10–16 mm — **Gold Banded**
143. Rachis 3–9 mm, much shorter than peduncle at 8–22 cm — 144
144. Plant height 13–20 cm — **Silvery Midget**
144. Plant height 20–35 cm — 145
145. Leaves 8–12 mm wide, scapes 21–30 cm, foliar bracts 6–7 mm — **Webber**
145. Leaves 6–18 mm wide, scapes 11–18 cm, foliar bracts lackinh — **Sunproof**

Giant cultivars (40–90 cm tall) with green leaves

146. Flowers nodding, stamens actinomorphic, subsessile — 147
146. Flowers upright, stamens zygomorphic, stalked — 148
147. Perianth 6–7 mm, plant height to 90 cm tall, leaves 45–79 cm — **CRYSTAL FALLS**
147. Perianth 5–6 mm, plant height to 60 cm, leaves 28–50 cm — **Ursula's Blue Fruit**
148. Leaf width 1–9 mm wide — 149
148. Leaf width 7–22 mm wide — 151
149. Rachis 5–6 mm, leaves 24–30 cm long, flowers pink — **LIRF ISABELLA**
149. Rachis 10–15 mm, leaves 40–63 cm long, flowers lavender to purple — 150
150. Leaves 6–7 mm wide, scapes 20–24 cm, flowers purple — **LIRJ JUST RIGHT**
150. Leaves 1–4 mm wide, scapes 40–62 cm, flowers lavender-lilaceous — **Porcupine**
151. Flowers purple-violet, scapes 15–36 cm — 152
151. Flowers lavender to bluish purple, scapes 50–127 cm — 153
152. Leaves 45–52 cm long, scapes 42–63 mm — **Love Portion No. 13 'EMERALD GODDESS**
152. Leaves 20–40 cm long, scapes 15–20 cm — **EXC-052**
153. Scapes 42–127 cm, rachis 27–41 cm — 154
153. Scapes 23–46 cm, rachis 8–18 cm — 155
154. Scape to 81 cm, flowers lavender, rachis with cockscombs & fasciation, — clone no. 5—**Garden Delights**
154. Scape to 127 cm, flowers bluish, rachis lacking cockscombs & fasciation, — clone no. 1 **ABG Form**
155. Leaf width 5–10 mm wide, flowers purple — **Lynn Lowery**
155. Leaf width 8–16 mm, flowers lavender purple to bluish-purple — 156
156. Plant height 36–50 cm, leaves shorter, 25–46 cm long — **Super Blue**
156. Plant height 45–75 cm, leaves longer, 40–80 cm — 157
157. Pedicels 3–4 mm, perigone 0.7–1 mm, leaves to 80 cm long — **Evergreen Giant**
157. Pedicels 4–6 mm, perigone 1–1.5 mm, leaves to 70 cm long — **Hartledge Giant**
157. Pedicels and perigone undocumented, leaves to 75 cm long — **Merton Jacobs SUPER GREEN GIANT**

Dwarf cultivars (2.5–20 cm tall) with green leaves

158. Leaves 6–19 cm wide, flowers upturned — 159
158. Leaves 1–3 mm wide, flowers nodding — 161
159. Rachis 4–6.5 cm, leaves twisting ½-1 turn, scapes 19–28 cm — **Curly Twist'**
159. Rachis 5–16 cm, leaves non-twisting, scapes 25–52 cm — 160
160. Peduncle 30–37 cm, scapes 43–52 cm, leaves 39–55 cm long, 9–16 mm wide — **Cheju**
160. Peduncle 16–26 cm, scapes 25–36 cm, leaves 18–40 cm long, 6–11 mm wide — **Blue Spire**
161. Scapes commonly lacking during season, plant height 2½–4 cm — 162
161. Scapes commonly present during season, plant height 4–20 cm — 163
162. Leaves 4–6 cm long, scarcely arching apically — **Gyoku Ryu Dwarf**
162. Leaves 3–4 cm long, arching outward apically — **Super Dwarf**
163. Leaves 30–39 cm long, flowers silvery-white — **Tuft Tuft Silver**
163. Leaves 2.5–18.5 cm long, flowers pinkish — 164
164. Scapes 7–10 cm, plant height 8–15 cm, leaves 12–18.5 cm long — **Intermedius**
164. Scapes 2–7 cm when present, plant height 2½–10 cm, leaves to 17 cm long — 165
165. Height 3–7 cm tall, leaves 2.5–8 cm long — **Bluebird**
165. Height 7–10 cm tall, leaves 4–12 to 17 cm long — 166
166. Flowers pinkish-lavender, leaves green, shorter, to 12 cm long — **Kyoto**
166. Flowers pale pinkish, leaves dark green, longer, to 15–17 cm long — 167
167. Foliar bracts 5–9 mm, flowers cremy-white tinged pink, rachis fascicles 5–7 — **Minor**
167. Foliar bracts lacking, flowers pale pink, rachis fascicles 3–5 — **Gyoku Ryu**

Small cultivars (18–40 cm tall) with green leaves

168. Leaves strongly curved near middle or apex — 169
168. Leaves erect, arching near apex to lax in winter — 171
169. Leaf blade strongly curved inward — **Curly Tops**
169. Leaf blade strongly arching outward and extending downward toward ground — 170
170. Plant height 30–40 cm — **Emerald Cascade**
170. Plantheight 22–25 cm — **Mop Top**
171. Foliar bracts (when present) from 5 to 16 mm long — 172
171. Foliar bracts gigantic, 20–210 mm long — 207
172. Flowers nodding, stamens actinomorphic, subsessile — 173
172. Flowers upright, stamens zygomorphic, stalked — 178
173. Leaves 3–12 mm wide, scapes 13–22 cm — 174
173. Leaves 1–3 mm, scapes 4.5–12.5 cm — 175
174. Leaves 15–22 cm long, 3–7 mm wide — **Leucanthus**
174. Leaves 12–15 cm long, 9–12 cm wide — **Platypus**
175. Plant height 30–45 cm tall, leaves 30–50 cm long — **Gracilis**
175. Plant height 15–5 cm tall, leaves 10–27 cm long — 176
176. Flowers mauve-lavender, perianth 3–4 mm, fascicles 9–12 — **Tuft Tuft Lavender**
176. Flowers pale pinkish-lavernder, perianth 2–3 mm, fascicles 2–7 — 177

(*Continued on next page*)

Table 2. (*Continued*) Key to liriopogon cultivars catagorized herein. The key is long, thus interspersed among the couplets are italicized morphological traits to aid those preferring to skip directly to that point in the key.

177. Rachis 0.5–1 cm, fascicles 2–3, peduncle 5–5.5 cm **Seoulitary Man**
177. Rachis 1.5–3 cm, fascicles 4–7, peduncle 8–11 cm **Aritaki**
178. Flowers white 179
178. Flowers pigmented 181
179. Rachis 5–7.5 cm, scapes 22–28 cm **Moore's White**
179. Rachis 8–18 cm, scapes (24-) 33–50 cm 180
180. Plant height 15–24 cm, scapes 24–38 cm, rachis 8–13.5 cm, foliar bracts lacking **Monroe's White**
180. Plant height 25–40 cm, scapes 34–50 cm, rachis 12–18 cm, foliar bracts 6–8 mm **Traebert White**
181. Rachis 2–7.5 cm long 182
181. Rachis (5-) 7–24 cm long 187
182. Flowers dark purple, leaves broader, to 18 mm wide, perigone lacking to 0.5 mm **Purple Bouquet**
182. Flowers lavender to purplish-lavender, leaves 2–10 mm wide, perigone 0.5–1 mm 183
183. Rachis fascicles 8–15, perianth 2.5–3 mm 184
183. Rachis fascicles 20–40, perianth 3–4 mm 185
184. Plant height 18–25cm tall, scapes 6–22 cm, leaf veins 5–11 **Majestic** (*L. spicata*)
184. Plant height 24–40 cm tall, scapes 21–30 cm, leaf veins 11–17 **Miniature**
185. Leaves light green, broader, 7–10 mm wide, 7–9 **Ingwersen**
185. Leaves green, narrower, 2–8 mm wide, veins 9–13 186
186. Flowers bluish-lavender, peduncles 17–23 cm, foliar bracts lacking **New Orleans**
186. Flowers lavender, peduncles 12–17 cm, foliar bracts 6–14 mm **Franklin Mint**
187. Perigone lacking to 0.5 mm 188
187. Perigone 0.5–1 mm 199
188. Flowers light pink to pinkish-lavender to lilaceous 189
188. Flowers bluish-purple to light purple to dark purple 190
189. Foliar bracts 6–11 mm, flowers lilaceous, leaves broader 5–19 mm **Lilac Beauty**
189. Foliar bracts 7–210 mm, flowers light pink to pinkish-lavender, leaves narrower 6–13 mm **Samantha**
190. Leaves broader, 14–26 mm wide, rachis longer, to 23 cm and sbequal to peduncle **Webster Wideleaf**
190. Leaves narrower, 5–19 mm, rachis conspicuously shorter, to 16 cm and 1/3 to ½ of peduncle 191
191. Flowers dark purple 192
191. Flowers bluish-purple to light purple 194
192. Fascicles 17–25, foliar bracts lacking, leaf width 6–18 mm **Sheffield**
192. Fascicles 30–50, foliar bracts present, leaf width 7–14 mm 193
193. Foliar bracts 6–8 mm, fascicles 40–50, leaf width broader 7–14 mm **Big Um CLEOPATRA**
193. Foliar bracts 8–200 mm, fascicles 30–40, leaf width narrower 7–10 mm **New Wonder**
194. Leaf width 4–8 mm, flowers light purple **Rocket**
194. Leaf width broader to 15 mm wide, flowers bluish-purple 195
195. Peduncles 12–18 cm 196
195. Peduncles 16–29 cm 197
196. Fascicles 20–25, rachis 7–11 cm, foliar bracts 6–7 mm **Border Gem**
196. Fascicles 25–40, rachis 6–18 mm, foliar bracts 6–18 mm **Majestic** (*L. muscari*)
197. Plant height 30–47 cm tall, foliar bracts lacking, flowers light purple **Blue Giant**
197. Plant height 15–30 cm tall, foliar bracts present, flowers bluish-purple 198
198. Foliar bracts 6–7 mm, leaves slightly shorter to 44 cm, fascicles 30–40 **Big Blue**
198. Foliar bracts 7–50 mm, leaves longer to 51 cm, fascicles 29–51 **Grandiflora**
199. Flowers purple to dark purple 200
199. Flowers pinkish-lavender to bluish purple to light purple 201
200. Plant height 17–26 cm tall, leaves 21–30 cm long, scapes 21–30 cm, rachis 8–13 cm **Green Midget**
200. Plant height 30–40 cm tall, leaves 28–46 cm long, scapes 24–45 cm, rachis to 23 cm **Densiflora**
201. Leaves dark green, flowers pinkish-lavender **Superba**
201. Leaves green, flowers bluish-purple 202
202. Peduncles 15.5–19 cm, leaf width 5–6 mm **Supreme**
202. Peduncles 17–33 cm, leaves broader, to 14 mm wide 203
203. Leaves shorter, 23–31 cm, **Snow Dragon**
203. Leaves longer, 28–48 cm 204
204. Foliar bracts lacking, leaves 3–9 mm wide - narrower, flowers bluish-purple 205
204. Foliar bracts present, leaves 5–12 mm wide - broader, flowers lavender-bluish purple 206
205. Fascicles 23–27, leaf veins 5–7 **Regal**
205. Fascicles 25–35, leaf veins 11–15 **Tidwell Big Blue**
206. Foliar bracts 8–31 mm, leaves longer to 47 cm, veins 11–19 **Wonder Evergreen**
206. Foliar bracts 6–10 mm, leaves shorter to 41 cm, veins 9–13 **Majestic** (*L. exiliflora*)

Small cultivars (18–40 cm tall) with green leaves and giant foliar bracts (20–210 mm)

207. Foliar bracts gigantic, 50–210 mm long 208
207. Foliar bracts 6–50 mm long 210
208. Larger inflorescence, rachis 7–23.5 cm, scapes to 45 cm, flowers purple to dark purple **Densiflora**
208. Smaller inflorescences, rachis 5–12 cm, scapes to 36 cm, flowers lighter hue 209
209. Flowers light pink to pinkish-lavender, perigone 0.5–1 mm **Samantha**
209. Flowers bluish-purple, perigone lacking **New Wonder**
210. Leaf apices incurved **Curly Top**
210. Leaf apices arching outward, not incurved 211
211. Rachis 2–5.5 cm, leaf width 3–9 mm, height 18–25 cm tall, perianth 2.5–3 mm **Majestic** (*L. spicata*)
211. Rachis 6–23.5 cm, leaf width broader 6–21 cm, height taller to 30–42 cm, perianth 3–4 mm 212
212. Flowers pinkish-lavender 213
212. Flowers bluish-lavender to bluish-purple to purple 214
213. Perigone to 0.5 mm, foliar bracts 7–210 mm, rachis 5–12 cm, leaf width narrower 6–13 mm **Samantha**

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Table 2. (*Continued*) Key to liriopogon cultivars catagorized herein. The key is long, thus interspersed among the couplets are italicized morphological traits to aid those preferring to skip directly to that point in the key.

213. Perigone 0.5–1.2 mm, foliar bracts 10–33 mm, rachis 6–17 cm, leaf width broader 5–20 mm	**Superba**
214. Plant height 26–30 cm tall, flowers bluish-lavender	**Wonder Evergreen**
214. Plant height 17–40 cm tall, flowers bluish-purple to purple	215
215. Flowers dark purple, perigone 0.5–1 mm, rachis longer, to 23.5 cm	**Densiflora**
215. Flowers bluish-purple, perigone lacking to 0.5 mm, rachis shorter, 9–17 mm	216
216. Leaves broader, to 21 mm wide, plant height 30–33 cm tall, peduncles shorter 12–23 cm	**Royal Purple**
216. Leaves narrower, to 15 mm wide, plant height to 42 cm tall, peduncles longer, 16–33 cm	217
217. Rachis 7–13 cm, foliar bracts to 50 mm, perigone to 0.5 mm	**Grandiflora**
217. Rachis 9–17 cm, foliar bracts to 200 mm, perigone lacking	**New Wonder**

Phenology: June–July. *Origin*: Carroll Gardens. *Source*: as *L. spicata*, Carroll Gardens. *Accession*: 86–015. *Observations*: Similar to 'Monroe's White', but a greater spreader and distinct with foliar bracts, and some cockscombs and fasciation.

'Albus'. Height 10″ (= 25 cm). Flower color white—typical violet hue. *Source*: As *O. japonicus* (Hatch, 2011b). *Observations*: Data from other sources lacking. Treated herein as invalid; an obscure clone unable to match with other selections of this species.

'Albus'. *Source*: As *O. planiscapus*, Plant Delights Nursery, obtained in Dec. 1995 from Apple Court. *Accession*: 02–270. *Observations*: Equivalent to 13–367 obtained from this nursery with updated name = **'Leucantheus'**.

AMETHYST ('LIRTP'). Creeping groundcover forming an upright clump to 40 cm tall × 40 cm wide, and to an average of 75 × 85 cm with age. Leaves arching near middle to slightly below middle, weeping with age, yellowish-green, 25–35 cm long, 5–9 mm wide. Scapes displayed above foliage, 25–36.5 cm; peduncle yellow-green becoming grayish-green; rachis purple, 10–15 cm; fascicles loose; bracts yellow-green; pedicels violet, 1–5 mm; buds violet. Flowers upright, purple, 7 mm diameter; stamens zygomorphic, stalked. (*L. exiliflora*).

Phenology: December–February, Sydney, Australia. *Origin*: Seedling was selected from open pollinated *L. muscari* 'Big Blue' in 2002 at a nursery in New South Wales, Australia; selected as 'LIRTP' in 2005 and granted plant breeders' rights on 27 Mar. 2006 under Application No. 2006/036 with the Australian Plant Breeders' Rights Office. *Source*: US PP no. 20623 issued 5 Jan. 2010 (USPP, 2012). *Notes*: Selected because of its height and inflorescence length combined with narrow leaf width, dense foliage, and a purple flower color (USPP, 2012). A compact *Liriope* with dark green foliage that contrasts with stunning deep purple flowers well above the foliage (Ozbreed, 2012). *Observations*: Specimens were not examined in this study. Growth form suggests *L. exiliflora*, not *L. muscari*.

'Arabicus'. Creeping groundcover spreading by underground rhizomes 2–15 cm long. Leaves (12-) 20–35 cm long, 3–5 mm wide, green becoming purplish-black, hyaline sheaths 2–3 cm, veins 9–11 cm. Scapes 19–26 cm; peduncle flattened, green to purplish-black, (12) 15–19 cm, 1–1.5 mm wide; rachis 4–7 mm, green to purplish-black, lowermost internodes 2–3 mm, fascicles 6–9; bracts 4–8 mm, foliar bracts 9–18 mm; pedicels black, 2–3 mm, buds 2 mm. Flowers nodding, pale pink with broad medial lavender vein; perianth 4–5 mm, perigone maroon, 1–2 mm. Fruits green becoming black, 4–5 mm diameter on pedicels of 4–5 mm (*O. planiscapus*).

Phenology: Mid-May–July, July. *Origin*: *O. arabicus* Hort. (Graf, 1985). *Source*: Kurt Blumel Inc., JCRA, Plant Delights Nursery. *Accession*: 90–151, 02–267, 12–352. *Observations*: Young green leaves were eaten by rabbits. Morphologically similar to 'Nigrescens' and sometimes placed in synonymy, but differs by a larger perianth of pale pink hue.

'Argenteomarginatus' (some 'Aztec', misidentified *O. japonicus* 'Variegatus'). Groundcover forming tufts 40–45 cm tall, spreading to 40–45 cm. Leaves erect, arching, pale to deep green, variegated, 33–42 cm long, 4–7 mm wide, veins 9–11; variegation with silvery-white marginal band and stripes. Scapes 19–20 cm; peduncle 9–10 cm; rachis 9–10.5 cm, open, internodes 7–17, fascicles 25–28; bracts 4–7 mm, foliar bracts 9; pedicels 4 mm; buds white, 3 mm. Flowers white, nodding; perianth 3 mm, perigone 2 mm. Fruit not observed (*O. intermedius*).

Phenology: Summer. *Sources*: As *O. intermedius*, Graf (1985), LifeStyle Home (2013a), Plant Lust Nurseries (2013b), as *O. japonicus*, Mountain Crops Improvement Laboratory (from Carolina Nurseries). *Accession*: 2010–053. *Observation*: A slight variation of 'Grandiflora Variegata'. Species historically misidentified as *L. muscari* or *O. japonicus*, more recently with *O. jaburan*.

'Argenteovittatus' ('Argenteovittatus', 'Javanensis', 'Vittatus'). Groundcover forming clumps 40–90 cm tall × 90–150 cm spread. Leaves green, variegated, (30–) 40–90 cm long, 9–17 mm wide, veins 19–25; variegation with yellowish marginal bands, becoming creme to whitish with age, and sparse longitudinal stripes. Scapes 29–81 cm; peduncles flat, light green, 21–29 (–67) cm; rachis greenish-white to whitish, 8–14 (–20) cm, fascicles 30–40, open, lower internodes 4–13 (–21) mm; bracts 7–12 mm, foliar bracts (25–) 30–77 mm; pedicels 6–10 mm; buds 3–6 mm. Flowers white, nodding; perianth 7–9 mm, perigone 4–7 mm; filaments subsessile, actinomorphic. Fruit abort, not observed (*O. jaburan*).

Phenology: July–August. *Origin*: Unknown. *Sources:* As *O. jaburan* 'Vittatus', Mountain Crop Improvement Laboratory 2010–045, Plant Delights Nursery (from Duncan and Davies, Aug. 1997). *Accessions*: 02–281, 12–333. *Notes:* Alpine Garden Society (2011) cited that *O. jaburan* 'Argenteovittatus', 'Aureovariegatus', 'Javanensis', 'Variegatus' and 'Vittatus' have leaves striped cream, yellow, or white. Variable variegated foliage makes it difficult to distinguish one cultivar from another. B&T World Seeds (2013) cited synonyms (alternative names) for *O. jaburan* 'Vittatus' as *Ophiopogon argenteo-vittatus, Ophiopogon jaburan* 'Variegata', and *O. javanensis*. *Observations*: We examined plants of 'Variegata' and 'Vittatus' in this study, but were unable to obtain plants labeled with the other names. These two cultivars were similar morphologically and possibly should be combined. However, 'Vittatus' had more fascicles of flowers and leaves with yellow stripes soon fading to creme or whitish-silver with age. Therefore, we are treating these as two distinct selections until further research reaches a different conclusion.

'Ariaka-janshige' ('Ariake-janshiga'). *Notes*: Creeping groundcover to 25 cm tall, spreading widely with daughter plants away from parent bib. Leaves green, variegated with yellow margin and stripes fading quickly to silvery-white. Scapes among to overtopping leaves. Flowers pale pink. Nesom (2010) cited 'Ariataka-janshige' (v = Silvery Sunproof?). Photos of cultivar no. 8a,b (Phytoneuron 2013). Hatch (2011b) cited variegation as golden yellow. *Observations*: Plants with this name were unattainable for this study. Photos indicate silvery-white foliage, and appear similar to 'Silver Dragon'. This may be the Japanese name. = **'Silver Dragon'**.

'Aritaki' ('Aritake'). Creeping groundcover 10–25 cm tall, daughter plants 4–13 cm away from parent. Leaves erect, arching outward apically, dark green, 10–26.5 cm long, 1–3 mm wide, veins 3–7 (9), hyaline sheaths 1.5–3 cm. Scapes inconspicuous among leaves, (4.5–) 7.5–12.5 cm; peduncles light green, (4–) 8–11 cm; rachis arching outward, whitish, 1.5–3 mm, fascicles 4–7, open, internodes 2–5 mm; bracts 1–4 mm, foliar bracts 5.5–9 mm; pedicels 1–2 mm; buds whitish-lavender. Flowers nodding, pale pinkish-lavender; perianth 2–3 mm, perigone 1 mm; anthers actinomorphic, subsessile. Fruit blue, not observed (*O. japonicus* var. *caespitosus*).

Phenology: June–July. *Origin*: Named for Tadahiko Aritaki who traveled and collected

plants throughout Asia; Aritaki Arboretum (private), Saitama, Japan. *Sources*: As *O. japonicus*, JC Raulston Arboretum, Plant Delights Nursery (from JC Raulston Arboretum, Sept. 1997). *Accessions*: 01–259, 02–278, 12–333. *Notes*: Spreading carpet of green grass premowed, larger dwarf than many; recommended as a potted plant for showy flowers and porcelin blue fruit among the narrow leaves (Quaken Grass, 2013). *Observations*: Avent noted short rhizomes, slowly spreading, variegation fades in heat. Similar to 'Seoulitary Man' that has larger, darker pigmented flowers on shorter peduncles.

'Aureovariegatus' (*O. jaburan* 'Variegata', 'Korean Giant', 'Korean Variegata'). Groundcover forming clumps 13–37 cm tall. Leaves variegated, 18–27 (–56) cm long, 8–16 mm wide, veins 7–13, juvenile leaves yellowish becoming green with yellow marginal band 1–3 mm wide and medial vertical stripes. Scapes (32–) 49–62.5 cm; peduncles green, (22–) 43–49 cm; rachis arching outward, light green to white, 10–16 cm, fascicles 15–25; bracts green with whitish margins, 6–13 mm, foliar bracts 20–48 cm; pedicels white, 5–11 mm long, buds white, 4–6 mm. Flowers white, nodding; perianth 6–7 mm, perigone 4–7 mm; stamens actinomorphic, subsessile. Fruit not observed. (*O jaburan*).

Phenology: July–August. *Origin*: Hans Simon, Gärtnerischer Pfanzenbau, from Korea. *Source*: As *O. jaburan* 'Variegata', JC Raulson Arboretum 88–0089 (from Korea via Hans Simon). *Accession*: 88–097. *Notes*: Alpine Garden Society (2011) cited 'Aureovariegatus' and B&T World Seeds (2013) cited *O. jaburan* 'Variegata' as synonymous with 'Argenteovittatus'. *Observations*: Although similar morphologically with 'Argenteovittatus', this selection had fewer fascicles of flowers and leaves with fewer raised leaf veins and yellow striped with older leaves becoming lighter yellow variegated, but not creme to silvery with age. Rarely miscited as a cultivar Korean Variegata based on a descriptive statement with Korean as first term.

'Aztec'. Treated herein as an invalid name, a confused name applied to several clones of different species in both genera, clones with both green and variegated leaves; cultivar name derived from the common name aztec grass that sometimes became labeled or marketed as 'Aztec'.

1) *Source*: Mountain Crop Improvement Laboratory (received as *L. spicata* 'Aztec', corrected to *O. intermedius*). *Voucher*: Lattier 105. Leaves green, variegated yellow stripes and margin. = *O. intermedius.*
2) *Source*: As aztec grass, Micro Macro International. : 94–244. Leaves light green, variegated with whitish stripes and margin. = *O. intermedius* **'Variegated Evergreen Giant'.**
3) *Source*: As aztec grass, *O. jaburan*, JC Raulston Arboretum. *Accession*: 94–245. Leaves green with white margins. = *O. jaburan.*

Table 3. Inventory of vouchers of selected liriopogon cultivers as Lectotypic Standards. Lectotypic indicates the type standard was selected by a later author (Fantz herein), not the originator of the cultivar name. Lectotypic Standard vouchers will be deposited in the North Carolina State University Herbarium (NCSC), Raleigh, NC.

Cultivar	Voucher	Accession
ABG form	Fantz 9812	13–369
Big Blue	Fantz 4367	87–057A
Big Blue Riegel	Fantz 5964	87–032F
Blackbeard	Fantz 9781	13–360
Bluebird	Fantz 9629	12–323
Blue Cushion	Fantz 5507	87–038B
Blue Giant	Fantz 9686	12–357
Blue Spire	Fantz 5328	87–033A
Border Gem	Fantz 5805	87–026A
C.T. Tanner	Fantz 5491	89–115C
Christmas Tree	Fantz 6482	87–037A
Comet	Fantz 9807	12–336
Crested White	Fantz 6432	93–190A
Curly Top	Fantz 6635	01–258
Curly Twist	Fantz 5544	86–027B
Densiflora	Fantz 4370	87–059
Dwarf	Fantz 5646	93–240
Early Bloomer	Fantz 9774	12–305
Eleven-O-Three	Hume & Ward s.n.	FLAS 14156
EvergreenGiant	Fantz 5783	87–060B
Franklin Mint	Fantz 6269	90–147D
Fuiri Goyku Ryu	Fantz 9619	12–339
Garden Delights	Fantz 9645	12–371
Gold Banded	Fantz 4383	87–061
Gold Leaf	Fantz 9791	13–361
Gracilis	Fantz 9822	02–272
Grandiflora	Fantz 5216	87–045A
Grandiflora Variegata	Fantz 6064	01–264A
Grape Fizz	Fantz 9830	12–332
Green Midget	Fantz 5197	87–062B
Haku Ryu Ko	Fantz 5220	90–133A
Haku Ryu	Fantz 6377	90–131A
Hartledge Giant	Fantz 5548	87–091A
Hawk's Feather	Fantz 6632	010255
Ingwersen	Fantz 6126	88–094A
Intermedius	Fantz 5442	89–098A
Jeanerette	Fantz 6321	89–120G
Kigimafakiduma	Fantz 4363	87–077B
Koku Ryu	Fantz 4354	87–093
Kyoto	Fantz 6367	91–153D
Kyoto Dwarf	Fantz 5258	89–109
Little Tabby	Fantz 6886	02–266
Majestic Exiliflra	Fantz 5003	89–110G
Majestic Muscari	Fantz 6019	87–041B
Majestic Spicata	Fantz 5482	86–010D
Majestic Variegated	Fantz 6094	87–051B
Miniature	Fantz 5349	87–114E
Minor	Fantz 5923	88–099A
Monroe White	Fantz 4358	87–066A
Moore's White	Fantz 6158	89–125
Nana	Fantz 5446	87–079G
Nana Variegata	Fantz 7415	13–366
New Orleans	Fantz 6044	90–152D
New Wonder	Fantz 5103	86–023A
Nigra	Fantz 6202	87–054B
Nigrescens	Fantz 4373	87–080A
Okina	Fantz 6887	02–260
Peedee Ingot	Fantz 8891	13–369
Porcupine	Fantz 9657	12–322
Purple Bouquet	Fantz 5804	87–048B
Quail Garden	Lattier 121	
Regal	Fantz 5064	86–007
Rocket	Fantz 6538	91–171A
Royal Purple	Fantz 6085	87–067A
Ryu No Higa'	Fantz 6889	02–268
Samantha	Fantz 6161	89–106B
Sapphire Snow	Fantz 9784	13–362
Seoulitary Man	Lattier 119	
Sheffield	Fantz 5059	87–039A
Shiroshima Ryu	Fantz 5924	86–017B
Sideswiped	Fantz 9833	12–336

(*Continued on next page*)

Table 3. (*Continued*) Inventory of vouchers of selected liriopogon cultivers as Lectotypic Standards. Lectotypic indicates the type standard was selected by a later author (Fantz herein), not the originator of the cultivar name. Lectotypic Standard vouchers will be deposited in the North Carolina State University Herbarium (NCSC), Raleigh, NC.

Cultivar	Voucher	Accession
Silver Dragon	Fantz 4362	87–076
Silvery Midget	Fantz 4360	87–047A
Silvery Sunproof	Fantz 6443	87–070B
Sno Cone	Fantz 9829	12–237
Snow Dragon	Fantz 9860	12–358
Sunproof	Fantz 5847	85–003A
Super Dwarf	Fantz 6892	01–261
Superbera	Fantz 5253	87–081C
Tokai Rinpa	Fantz 9821	13–372
Tama Ryu Nishiki	Fantz 9617	12–347
Tidwell Big Blue	Fantz 5010	87–052B
Tokai Rinpa	Fantz 9677	12–328
Torafu	Fantz 5426	91–165A
Traebert White	Fantz 4389	87–031B
Twisted Variegata	Lattier 106	
Variegata Alba	Fantz 5375	92–176A
Variegated Evergreen Giant	Fantz 5105	90–138A
Variegated White	Fantz 5046	87–072C
Variegatus	Fantz 5452	90–173F
White on White	Fantz 5543	90–143B
Wonder Evergreen	Fantz 6481	87–034A
Wuban Variegata	Lattier 213	2010–004
Yellow Splash	Fantz 9819	13–365
Webber	Fantz 6164	91–169C
Webster Wideleaf	Fantz 5958	87–075B

4) *Source*: As aztec grass, border grass, K-Mart, Clearwater FL. *Accession*: 96–247. Leaves green with whitish stripes. = *O. intermedius* **'Variegated Evergreen Giant'**.

5) *Source*: As green aztec grass, Horticultural Products, Inc. Accession: 96–251. Leaves green, nonvariegated. = *L. gigantea.*

6) *Source*: As green aztec grass (*Ophiopogon)*, Horticultural Products, Inc. Accession: 96–252. Leaves green, nonvariegated. = *L. exiliflora.*

'Aztec Gold'. Groundcover to 40 cm tall by 60 cm diameter. Leaves erect, arching above, long and narrow, green variegated, variegation with thick pale yellow bands. Flowers white. Fruit black.

Phenology: Midsummer to midfall, fall. *Origin*: Unknown. *Sources*: As *Liriope* 'Aztec Gold' (Gardenaway, 2014); as *L. muscari* 'Aztec Gold' (Learn2Grow, 2014a). *Notes*: 'Aztec Gold' is a perennial commonly known as lily turf or border grass, grows slowly and features showy white blooms (Gardenaway, 2014). White spikes of flowers and green leaves edged with thick pale yellow bands (Learn2Grow, 2014a). *Observations*: Limited qualitative description makes it difficult to compare with other white-flowered, variegated selections.

'Aztec Prince'. Leaves arching near base, green, variegated; variegation with yellowish stripes and marginal band, fading to silvery/whitish bands and stripes with age. Scapes among leaves; peduncle flat, blackish; rachis black, strongly arching, fascicles 5–6. Flowers white, nodding; perigone ca 1–2 mm. (*O. planiscapus*).

Source: Facebook (2013), including habit photos with leaves and scapes. *Notes*: Cited as a new cultivar soon to be released, more attractive than boring 'Nigrescens' and faster growing (Facebook, 2013). *Observations*: No sample plants observed for obtaining quantitative measurements. 'Nigrescens' has purplish-black leaves and lacks variegation. Possibly the green version of 'Edge of Knight' exhibits green and purplish-black variegated leaves. (*O. planiscapus*).

'Baby Leopard'. *Source*: Plant Delights Nursery, obtained from Michael Vaughn in 2012 as *Ophiopogon* sp. 'Baby Leopard'. *Observations*: Plant dead (?), not found as of July 2013. Not observed for data collection.

BALI STRIPE. Creeping groundcover 20–25 cm tall, spreading to 20–25 cm. Leaves dark green variegated with narrow silver to creme stripes. Flowers mauve in color.

Phenology: Unknown. *Origin*: Japan. *Sources*: As *O. japonicus*, Hatch (2011b), Landsdale Plants (2013), LifeStyle Home (2013b), Logan's Nursery (2013). *Notes*: Bali Grass (common name is Bali Striped) is a striking form of the popular mondo grass with variegated silver, cream, and green striped leaves and a clumping habit, a soft-wooded perennial, originally from Japan (Landsdale Plants, 2013). *Observations*: Plants were not examined in this study. Appears to be distributed in Australia, not in the United States, although cited by Hatch (2011b). Qualitative description makes it difficult to segregate this selection from various clones of variegated *O. japonicus*.

'Big Blue' ('Big Blue Riegel', 'Original Big Blue'). Clumping groundcover 15–30 cm tall, 40–45 cm diameter. Leaves erect, arching near apex to near middle with age, green, 25–44 cm long, 5–13 mm wide, veins 11–19, weakly ribbed above. Scapes among foliage, 22–36 cm; peduncles green tinged purple to purplish, compressed-terete, 16–28 cm long; rachis 7.5–16 cm, rarely with lateral apical branch to 7 mm long, fascicles 30–50, crowded, internodes 2–8 mm; bracts 2–4 mm, foliar bracts 6–7 mm; pedicels lavender, 2–4 mm; buds bluish-purple, 2–4 mm. Flowers upturned, bluish-purple to purple; perianth 4–4.5 mm, perigone lacking to 0.5 mm; stamens zygomorphic, stalked. Fruits are rare, commonly absent, aborted, black, 6–7 mm diameter. *(L. muscari*).

Phenology: July–August. *Origin*: Riegel Nursery. *Source*: Clarence Landis (from Riegel Nursery), Evergreen Nursery. *Accessions*: 87–032, 87–057. *Observations*: Confusion over 'Big Blue' clumpers vs. creepers has led to names 'Big Blue Riegel' and 'Original Big Blue' to denote the 'Big Blue' from Riegal Nursery. This selection is distinguished from imposters by scapes near foliage apices, most fruit aborting leaving pedicillate dichasia on racemes, clumping continuously with age. One can use a field technique, separate leaves with your hands and it will be difficult to observe patches of bare soil (Fantz, 2009; Nesom, 2010).

'Big Blue'. Weakly creeping groundcover 30–38 cm tall forming loose clump 20–30 cm diameter in first couple of years, then daughter plants 7–17 cm away from parent, becoming invasive after 5 years. Leaves erect, green, weakly glaucous below, (24–) 30–48 cm long, (4–) 8–14 mm wide, veins 11–17. Scapes numerous, among foliage apex to overtopping foliage, 28–43 cm long; peduncle compressed-terete, greenish-brown weakly tinged purplish, 18–33 cm; rachis lavender-green to whitish above, 9–17 cm, rarely with basal lateral branch 3–7 cm long, occasionally slightly fasciated, 2–3 branches 0.5–1-mm long fascicles 30–38, loose, lowermost internodes 5–20 mm; bracts 2–4 mm, foliar bracts 6–8 mm; pedicels 2–4 mm; buds lavender with purplish hue, 2–3 mm. Flowers upturned, lavender to bluish-purple; perianth 4 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit abundant, green becoming black, 1–5 per pedicel, 6–8 mm diameter. (*L. exiliflora*).

Phenology: June–August; mid-August–October, persisting through winter. *Origin*: Misidentified clone, an imposter 'Big Blue'. *Sources*: As *L. muscari*, Kurt Blumel, LA Nursery. *Accessions*: 87–053, 89–108. *Notes*: Hume (1961) reported that 'Big Blue' is the common garden name for typical *L. muscari*, and from seeds that a considerable number of garden selections have arisen. *Observations*: Forms wide clumps in first few years with daughter plants on short underground runners, then spreading with age. Scapes produce abundant fruit persisting through winter. A good field technique is to separate the leaves with your hands, observing patches of bare soil between parent and daughter plants. Treated here as invalid name, imposters of Riegel's 'Big Blue'. These imposters

are similar to 'Tidwell Big Blue', the first known name for these taxa. = **'Tidwell Big Blue'**

'Big Green' *Source*: Isaacson (1989), no. 50281, p. 20. Invalid name lacking data.

'Bigun' Groundcover forming clumps 25–30 cm tall, spreading 35–47 cm diameter, daughter plants 2–4 cm from parent. Leaves dark green, 28–42 cm long, 5–10 mm wide, veins 13–19. Scapes 22–36 cm; peduncle compressed-terete, green, 15–21.5 (–27) cm; rachis (6.5–) 9–14 cm, fascicles 30–45; bracts 2–3 mm, foliar bracts 6–7 mm; pedicels 2–3 mm; buds 2–3 mm, light purple. Flowers upturned, bluish-purple; perinath 3–4 mm, perigone lacking to 0.5 mm; stamens zygomorphic, stalked. Fruit set may be heavy, not observed in study. (*L. muscari*).

Phenology: August. *Origin*: Open-pollination seedling of 'Big Blue' discovered by James Bryan Berry, June 1996, Loxley AL; US PP 15474, issued 12 Apr. 2004 as *L. muscari* 'Bigun' (Plant Genius 2011). *Source*s: JC Raulston Arbotretum 03–1570, Mountain Crop Improvement Laboratory 2007–183, US PP 15474. *Accessions*: Fantz 9695, Lattier 217. *Notes*: Similar to 'Big Blue', but blooms 7–10 d earlier, and has a wider leaf that is slightly twisted (Plant Genius, 2011). PP 15474 cited 'Bigun' as distinct by wide, slightly twisted leaves, dark green and dark violet flowers; tolerates wind, salt spray, and drought (Plant Genius 2011). *Observations*: Source plants studied had bluish-purple flowers, but twisting in leaves not observed. PP 17574, marketed more commonly as **CLEOPATRA**.

'Black Beard'. Creeping groundcover 20–30 cm tall, daughter plants away from parents. Leaves erect, arching 1/3 from apex, purplish-black, 20–34 cm long, 3–6 mm wide, veins 5–9; juvenile foliage green. Scapes conspicuous, overtopping leaves, 18–21 cm: peduncle flat, green to purplish-black, 14–18 cm; rachis erect with weak arching outward, 3–4 cm, fascicles 6–8, open; bracts 3–4 mm, foliar bracts 8–12 mm; pedicels 2–3 mm, buds 2–3 mm. Flowers nodding, pale pinkish-lavender, 7 mm diameter; perianth 4 mm, perigone 2–3 mm; stamens actinomorphic, subsessile. Fruit not observed. (*O. planiscapus*).

Phenology: June. *Origin*: A selection from a breeding program using *O. planiscapus* 'Nigrescens' made by Steve Yandall of Rainbow's End Nursery, Cornwall, England (San Marcus Growers, 2013). *Source*: Plant Delights Nursery (from Pacific Plug and Liner in 2011). *Accession*: 13–360. *Notes*: A vigorous growth rate (San Marcos Growers, 2013a). From the United Kingdom's Steve Yandell comes a new selection of *O. planiscapus* that forms a large 1′ tall clump, remaining tighter and growing faster than the spreading *Ophiopogon* 'Arabicus'. We have not grown this long enough to confirm all of Steve's claims. Unfortunately, it was patented under the nonsensical name of Ophiopogon 'Yapard'. (Plant Delights Nursery, 2013c). *Observations*: Plants observed in study differ from YAPARD by a smaller habit, smaller flowers, smaller rachis, and leaves more purplish-black, less grayish; thus, segregated in our key. 'Black Beard' is similar to 'Nigrescens', differing by larger flowers and longer foliar bracts.

'Black Dragon'. Treated as invalid name as it is the the vernacular name associated with this cultivar. *Accession*: 96–243. *Source*: Micro Macro International = **'Nigrescens'**.

'Black Knight' ('Black Night'). Described as a superior uniform clone that is more "blackish." Regarded as an invalid name variation of **EBONY KNIGHT**, possibly used to avoid trademark issues.

'Bluebird' (some *O. japonicus* dwarfs). Dwarf tufted groundcover forming dense mounds of adjacent plants, 3–7 cm tall; rhizomes 1–7 mm with daughter plants adjacent to parent plants. Leaves dark green, 2.5–8 cm long, arching outward apically, 1–3 mm wide, veins 5–11. Scapes hidden, 4–5 cm; peduncles flat, green, 3–3.5 cm; rachis arching outward, green, 1.2–1.6 cm long, fascicles 4–5, open; bracts 1.5–3 mm, foliar bracts not observed; pedicels 1–2 mm. Flowers nodding, post bloom. (*O. japonicus*).

Phenology: Vegetative only. *Origin*: Bluebird Nursery, Clarkston NE, 1970s (cannot remember source). Named by Plant Delights Nursery. *Source*: Plant Delights Nursery (unnamed clone from Bluebird Nursery, Dec. 1998; dwarf from Japan via Darrel Probst, Nov. 2001). *Accessions*: 01–265, 02–265, 12–323, 12–329, 12–335, 12–337. *Observations*: Extreme dwarf mounding groundcover with dark green foliage. Individual plants resemble a tree in outline with a spreading canopy. A more compact, denser, and smaller clone of 'Gyoku Ryu'. Possibly 'Super Dwarf' should be included here also.

'Blue Cushion'. Caespitose groundcover, 7–10 cm tall, ca 30 cm spread. Leaves spreading-arching to ground, 21–32 (–45) cm long, 8–20 mm wide, green, variegated, veins 9–21, variegation yellow marginal band 0.5–2 mm wide. Scapes 19–27 cm; peduncle green becoming purplish, quadrangular-terete, striate, 10–21 cm; rachis lavender, 6–10 cm long, fascicles 25–50, dense, internodes 1–6 mm long, lowermost 15 mm long; bracts purplish-green, 2–4 mm, foliar bracts 6–12 mm long, 1–3 mm wide; pedicels purple, 2–4 mm long; buds light purple, 2–3 mm. Flowers upturned, purple, 3–6 per fascicle; perianth 4–5 mm, perigone lacking to 0.5 mm; stamens zygomorphic, stalked. Fruit infrequent, green to black, 4–5 mm diameter, aborting. (*L. muscari*).

Phenology: June–July. *Origin*: Named by Clarence Landis. *Source*: JC Raulston Arboretum (from Alex Summers). *Accession*: 87–038. *Observations*: Possibly should be combined with 'Gold Banded', but lacking any fasciation in rachis or lateral basal branching, and bands more yellowish with age.

'Blue Giant'. Clumping groundcover 30–47 cm tall, 15–20 cm wide. Leaves erect, outer arching outward, green to dark green, 24–39 cm long, 5–15 mm wide, veins 13–35. Scapes 21–40.5 cm; peduncle green, (9–) 20–26 cm; rachis (6–) 10–15 cm, fascicles 33–50, semicrowded, internodes 2–7 mm; bracts 2–4 mm, foliar bracts not observed; pedicels 2–4 mm; buds 2–3 mm, lilac-purple. Flowers upturned, light purple; perianth 3 mm, perigone to 0.5 mm; stamens zygomorphic, stalked. Fruit subglobose, green becoming black, 3–4 mm diameter. (*L. muscari*).

Phenology: July–August; late August–September. *Origin*: Unknown. *Source*: JC Raulston Arboretum 02–0548, Mountain Crop Improvement Laboratory 2005–48. *Accession*: 12–357, Lattier 201.

'Blue Spire'. Dwarf clumper to weakly creeping with age, 13–18 cm tall, 46 cm spread. Leaves erect, green, 18–42 cm long, 6–11 mm wide, veins 13–21, weakly ribbed above. Scapes near top of foliage or to sides of bibs, 25–36 cm; peduncle compressed-terete, green becoming purplish, 16–26 cm; rachis green becoming lavender to whitish; 5–16 cm long, occasionally forming a cockscomb 8–12 mm wide at apex, fasciated with 2 terminal branches (V-shaped) 2.7–3 cm long, fascicles 20–50, open to semicrowded, internodes between clusters 7–17 mm, within clusters 2–9 mm; bracts 2–3 mm, foliar bracts 6–12 mm, rarely 135 mm; pedicels 2–4 mm, buds lavender to light purple, 4–5 mm. Flowers light purple, often 5–7 per fascicle; perianth 4–5 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit green becoming black, 6–7 mm diameter. (*L. exiliflora*).

Phenology: July–August; September–October, persisting to May–June. *Origin*: Thomasville Nursery (Hume, 1961). *Source*: as *L. muscari*, JC Raulston Arboretum (from Alex Summers). *Accession*: 87–033. *Observation*: Dwarf height over 10 years distinguishes this selection in the big blue group of cultivars.

'Border Gem'. Groundcover forming clumps 25–32 cm tall. Leaves light green, weakly glaucous below, 30–39 cm long, 7–14 mm wide, veins 7–21, ribbed above. Scapes numerous among foliage, 22–26.5 cm; peduncle compressed-terete, green to purplish, 12–16.5 cm; rachis green becoming purplish-lavender; 7–11 cm, fascicles 20–25, crowded, lowermost internodes 7–10 mm; bracts 2–4 mm, foliar bracts 6–7 mm; pedicels 2 mm, buds lavender to purple, 3 mm, frequently aborting. Flowers upturned, bluish-purple; perianth 3–4 mm, perigone lacking, stamens zygomorphic, stalked. Fruit green becoming black, to 4–6 mm diameter. (*L. muscari*).

Phenology: July–August, late August–September. *Origin*: Alex Summers. *Source*: As *L. muscari*, JC Raulston Arboretum (from Alex Summers). *Accession*: 87–026. *Observations*: Similar to *L. muscari* 'Majestic'.

'C.T. Tanner'. Weakly creeping groundcover forming clumps 10–15 cm tall, spreading weakly to 27 cm by 4–5 years. Leaves erect to falcate, arching third to half length to ground, green variegated, 22–48 cm long, 6–13 (–17) mm wide, green variegated, veins 15–27, weakly ribbed above; variegation with yellow marginal bands 1–3 mm wide fading to creamy white, becoming greenish with age. Scapes 20–36 cm: peduncle

compressed-terete, green to pale green, (12–) 17–22 cm; rachis greenish-white to whitish, 9–15 cm, fascicles 24–38, open, in groups, internodes 4–15 mm; bracts green with white marginally, 2–3 mm, foliar bracts whitish, 5–10 mm; pedicels whitish, 2–4 mm; buds white, 2–3 mm. Flowers upturned, white, 6–9 per fascicle; perianth 3–4 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit few, black, many aborting. (*L. exiliflora*).

Phenology: late June–August; September–October. *Origin*: Louisiana Nursery Catalog 1990–1992, p. 69 (Hatch, 2011a). *Sources*: JCRA Arboretum (from Louisiana Nursery), Louisiana Nursery. *Accessions*: 86–101, 89–115, non 115D = weedy sedge *Kyllinga* Rottb. *Observations*: Many leaves were non-variegated by late November and fruits often aborted by October. Leaves had been eaten by rabbits.

'California Hybrid'. Leaves mostly white. Flowers lavender. *L. muscari*. (Hatch 2011a). *Observations*: Project was unable to locate and obtain any plants. Invalid name may have been more descriptive rather than a cultivar name.

'Caeruleus'. Leaves dark green. Flowers violet-blue. *Notes*: As *O japonicus*, darker than species that is often mauve to white-tinged blue (Hatch 2011a). As mondo grass, 'Caeruleus' has dark green leaves like the parent species and violet blue flower (Clemson Cooperative Extension, 2012). As *O. jaburan*, GardenWeb (2013). *Observations*: Treated as an invalid name, a confused clone based on the descriptive name. Purplish flowers more typical of *Liriope*, not *Ophiopogon*. Project unable to locate and obtain any plants with this name.

CASSIDY. Broad spreading groundcover, plants in loose clumps to 20–40 cm tall × 30–60 cm wide. Leaves smooth, glossy, strongly incurved apically, average 38 cm long × 7 mm wide, dark green, basal sheath 4.5 cm long, 4 mm wide. Flowers purple. (*L. exiliflora*?).

Phenology: Summer. *Origin*: Discovered in 1996 by Magaly Zaias Fast (Florida) in a cultivated area of Puerto Rico. *Notes*: US PP no. 16215 P2, 5 May 2006, as *Liriope* 'Cassidy'. Asexual reproduction first performed in Puerto Rico in 1998. Plants were grown in glass greenhouse. Data on 2-year-old plants were collected in Evergem, Belgium. Riverbend Nursery (2013) cited dark green thin leaves that curl like ribbon, more pronounced when grown in the shade; blooms white reminisent of mondo grass. Grows to heights ranging from 12 to 16 inches, with a spread of 18 to 24 inches; *Liriope* plants bloom with purple, spikey flowers in clustered plumes during the middle and end of summer (Home Guides, 2013). A common plant in South Florida, the new 'Cassidy' liriope is such a unique plant because of its frizzy, curled leaves; the novel plant was introduced this year. Deroose, a wholesale grower from the Netherlands, has grown the 'Cassidy' as an indoor plant, but could also be used as an outdoor plant in South Florida (The Sun Sentinel, 2005). Pinterest (2013) and River Bend Nursery (2013) provided excellent photos. *Observations*: Unable to obtain plants for examination. A cultivar 'Curly Top' was observed in 2001, also with incurved apices.

'Cheju'. Clumping groundcover to 15–20 cm tall in winter. Leaves erect, arching outward apically, green, 39–55 cm long, 9–16 mm wide, veins 11–17. Inflorescence overtopping leaves, 43–52 cm; peduncles green, 30–37 cm; rachis 13–15 cm, loose, fascicles 11–16, internodes 5–10 (-20) cm; bracts 2 mm; pedicels 2–3 mm. Flowers dried; perianth 3–4 mm, perigone to 0.5 mm. Fruits aborting (one observed), black, 9 mm. (*L. muscari*).

Phenology: Summer; Autumn. *Origin*: Korea, wild collected on Cheju (Jeju) Island, Jeju Province, by Tony Avent, Plant Delights Nursery. *Source*: Plant Delights Nursery. *Accession*: 15–374. *Observations*: Data incomplete, based upon viewing plant in early January, leaves laxed, height probably taller.

'Chinese Whisper'. Hatch (2011b) cited *O.chingii* 'Chinese Whisper' as a listed name with Monksilver Nursery, Cottenham, Cambridge, U.K. Evidence as a valid cultivar and any description are lacking.

'Christmas Tree'. ('Monroe no. 2', 'Xmas ', 'Xmas Tree') Subclumping groundcover 17–22 cm tall × 40 cm spread, daughter plantlets to 4 cm away from parent. Leaves erect, arching slightly apically, arching near middle with age, green, 26–53 cm long, 6–18 mm wide, veins 9–13 (25–29). Scapes conspicuous among foliage, 15–30 cm long; peduncle green becoming purplish-lavender, 11–22 cm; rachis lavender, 6–11 cm, fascicles congested with buds; multilateral branched from base to apex forming a narrow pyramidal to inverted conical shape, base broad tapering and narrowing upward, lateral branches 1–22 (–30) mm long; bracts 1–3 mm, foliar bracts 5–60 mm; pedicels hidden, 2–3 mm; buds pink to pinkish-purple, 3–4 mm, often drying and persisting. Flowers upturned, pinkish-lavender, rarely opening, then only very slightly. Fruit lacking. (*L. muscari*).

Phenology: June–August. *Origin*: Raised from seed by W.L. Monroe, Monroe's Nursery (Hume, 1961); Monroe Landscape Co., Atlanta, GA, in 1930s (Adams, 1980). *Sources*: Evergreen Nursery, LA Nursery, JC Raulston Arboretum (from Riegel Nursery via Clarence Landis), Powell Gardens. *Accessions*: 85–001, 87–037, 87–058, 89–119. *Observations*: Distinctive with its consistently lateral-branched rachis, narrow pyramidal/conical in outline resembling a Christmas tree, showy buds, and lack of opened flowers. Similar to 'Samona', which is showier.

'Chumley Variegated'. A temporary working name for a variegated clone under evaluation, received from Robert Chumley. Treated herein below under unnamed clones no. 2.

CLEOPATRA ('Bigun'). Clumping groundcover. Leaves dark green, slightly twisted, 28–46 cm long, 7–14 mm wide, veins 17–21. Scapes 24–34 (–45) cm, peduncle compressed-terete, 17–25 cm, rachis 8.5–13 cm, fascicles 40–50, crowded, semiopen, internodes 5–12; bracts green, 3–4 mm, foliar bracts 6–8 mm; pedicels 2–3 mm, buds purplish, 2–3 mm. Flowers upturned, dark purple/violet, fragrant; perianth 3–4 mm, perigone lacking to 0.5 mm; stamens zygomorphic, stalked. Fruit 3–6 mm diameter, green turning black. (*L. muscari*).

Phenology: Summer. *Origin*: James Bryan Berry, June 1996, Loxley AL (Plant Genius, 2011). *Observations*: Description limited by patent data.

'Cockscomb'. Reported by Frederick E. Lee as forming a mound about 10″ tall with dull leaves 15″ long and less than 1/2″ wide (Hume and Morrison, 1967). Unable to obtain plants with this name for study and data collection. Treated as an invalid name, appearing to be a descriptive name for the cockscomb rachis found in several clones.

'Comet'. Spreading groundcover 13–16 cm tall, daughter plants 4–13 cm away from parent plant. Leaves erect, gradually arching to arching outward with age, green, variegated, 7–16 cm long, 1–2 mm wide, veins 3–7; variegation with whitish marginal band and vertical stripes. Scapes hidden among the leaves, 4–8.5 cm; peduncle flat, 3–6.5 cm; rachis arching outward, 1–3 cm; fascicles open, 4–7 m; internodes 4–6 mm; bracts green medial, white phanges outside, 2–4 mm, foliar bracts 5–7 mm; pedicels 1–2 mm; buds whitish, 3 mm. Flowers nodding; perianth 3–5 mm, perigone 1 mm; stamens actinomorphic, subsessile. Fruit not observed. (*O. japonicus*).

Phenology: June–July. *Origin*: Unknown, Darrell Probst? *Source*: Plant Delights Nursery (from Probst), Mountain Crop Improvement Laboratory. *Accessions*: 02–277, 12–366. *Notes*: A little known selection with narrow, vertical, white banding similar to other variegated cultivars, but the overall effect is a much darker plant when used in mass. Whether there are fewer stripes, or the green is darker, we do not know, but it is definitely different! 'Comet' is not extraordinarily vigorous (Plant Delights Nursery, 2010b). *Observations*: Scarcely indistinguishable from 'Kigimafukiduma', which has slightly darker pigmented flowers.

'Compact Blue' *Source*: Isaacson (1989, nos. 58, p. 40 and 182, p. 60). Invalid name lacking data.

'Compactus'. Dwarf creeping groundcover forming mounds 7–10 cm tall, spreading to 20 cm. Leaves erect, arching, narrow, green, to 5 cm long. Scapes among foliage. Flowers white-tinged lilac. Fruit glossy, dark blue.

Phenology: Summer. *Sources*: As *O. japonicus*, Backyard Gardner (2013), Deeproot Plant Base (2013), As *O. intermedius*, Hatch (2011b), Zipcode Zoo (2013) with nomenclatural hierarchy only. *Notes*: Very compact, slow growing, evergreen perennial, forming grass-like, dense tufted mounds, fairly insignificant white flowers (Deeproot

Plant Base, 2013). *Observations*: Unable to obtain plants with this name for study and data collection.

'Crested White'. Clumper, 9–12 cm tall. Leaves green, arching outward 4–7 cm aboveground, 9–18 cm long, 3–7 mm wide, veins 7–9. Scapes 10–11 cm, peduncle 9.5–10 cm; rachis 1–1.5 cm, lower internodes 4 mm, fascicles 5; rarely with basal lateral branch to 2 cm long, 11–12 fascicles; bracts 2 mm, foliar bracts not observed; pedicels 3 mm, buds white, 2 mm. Flowers nodding, white; perianth 5 mm, perigone to 0.5 mm, Stamens actinomorphic, subsessile. Fruit aborted, not observed. (*O. intermedius*).

Phenology: June. *Origin*: Clarence Landis. *Source*: As *Liriope* 'Crested White', Clarence Landis. *Accession*: 93–190. *Observations*: Leaves were eaten by rabbits. Weak plant growth for 2 years in plots before dying, scapes rare.

'Crow's White'. Leaves green, variegated, 40–50 cm long, 10–15 mm wide, veins 9–13; variegation with yellowish marginal bands and few stripes. Flowers not observed. (*O. jaburan*).

Origin: Isaacson (1989), No. 182, p. 60; 1990–1992 Louisiana Nursery Catalog, p. 70. (Hatch 2011b). *Source*: As *O. jaburan*, Louisiana Nursery. *Accessions*: 90–149, 93–190. *Notes*: Flowers white (Hatch, 2011b). *Observations*: Plants exhibited poor growth, remained vegetative, and were dead by the end of the second year.

CRYSTAL FALLS ('HOCF'). Clumper forming a mound 40–90 cm tall. Leaves dark green, slightly stiff, 21–45 (–79) cm long, 7–11 (–18) mm wide, veins 17–21. Scapes 22–28 (55–65) cm; peduncle 15–21 cm; rachis arching outward, 6–15 cm; bracts 3–7 mm, foliar bracts 9–25 mm; pedicels 3 mm; buds white, 4–5 mm. Flowers white, nodding; perianth 6–7 mm, perigone 3 mm, stamens actinomorphic, subsessile. Fruit bright blue, 9–14 mm × 8–11 mm. (*O. jaburan*).

Phenology: July–August; September–October. *Origin*: Head-Lee Nursery, Seneca SC, self-pollinated plant selected in 1990 by Robert Harold Head, grown and propagated in controlled environment in 1993 and released in 2010 as a part of the Garden Debut plant collection, US PP no. 17430 issued in 2007. *Source*s: PP 17430 (Justia Patents, 2013a), Mountain Crop Improvement Laboratory 2007–146. *Accessions*: Lattier 212. *Notes*: Resistant to Anthracnose, heat tolerant, producing more flowers and fruits than 'Vittatus' (Justia Patents, 2013a). An improved cold-hardy, disease resistant selection, makes a superior groundcover, edging or border and stands alone beautifully as a specimen (Monrovia, 2013). *Observations*: Younger plants observed, higher measurements obtained from PP description. Similar to 'Ursula Blue Fruit', a small plant with shorter leaves and a shorter perianth.

'Curly Lady'. Dwarf groundcover to 12–14 cm tall. Leaves long and narrow, dark green, apices curling inward. Scapes among foliage; peduncle green; rachis becoming light green upward, fascicles 9–12; bracts 1–2 mm; pedicels 2 mm. Flowers nodding, white, 1–3 per fascicle; perianth 3 mm, perigone 1 mm. (*O. japonicus*).

Origin: Unknown. *Sources:* As *O. japonicus*, a miniature grass with curly dark green leaves; photo (Gardino Nursery Corp., 2014); photo of leaves and flowers (Aquiya, 2014). *Observations*: Photo of flowers indicates definitely *Ophiopogon*, whereas other selections with coiled leaves (CASSIDY, 'Curly Tips') are *Liriope* with upturned flowers.

'Curly Tops'. Groundcover to 10–16 cm tall. Leaves erect, arching slightly apically, incurved, green, 22–29 cm long, 4–7 mm wide, veins. Scapes hidden among foliage, 18.5 cm; peduncle dark green, 9 cm; rachis dark green, 9.5 cm, fascicles 27; bracts 3–4 mm, foliar bracts 6–27 mm; pedicels 3; buds 2 mm. Flowers upturned; perianth 3 mm, perigone lacking; stamens zygomorphic, stalked. Fruit not observed.

Phenology: Unknown. *Origin*: Asia. *Source*: Plant Delights Nursery (from Thailand market). *Accession*: 01–258. *Observations*: Observed once, 9 Nov. 2001, with one scape postflowered, scarce persisting, dried perianth. Unable to locate in 2002 and 2012.

'Curly Twist'. Caespitose groundcover forming a small mound, 10–16 cm tall, 12–14 cm diameter spread. Leaves light medium-green to green, few twisting half to a full turn, 19–29 (–41) cm long, 7–19 mm wide, veins 13–21. Scapes hidden among foliage, 19–28 cm: peduncle green becoming purplish, 7–18 (–27) cm; rachis purplish becoming lavender, 4–6.5 cm; fascicles crowded, 25–30; bracts 2–4 mm, foliar bracts not observed; pedicels 2 mm, buds purple, 2–3 mm. Flowers upturned, purple; perianth 4 mm, perigone lacking, stamens zygomorphic, stalked. Fruit abort, not observed. (*L. muscari*).

Phenology: July–August. *Origin*: Riegel Plant Company (Hume, 1961). *Source*: Clarence Landis (from Riegel Nursery). *Accession*: 86–027. *Observations*: A dwarf selection forming small mounds and unique with some leaf blades, nonvariegated, twisting 180–360°.

'Densiflora'. Semicaespitose forming high mound, 30–40 cm tall, 30–38 cm wide, with daughter plants 1–3 cm from parent. Leaves erect, green, weakly ribbed above, weakly glaucous below, 28–46 cm long, 7–12 mm wide, veins 15–19. Scapes among leaves, 24–45 cm: peduncle green becoming purple, (7–) 18–31 cm; rachis light green to lavender, 7–23.5 cm, fascicles 15–20, open; rarely 1) with 2–3 rachises 1–3 cm long, or 2) with a cockscomb 5–8 mm wide apically, or 3) fasciated with 2–3 terminal branches 1–3.5 cm long, or 4) bearing a basal lateral branch 1.5–2.5 cm; bracts 2–5 cm, foliar bracts ascending, (8–) 15–60 (130–210) cm long, 1 mm wide; pedicels lavender 2–3 mm, buds dark purple, 2–3 mm. Flowers upturned, purple to dark purple; perianth 3–4 mm, perigone 0.7–1.3 mm; stamens zygomorphic, stalked. Fruit sparse, green becoming black, 6–7 mm diameter. (*L. platyphylla*).

Phenology: June–August; September–October. *Origin*: Possibly *L. graminifolia* var. *densiflora* Miller. *Source*s: as *L. muscari*, Carroll Nursery, Evergreen Nursery. *Accessions*: 87–059, 90–139. *Observations*: Distinctive with its gigantic, narrow, ascending foliar bracts early in blooming season and dark purplish buds and flowers.

Dwarf. Creeping groundcover forming dwarf mounded cluster, 12–15 cm tall × 160–180 cm diameter, daughter plants 0.5–5 cm from parent. Leaves erect with outer foliage arching near base outward, green variegated, 4.5–8 cm long, 1–2 mm wide, veins 5–7; variegation with creme-whitish margins and longitudinal stripes. Scapes hidden among foliage, 3–4.5 cm; peduncle flat, green, 2–3 cm; rachis arching outward, 0.5–1.5 cm; bracts 2 mm, foliar bracts 6–10 mm; pedicels 2 mm. Flowers nodding, not observed. Fruit not observed. (*O. japonicus*).

Phenology: July. *Origin*: Japan, imported by Darrell Probst. *Source*: As *O. japonicus* dwarf form, Plant Delights Nursery (from Probst, 7 Dec. 1998). *Accession*: 02–274. *Observation*: Invalid name for an unnamed clone, "dwarf" intended as descriptive term, not a cultivar name. Morphologically similar to **'Kigimafukiduma**'.

Dwarf. Creeping groundcover forming clusters of tufted mounds 3–4 cm tall, 5–7 mm diameter. Leaves erect-arching outward from near base to middle, dark green, 3–4.5 cm long, 1–2 mm wide, veins 3–5. (*O. japonicus*).

Origin: Japan, imported by Darrell Probst in 2001. *Source*: As *O. japonicus* dwarf, Plants Delight Nursery (from Probst, Nov. 2011). *Accession*: 12–337. *Observations*: Invalid name, a descriptive term, morphologically similar to **'Bluebird'**.

'Dwarf Lilyturf'. A temporary working name used as a descriptive term by the National Arboretum for a distinct unnamed clone. Treated herein below under unnamed clone no. 3.

'Early Bloomer'. A temporary working name assigned by Jason Lattier for a distinct unnamed clone under evaluation. Treated herein below under unnamed clone no. 4.

'Ebknizam' ('Ebznizan'). Leaves erect, purplish-black, 14–18 cm long, 2–3 mm wide. Scapes 9–10 cm; peduncles flat, purplish-black, 6–7 cm; rachis arching-ascending 30°, 3 cm, fascicles few, loose; bracts 2–3 mm, foliar bracts 6–10 mm; pedicels 2 mm; buds 2–3 mm. Flowers nodding, whitish; perianth 5–6 mm, perigone 2 mm; stamens actinomorphic, subsessile. Fruits not observed. (*O. planiscapus*).

Phenology: June. *Origin*: Japan. *Source*: Plant Delights Nursery (from Mountain Crop Improvement Laboratory no. 2010–031. *Accession*: 13–371. *Observations*: Leaf sizes and scape and peduncle length measurements were shorter than its trademark name EBONY KNIGHT. Only young plants were examined, and measurements of these characters will increase with older plants in liriopogons. More conservative traits such as rachis, perianth, and perigone lengths are in agreement with the trademark name.

EBONY KNIGHT ('Ebknizam', 'Ebznizan'). Slow spreading creeping groundcover 8–13 (-22) cm tall, daughter plants 5–11 cm away from parent plant. Leaves erect, arching near apex, green becoming purplish-black above, green below, (13–) 17–27.5 cm long, 5–8 mm wide, veins 9–11. Scapes (14–) 18–20 cm long; peduncle flat, purplish-black, 12.5–15 cm long; rachis arching-ascending 30° from vertical, bearing thin translucent wings, 1.5–4.5 cm, fascicles 5–9, loose, internodes 3–7 mm; bracts 3–5 mm, foliar bracts black medially, 6–12 mm; pedicels black, 1.5–3 mm; buds 2–3 mm. Flowers nodding, whitish with pale lilaceous hue; perianth 5–5.5 mm long, perigone 2 mm; stamens actinomorphic, subsessile. Fruit purplish-black. (*O. planiscapus*).

Phenology: June–August; August–September. *Origin*: Japan, trademarked by Monrovia. *Source*: Carroll Gardens. *Accessions*: 86–018. *Notes*: Purple-black evergreen leaves, delicate lavender flowers in late summer, and is a slow but excellent dry site groundcover (PRN, 2013). Treats 'Ebknizam' as the cultivar for the trademark name (Monrovia, 2013; PRN, 2013). *Observations*: Trademark variation reported to be more superior and more "blackish" than 'Nigrescens'. However, the degree of green vs. black hues in leaves very seasonally and with age. Some daughter plants remained green, not becoming purplish-black.

'Ebzninan'. Invalid orthographic name = **'Ebknizam'**.

'Edge of Knight' ('Edge of Night'). Small creeping groundcover. Leaves erect, slightly arching apically, green to purplish-black, variegated (15–) 26–33 cm long, 2–6 mm wide, veins 7–11; variegation with narrow white medial longitudinal stripe and occasional white marginal band. Scapes 9–17 cm; peduncle flattened, black, 7–18 cm, rachis black, 3–7 cm, fascicles 7–15, internodes 3–8 mm; bracts 2–4 mm, foliar bracts 6–15 mm; pedicels 1–2 mm. Flowers nodding, pale pink-lavender; perianth 4–5.5 mm, perigone 1–2 mm; stamens actinomorphic, subsessile. Fruit small, black. (*O. planiscapus*).

Phenology: July; August. *Origin*: Japan, imported by Barry Yinger. *Source*: Plants Delight Nursery (from Barry Yinger, May 2002). *Accessions*: 02–273, 12–336. *Notes*: White-edged black mondo grass is a rare form, a collector's item with a thin white edge on each black leaf and short stems of blue flowers in summer, producing tight clusters of shiny black pea-sized berries that hang on all winter (Collector's Nursery, 2013). *Observations*: A selection similar to EBONY KNIGHT, but variegated. Daughter plants lose white markings with age, and produced green leaves.

'Edge of Night'. Invalid orthographic name = **'Edge of Knight'**.

'Eleven-O-Three' ('1103'). Groundcover forming broad clumps 25–30 cm tall. Leaves green, 21–37.5 cm long, 4–12 mm wide, veins 13–21. Scapes well above foliage, 26–52.5 cm; peduncles green, 26–38 cm; rachis light green, 10–19.5 cm, fascicles 35–45, internodes 3–7 mm; bracts 2–4 mm, foliar bracts lacking; pedicels 3–4 mm; buds 2–3 mm. Flowers upturned, light violet, drying dark, (3) 5–7 per fascicle; perianth 3–4 mm, perigone lacking; stamens zygomorphic, stalked. Fruit black, 10 mm diameter. *(L. muscari*).

Phenology: Summer. *Origin*: Chance seedling in Harold Hume's garden, 1103 S.W. Second Avenue, Gainesville, FL (Hume, 1961). *Sources*: Clarence Landis, collected from Hume's garden; Hume and Ward s.n. voucher (21 July 1962). *Accession*: 87–084, FLAS 14156. *Notes*: Noteworthy for its very long racemes of flowers well over the foliage mass (Hume, 1961). *Observations*: Unable to locate this clone being marketed. Limited material examined from the original source, Hume's garden. Landis' collection exhibited poor growth and died within 2 years.

'Emerald Cascade' ('YAM001'). Groundcover forming dense, weeping clumps, 30–40 cm tall × 90 cm wide. Leaves glossy emerald-green, very narrow, strong arching downward apically. Fruit blue. (*L. graminifolia*?).

Origin: Imported from China in 1980s, one seedling selected and bred by Arnold Teese, Monbulk, Victoria, Australia. *Notes*: 'YAM001' was compared with 'Evergreen Giant' and 'LIRJ', distinguished by dense habit, very narrow leaf width, and peduncle with weak anthocyanin coloration (Plant Varieties Journal, 2014). As *L. muscari*, a dramatic arching form of glossy emerald foliage with a spectacular mop top effect, thrives in shade and difficult areas; use for dense garden borders, narrow pathways, and fence lines, or as a patio container plant, indoor house plant; photo (Plants Management Australia. 2014). As *Liriope*, features include a dramatic arching emerald foliage, spectacular mop top effect (Prestige Plants, 2014). *Observations*: 'YAM001' was compared with two unrelated selections of *L. gigantea*. 'Emerald Cascade' is not known to be in the United States. The mop top effect suggest that this may be similar to 'Mop Top' collected from China by Darrell Probst in 2002.

EMERALD GODDESS ('Love Potion No. 13'). Large caespitose clumper 45–60 cm tall, 60–75 cm wide. Leaves dark green, smooth, glossy and leathery, arching-pendulous, 45–53 cm long, 13 mm wide. Scapes conspicuous above pendulous leaves, 42–63 cm: peduncle 15–25 cm; rachis 27–38 cm; fascicles 60–80; pedicels violet, 4–7 mm; buds ovoid, violet, 3 mm. Flowers upturned, purplish-violet, 10 mm diameter, 2–6 flowers per fascicle. Fruits rare, globose, green, 4–5 mm diameter. (*L. gigantea*).

Phenology: June–September (FL). *Origin*: Discovered in 1997 of unknown parentage growing in a bed of 'Evergreen Giant', Rode Groundcovers, Williston, FL. U.S. Patent applied in 2004 as *L. muscari*, PP no. 15471 issued 11 Jan. 2005. *Source*: Rode Groundcovers (2013). *Notes*: Rode Groundcovers (2013): 'Emerald Goddess' (PP no. 15,471) is a robust sport of *L. muscari* 'Evergreen Giant' isolated from commercial production at our Florida nursery. Blooms are stable for an 8–12-week blooming period (mid-June through early September), much more prolifically than other *L. muscari*. Has a multiplication rate of ≈2.5 times faster than 'Evergreen Giant' from a single division. Appears to be much more resistant to "crown rot." *Observation*: Patent misidentified to species.

'Evergreen Giant'. Weak creeper forming a broad caespitose clump 45–76 cm tall, 80–100 cm diameter with age. Leaves erect, arching only near apex, thick, stiff, smooth above, dark green with lower part purple-speckled, glaucous below, 40–80 cm long, 8–16 mm wide, veins 7–13. Scapes hidden among leaves, borne toward outer part of clump, 23–30 cm long; peduncle green becoming purple, (12–) 20–40 cm; rachis green to whitish with lavender to purple above, 8–16 cm, fascicles 25–45, open, internodes 4–15 mm; bracts green 3–5 mm, foliar bracts 6–8 mm; pedicels tinged purple, 3–6 mm, buds lavender to light purple, 4–5 mm. Flowers lavender to light purple outside, becoming dark purple (inner surface) when flower opens; perianth 4.5–5 mm, perigone 0.7–1 mm; stamens zygomorphic, stalked. Fruits subglobose, black, 9–11 mm diameter, most aborting. (*L. gigantea*).

Phenology: late July–October; October. *Origin*: Evergreen Nursery. *Source*s: As *L. muscari*, Clarence Landis (from Malloy Gardens), Evergreen Nursery, JC Raulston Arboretum (from Windmill Farms), K-Mart. *Accessions*: 87–060, 87–090, 88–105, 90–137, 96–248, 99–253. *Observations*: Earliest named clone of the giant liriopes, distinctive for its large, clumping, dark green, leathery grass-like foliage with spikes of purplish-lilac flowers in late summer and early fall.

'EXC 052'. Clumping groundcover 40–50 cm tall, 40–50 cm wide. Leaves erect, arching outward, green, 20–40 cm long, 5–15 mm wide. Scapes strong and long, 15–20 cm; rachis with 150–200 flowers; pedicels 4–6 mm; buds 4–6 mm. Flowers upturned, violet; perianth 5 mm.

Phenology: Summer–autumn in the Netherlands. *Origin*: A mutation of 'Moneymaker' discovered in June 2005 by External Plant Boijl B.V., The Netherlands. US PP 21352 issued 28 Sep. 2010. *Source: L. muscari* 'EXC 052', IFI Claim Patent Services (2012a). *Notes*: Differs from 'Moneymaker' by: larger plants, longer scapes, more and darker flowers, and tolerant to lower temperatures (IFI Claim Patent Services, 2012a). *Observations*: U.S. patented name is **PURPLE EXPLOSION.**

'Exiliflora' (*L. muscari* var. *exiliflora* (Bailey) H. Hara). Invalid name, used to reduce a varietal name to the rank of cultivar. A distinct species = *L. exiliflora*.

'Franklin Mint'. Robust spreading groundcover to 25–30 cm tall, daughter plants (4–) 12–28 cm from parent plant. Leaves erect to arching outward, green, lightly glaucous below, 14.5–31 cm long, 2–8 mm wide, veins 9–13. Scapes erect,

somewhat conspicuous among leaves, 18.5–24 cm; peduncle compressed-terete, lightly green, minutely-winged, 12.5–17 cm; rachis green tinged lavender, 4–7.5 cm, fascicles 20–40, loose, internodes 5–10 mm; bracts green tinged purplish, 2–4 mm, foliar bracts green, 6–14 cm; pedicels tingled purple, 2–3 mm; buds lavender, 2–4 mm. Flowers upturned, lavender with some darker purple markings medially on perianth lobes; perianth 3–4.5 mm, becoming reflexed apically with age, perigone 0.6–1 mm; stamens zygomorphic, stalked. Fruits abundant, green becoming black, 5–6 mm diameter. (*L. spicata*).

Phenology: July–August; mid-August–September, persisting to June. *Origin*: Carroll Gardens. *Source*: As *L. spicata*, Carroll Gardens. *Accession*: 90–147. *Observations*: Infrequently offered in the market, described as a robust spreader. This clone became very invasive after 4 years in the liriopogon plots, required termination in 1998.

'Fuiri Gyoku Ryu'. Creeping dwarf groundcover forming tufted mounds 5–9.5 cm tall, 6–13 cm spread, daughter plants 0.5–6.5 cm away from parent plant. Leaves erect-arching outward from below middle, green variegated, 6–13 cm long, 1–2 mm wide, veins 3–7; variegation with creme to white vertical stripes and margin. Scapes hidden among foliage, 3–5 cm; peduncle flat, green, 2–3.5 cm; rachis green, arching outward, 1–1.5 cm, fascicles 3–4, loose; bracts 2–3 mm, foliar bracts not observed; pedicels white, 2 mm; buds 3 mm. Flowers nodding, pale lavender; perianth 3 mm, perigone 1 mm; stamens actinomorphic, subsessile. Fruits not observed. (*O. japonicus*).

Phenology: June–July. *Origin*: Japan, imported by Ozzie Johnson in 2003. *Sources*: Mountain Crop Improvement Laboratory 2010–058 (from Plant Delights Nursery); Plant Delights Nursery (from Ozzie Johnson, Apr. 2003 and Sep. 2005). *Accessions*: 01–264, 12–339. *Notes*: Plant Delights Nursery's database noted: ''Barry Yinger reported that the correct name should be 'Shima Ryu', but he does not want to make a change for the time being. *Observations*: Shima Ryu (1823–1900) was a Japanese artist and pioneering photographer. Unable to locate a liriopogon cultivar with the artist's name. Marketed under the name used herein. Similar to 'Nana', and smaller than similar 'Tama Ryu' and 'Variegatus' (*O. japonicus*).

'Fuku-ho-ryu'. Hatch (2011b) cited the plant as a listed cultivar name of *Ophiopogon*, but lacked a source. *Observation*s: Treated as an invalid name herein as no other source of this name was located.

'Garden Delights'. A temporary working name assigned by Paul Fantz for a distinct unnamed clone under evaluation. Treated herein under Unnamed clone no. 3.

'Giant' ('Gigantea'). Invalid descriptive names used with *L. muscari*, indicating a larger plant = *L. gigantea*.

'Gilner White'. Invalid name, used by J. C. Raulston in 1980 for evaluation, but quickly changed to 'Traebert White' and released under that name in 1983. Some bibs were obtained by others (e.g., Clarence Landis) under 'Gilner White' before its official release from the JC Raulston Arboretum = **'Traebert White'**.

'Gin Ryu'. Japanese cultivar name, marketed in the United States under its English translation = **'Silver Dragon'**.

'Gold Banded'. Clumping groundcover 13–23 cm tall, 33 cm diameter spread. Leaves erect, arching near base outward, reflexing to ground, slightly ribbed above, green to light green, variegated, 16.5–38 cm long, 6–16 mm wide, veins 13–23; variegation with yellow marginal band 1–2 mm wide, becoming creme-white with age, rarely with narrow stripe(s), Scapes among leaves, 16.5–25 cm; peduncle purple, 10–16 cm; rachis lavender-purplish, (6–) 9–15 cm, fascicles 20–35, semicrowded, internodes 2–6 mm, rarely (1) with a basal lateral branch to 4.5 cm long, or (2) fasciated with 2–3 branches 0.5–0.7 cm long, cockscomb lacking; bracts 2–4 mm, foliar bracts 6–9 mm; pedicels 2–3 mm; buds purplish, 2–3 mm. Flowers upturned, purple to dark purple, often 3–7 per fascicle; perianth 3–4 mm, perigone lacking; stamens zygomorphic, stalked. Fruits rare, commonly aborting, green becoming black, 5 mm diameter. (*L. muscari*).

Phenology: July–September; September. *Origin*: Riegel Nursery (Adams, 1980; Hume, 1961). *Sources*: Clarence Landis (from Riegel Nursery), Carroll Nursery, LA Nursery. *Accessions*: 87–043, 89–118, 90–140. *Observations*: Golden margin on leaves not kept during the season.

'Gold Edge'. Isaacson (1989), No. 50465, p. 18. Invalid name lacking descriptive data.

'Gold Leaf'. A temporary descriptive name used by Plant Delights Nursery for a distinct unnamed clone. Treated herein under Unnamed clone no. 5.

'Gracilis'. Groundcover forming tight clumps 30–45 cm tall. Leaves dark green, ribbed above, (23–) 35–50 cm long, 1–2 mm wide, veins 3–7, midrib raised midrib below. Scapes hidden among leaves, 6–10 cm, peduncle flat, green, 5–6 cm, rachis erect to weak arching apically, green, 3–4 cm, fascicles 9–11, loose; bracts 2–3 mm, foliar bracts not observed; pedicels 1–2 mm, buds 2 mm. Flowers not observed. Fruits not observed. (*O. japonicus* var. *caespitosus*).

Phenology: July. *Origin*: *O. gracilis* Kunth? A synonym of *O. japonicus*. *Source*: As *O. japonicus* 'Gracilis', Plant Delights Nursery (from Nature's Curiosity). *Accession*: 02–272. *Observations*: Similar to 'Aritaki' and 'Seoulitary Man'.

'Grandiflora'. Caespitose groundcover to 17–42 cm tall, 15–45 cm diameter spread. Leaves erect, arching outward, green, ribbed above, weakly glaucous below, 19–51 cm long, 4–15 mm wide, veins 9–19. Scapes well below foliage, 15–28 (–39) cm long; peduncle compressed-terete, green with bluish hue apically, (11–) 16–29 cm long; rachis light lavender, 7–13 cm long, fascicles 29–51, crowded, internodes 5–7 mm long, lowermost 10–15 mm long, occasionally 1) forming a cockscomb 6–12 mm wide apically, or 2) fasciated, 2–4 vertical branches 1–5 cm long, or 3) bearing an ascending lateral branch above the middle to 2.5 cm; bracts 3–5 mm, foliar bracts 7–50 mm; pedicels lilac, 2–4 mm long; buds whitish to lilac-lavender to purple, 2–3 mm, most drying out and persisting. Flowers upturned, lavender to bluish-purple to purple; perianth 3–4.5 mm long, perigone 0.2–0.5 mm; stamens zygomorphic, stalked. Fruit globular, green to black, 6–8 mm diameter. (*L. muscari*).

Phenology: July–September; September, few persisting to June. *Origin*: Riegel Nursery. *Source*: Clarence Landis (from Riegel Nursery, Bentlay Nursery). *Accessions*: 87–045, 87–089. *Observations*: Not a particularly striking flowering clone. Similar to 'Big Blue'.

'Grandiflora White'. ('Grandiflora Variegata', some 'Aztec'). Spreading groundcover 20–30 cm tall. Leaves spreading-arching from near base, green, variegated, 19–33 cm long, 4–11 mm wide, veins 11–15; variegation with golden to creme to whitish margins 0.5–1 mm wide and occasional stripes. Scapes conspicuous, overtopping arching leaves, 13–18 cm; peduncle compressed-terete, dark green, 4–14 cm, rachis green to white apically, 5–11 cm with white phlanges, fascicles 23–32, open, internodes 9–17 mm; bracts pale green, whitish-hyaline margins, 3–7 mm, foliar bracts not observed; pedicels white, 3–6 mm, buds pale white. Flowers nodding, white; perianth 4 mm, perigone 2–3 mm; stamens actinomorphic, subsessile. Fruit abort. (*O. intermedius*).

Phenology: July–August. *Origin*: As *Liriope* 'Grandiflora'Variegata' from Bentlay Nursery in 1987, then name changed to 'Grandiflora White'. *Source*: Bentlay Nursery, Clarence Landis (from Bentlay Nursery), K-Mart, NCSU Horticultural Science Greenhouse Conservatory 2011–098. *Accession*: 87–086, 93–234, 97–252, *Observations*: Not cold hardy in Raleigh area. Used in lower south for distinctive variegated foliage and conspicuous, nodding white flowers. Commonly known as Aztec grass or border grass, sometimes marketed as 'Aztec'.

'Grandiflora Variegata'. An invalid Latinize name (post 1959, must be a fancy name) derived from marketing distribution in 1987 by Bentlay Nursery as *Liriope* 'Grandiflora'Variegata' (white flowered), then market under fancy name 'Grandiflora White', and in mid-1990s changed back to 'Grandiflora Variegata' = **'Grandiflora White'**.

'Grape Fizz'. Weakly creeping groundcover forming clumps 30–40 cm tall, 45–50 cm diameter. Leaves erect, arching outward from middle to below middle, green, 37–43 cm long, 1–4 mm wide, veins 5–7. Scapes well-overtopping foliage, 60–72 cm; peduncles green, 49–57.5 cm; rachis green, 13–15 cm, fascicles 35–40, loose; bracts 3 mm; pedicels 5–8 mm; buds 2 mm. Flowers upturned, lavender, 8 mm diameter, 3–7 per fascicle; perianth 4 mm, perigone 2–3 mm. Fruits not observed. (*L. longipedicellata*).

Phenology: August. *Origin*: China, collected by Darrell Probst as CPC 26.11.01.1B. *Source*: As *O. intermedius*, Plant Delights Nursery (from Darrell Probst, Apr. 2005). *Accession*: 12–332. *Observations*: Unique selection distinctive with long, narrow green leaves and giant inflorescences with lavender flowers on elongated pedicels.

'Green Giant'. Groundcover producing clumps. Leaves dark green, erect, then recurving toward ground, 25–46 cm long, Scapes in center of clumps; flowers small, purple; fruit black, autumn; *L. muscari*, common name: Green Giant *Liriope*. (New Visions Nursery, 2013). Invalid name, appears to be marketing vernacular term, not a cultivar name.

'Green Midget'. Weakly creeping clone forming a small, tightly compact mound 17–26 cm tall × 12–16 cm diameter, daughter plants near parent plant, roots intertwined. Leaves erect, green, 21–30.5 cm long, 3–6 (–10) mm wide, veins 9–11. Scapes hidden among leaves, 21–30 cm; peduncle green, 10–19 cm; rachis purplish, 8.5–13 cm, fascicles 20–26, open, rarely with a basal lateral branch to 2 cm long; bracts 3–4 mm, foliar bracts 5–8 mm; pedicels 2–2.5 mm, buds purple, 2 mm. Flowers upturned, purple; perianth 2.5–4 mm, perigone 0.5–1 mm, stamens zygomorphic, stalked. Fruit black, to 6 mm diameter. (*L. exiliflora*).

Phenology: (June) July–August; September. *Origin*: Riegel Plant Company (Adams, 1980). *Source*: Clarence Landis (from Riegel Plant Company), Evergreen Nursery. *Accessions*: 87–036, 87–062. *Observations*: Not prolific, weak growth. Scapes produced were few, not produced in every year for accession 87–062. Vegetative growth only for accession 87–036 in research plots from 1987–1998.

'Gyoku Ryu'. Dwarf creeping groundcover forming dense mounds 7–10 cm tall, spreading with age to 60–90 cm wide, daughter plants 0.5–7 cm away from parent plant. Leaves erect to arching outward, dark green, green below, 5–15 cm long, 1–3 mm wide, veins 3–7. Scapes hidden among leaf bases, 3–7 cm; peduncle flat, green, 3–5.5 cm; rachis arching outward, pale lavender, 1–2.5 cm, fascicles 3–5, loose, internodes 2–7 mm; bracts 2–4 mm, foliar bracts not observed; pedicels 1–2 mm; buds pale pink, 2–3 mm. Flowers nodding, pale pink; perianth 3–4 mm, perigone 1–2 mm. Fruit green to blue. (*O. japonicus*).

Phenology: June–early July; late August–September. *Origin*: Japan. *Sources*: JC Raulston Arboretum no. 98–1407, Plant Delights Nursery (from Tidwell Nursery, Dec. 2007). *Accessions*: 01–263, 12–339. *Observations*: Desired as a miniature evergreen groundcover of rich dark green grass-like foliage for protective and small areas. 'Bluebird' is a smaller version that is more densely compact, and 'Super Dwarf' is the extreme miniature clone version.

'Gyoku Ryu Dwarf'. Dwarf tufted groundcover forming dense mounds of adjacent plants, 3–4 cm tall; rhizomes 0.5–1 mm long with daughter plants adjacent to parent plants. Leaves erect, scarcely arching apically, dark green, 4–6 mm long, 1–2 mm wide, veins 5–7. Inflorescence lacking. (*O. japonicus*).

Phenology: Unknown. *Source*: Plant Delights Nursery. *Accessions*: 12–340. *Observations*: Scarcely larger but similar to 'Super Dwarf'.

'Haku Ryu' vs. **'Haku Ryu Ko'**. A clone of an unknown species of *Ophiopogon* was imported to the United States by Barry Yinger in 1974 who named it 'Little Tabby'. He discovered in 2009 that the real name was 'Haku Ryu Ko'. Also, Kurt Blumel named it 'Pam Harper' before the Japanese name was known. Both of these names are confused in the nursery/landscape trade and on Internet sources, each associated with both Japanese names. However, association belongs correctly with 'Haku Ryu Ko'. These clones are treated as distinct in Japan, not as synonymous. The Japanese name Haku Ryu translates to ''white dragon'' and Haku Ryu Ko translates to ''white dragon light.'' The similarity in names causes the confusion. The JC Raulston Arboretum obtained both clones (as *O. japonicus*) from a Japanese nursery in 1990. Examination of the flowering characteristics indicated that one is *O. planiscapus* and the other one is *L. spicata*.

1) **'Haku Ryu'** ('Haky-ryu', 'Hakuryu', some misidentified 'Haku Ryu Ko'). Creeping groundcover forming distant clumps 20–30 cm tall. Leaves erect, green, variegated, 21–33 cm long, 2–6 mm wide, veins 5–11; variegation with white margin and vertical stripes; juvenile leaves often nearly white with thin medial green stripe. Scapes among leaves, 14.5–20 cm; peduncle green, 10–17 cm; rachis light green turning lavender, 3–7.5 cm, fascicles 18–23, loose, internodes 2–9; bracts 2–3 mm; pedicels 2 mm; buds lavender, 2–3 mm. Flowers upturned, pinkish-lavender; perianth 4 mm, perigone 1 mm; stamens zygomorphic, stalked. Fruits green becoming black, 4–5 mm diameter (*L. spicata*). *Phenology*: August–September; September–November. *Origin*: Japan. *Source*: As *O. japonicus*, JC Raulston Arboretum (from a Japanese Nursery). *Accession*: 90–131. *Notes*: 'Hakuryu' is sometimes sold under the name 'Pamela Harper', the wonderful garden writer and photographer who introduced it to the public (Joy Creek Nursery, 2013a). *Observations*: The upturned flowers and stamens denote it is a *Liriope*, misidentified to genus. It is similar to 'Quail Garden', but bearing shorter scapes and rachis.

2) **'Haku Ryu Ko'** ('Hakuryu Ko', 'Hoku Ryu Ko', 'Little Tabby', 'Pam Harper', 'Pamela Harper', some misidentified 'Hakuryu'). Spreading groundcover, 7–27 cm tall, mat forming with age to 20–30 cm wide in 5 years. Leaves arching outward in lower third, green, variegated, 13–28 cm long, 3–8 mm wide, veins 5–7 in narrower leaves to 9–13 in broader leaves; variegation with yellow to creamy-white marginal band 0.3–1.5 mm wide and whitish vertical stripes. Scapes few, overtopping arching leaves, (8.5–) 14–21.5 cm; peduncle laterally compressed, dark green tinged purple, (5–) 14–18 cm; rachis green to dark green tinged purple, falcate, arching near base, 3–4.5 cm, fascicles 6–9, open, internodes 6–12 mm; bracts 2–5 mm, foliar bracts 7–10 mm; pedicels tinged lavender, 2–4 mm. Flowers nodding, white with pale lavender marginal band on tepal; perianth 4–5 mm, perigone 1 mm, stamens actinomorpic, stalked. Fruit ellipsoidal, 6 × 4 mm, brownish. (*O. planiscapus*).

Phenology: July; late July–August. *Origin*: Japan. *Sources*: As *O. japonicus* 'Little Tabby', Mountain Crop Improvement Laboratory, as *O. planiscapus* 'Haku Ryu Ko', Plant Delights Nursery (as *O. japonicus* from Yinger, from Kurt Blumel); as *O. japonicus* 'Hakuryu Ko', JC Raulston Arboretum no. 04–1597 (from Japanese nursery). *Accessions*: 90–133, 12–341. *Observations*: Slow grower, best in shade.

'Hartledge Giant'. Weakly creeping to form a broad caespitose clump to 50–70 cm tall. Leaves erect, scarcely arching near apex, stiff, green, smooth, weakly glaucous below, 50–70.5 cm, 8–16 mm wide, veins 9–13. Scapes among foliage, 26–42 cm, peduncle green tinged purplish, 17–26 cm; rachis 9–17 cm, fascicles 35–45, open, internodes 6–14 mm; bracts 2–3 mm, foliar bracts 5–6 mm; pedicels 4–6 mm; buds 4 mm. Flowers bluish-light purple with thin white margin on perianth lobes; perianth 4–6 mm, perigone 1–1.5 mm; stamens zygomorphic, stalked. Fruits not observed, aborted. (*L. gigantea*).

Phenology: late August–October. *Origin*: Discovered 1987 as an unknown liriopogon by Richard Hartledge in Raleigh. *Source*: Richard Hartledge. *Accession*: 87–091. *Observations*: Scarcely indistinguishable from 'Evergreen Giant', flowers slightly larger.

'Hawk's Feather' ('Hawksfeather'). Groundcover forming a tight clump 20–30 cm tall. Leaves erect, green to dark green, variegated, 25–61 cm long, 4–10 mm wide, veins 13–21; variegation irregular, yellow to creme, mottled above middle with arching/oblique transverse blotches 3–27 mm deep vertically. Scapes 20–47 cm; peduncle green becoming purplish, 21–40 cm; rachis green to lavender to grayish-white, 5–13 cm, fascicles 23–35, loose, internodes 4–9 mm, rarely 1) with a basal lateral branch 1–2.5 cm long, or 2) forming a cockscomb 5–8 mm wide and fasciated with 1–4 ascending branches 2–6.5 cm, or 3) with lateral branches 1–4 cm long; bracts ovate, 2–4 mm, foliar bracts 6–7 mm; pedicels 2–3 mm; buds purple, 2–3 mm. Flowers upturned, purple; perianth 3–4 mm, perigone to 0.5 mm; stamens zygomorphic, stalked. Fruit globular, green becoming black, 5–8 mm diameter. (*L. muscari*).

Phenology: July–August; late August–November. *Origin*: Unknown. *Sources*: As J.C. Raulston Arboretum (from Paul Aden), Plant Delights Nursery. *Accessions*: 86–028,

01–255, 12–324. *Notes*: This bizarre banded monkey grass is a true collector's item; each small clump has dark green leaves, each heavily banded with bright yellow markings, most dramatic in late spring after the new growth has emerged, and fade slightly in the fall and winter months (Plant Delights Nursery, 2010a). *Observations*: Leaves frequently chewed by rabbits in research plot. One of two nonclosely related clones with transverse bands; 'Torafu' is a dwarf with narrow bands and very narrow leaves.

'HOCF' U.S. patent no. 17430, marketed under the patented name = **CRYSTAL FALLS**

'Hoku Ryu Ko' ('Hakuryu') Invalid names, orthographic variations = **'Haku Ryu Ko'**

'Hosoba Kokuryu'. Spreading groundcover forming little clumps to 10 cm tall. Leaves black, narrow, needle-like. Flowers lilac/mauve. Fruit shiny, black. (*O. planiscapus*).

Phenology: June–July. *Origin*: New Zealand? *Sources*: As *Ophiopogon* 'Hosoba Kokuryu', Southland Park Nursery (2013); Waiere Nursery (2013). *Notes*: A unique form of black mondo grass that has black, narrow, needles of grass-like foliage, clump-forming habit, 10 cm height, mauve flowers (Waiere Nursery, 2013). Ideal for the front of a sunny or partly shaded border, on a rockery or would look great in a shallow container with other plants or by itself (Srubland Park Nursery, 2013). *Observations*: Data limited for this clone. Apparently not in the United States under this name. However, 'Koku Ryu' is in the United States and searches of name associate it as a synonym of 'Hosoba Koku Ryu'. Treated herein as separate clones as 'Koku Ryu' was not a dwarf plant and leaves appear broader than ''needle-like.''

'Ingwersen'. Creeping groundcover forming loose clumps, 15–30 cm tall, daughter plants 1–3 cm away from parent plant. Leaves arching outward below middle, becoming pendulous above middle, yellowish-green to light green, 23–28 cm long, 7–10 mm wide, veins 7–9, ribbed above. Scapes near foliage apex to well above foliage, 25–30 cm; peduncle green becoming purplish, 21–24 cm; rachis green becoming lavender, 4–7.5 cm, fascicles 18–30, loose, internodes 3–9 mm; bracts 2–3 mm, foliar bracts not observed; pedicels 2–3 mm; buds lavender to light purple, 2–3 mm. Flowers upturn, purplish-lavender; perianth with marginal clear zone, 3.5–4 mm, perigone 0.5–1 mm. Fruit abundant, green becoming purplish-black, 6–7 mm diameter. (*L. spicata*).

Phenology: June–September; August–September. *Origin*: Paul Simon, Gärtnerischer Pfanzenbau, Staudenweg, Germany. *Source*: As *L. muscari*, JC Raulston Arboretum 88–0096 (from Gärtnerischer Pfanzenbau). *Accession*: 88–094. *Observations*: Slow grower. Similar to 'Franklin Mint' and 'New Orleans'.

'Intermedius'. Creeping groundcover forming dense tufts to 8–15 cm tall, daughter plants 3–5 cm away from parent plant. Leaves erect, weakly arching apically with age, green, 8–25 cm long, 1–3 mm wide, veins 3–7. Scapes hidden among foliage, 7–10 cm; peduncle flat, 3.5–6.5 cm; rachis arching outward, 1.5–3.5 mm, fascicles 5–8, loose, internodes 5–8 mm; bracts 2–3 mm, foliar bracts 5–7 mm; pedicels 1–2 mm; buds pale pink, 2–3 mm. Flowers nodding, pale pink; perianth 3–4.5 mm, perigone 1–2 mm; stamens actinomorphic, subsessile. Fruit 4 mm diameter. (*O. japonicus*).

Phenology: June; July. *Source*: As *O. japonicum* 'Intermedium', JC Raulston Arboretum 88–085 (from Dr. Hans Simon, Gärtnerischer Pfanzenbau); as *O. intermedius*, Plant Delights Nursery (from Heronswood, Apr. 2005). *Accession*: 88–098; 12–313. *Observations*: Name confusing, not an *O. Intermedius*; possibly the cultivar name was changed to a specific epithet. Largest of the dwarf clones of the species with green leaves.

ISABELLA ('LIRF'). Upright groundcover forming a clump 40–55 cm tall × 65–85 cm spread. Leaves erect, slightly arching outward, yellow-green, 24–30 cm long, 3–7 mm wide. Scapes among leaves, 20–28 cm; peduncle yellow-green, 15–22 cm; rachis 5–6 cm; bracts yellow-green; pedicel purple; buds purple. Flowers upright, pink, 8–11 mm diameter, 4–5 per fascicle; stamens zygomorphic, stalked. (*L. exiliflora*?).

Phenology: late December–February, Sydney, Australia. *Origin*: Open-pollination seedling of *L. muscari* 'Big Blue' in 2002 in a New South Wales Australian nursery, finally selected by Todd A. Layl in 2005. *Source*: U.S. Patent no. 20080235838 P1, *L. muscari* 'LIRF' (IFI Claims Patent Services, 2012b). *Notes*: published on 25 Sept. 2005, also published as PP no. 20622. A distinctive clone of *L. muscari* characterized by its narrow leaf width, dense foliage, and pink flowers; lawn alternative for sun and heavy shade, garden borders, specimen and mass planting. Ideal for use around stepping stones (Ozbreed, 2008b). *Observations*: Plants not examined, but patent data presented suggest it is *L. exiliflora*, not *L. muscari*.

'Javanensis'. Invalid name as a synonym name = **'Argenteovittatus'**

'Jeanerette'. Spreading groundcover forming loose clumps to 15–18 cm tall, daughter plants 1–4 cm away from parent plant, to 7–9 cm away from parent with age. Leaves erect, arching in upper third, dark green, variegated, 22.5–40 cm long, 4–8 mm wide, veins 9–17; variegation with dull vertical yellowish-green bands 1–2 mm wide and occasional yellowish-green stripes 1–2 mm wide along veins. Scapes numerous among foliage apex, 22–24 cm; peduncle green tinged purplish, 15–24 cm; rachis green to whitish-lavender, 6.5–11 cm, fascicles 23–34, open, internodes 3–9 mm; bracts 2–3 mm, foliar bracts not observed; pedicels 2–3 mm, buds lavender to purple, 2–3 mm. Flowers upturned, bluish-purple with narrow white margin on perianth lobes; perianth 3.5–4 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit numerous, persisting to spring, green becoming black, 6–8 mm diameter. (*L. exiliflora*).

Phenology: June–August; August–September. *Origin*: Louisiana Nursery. *Source*: As *L. muscari*, JC Raulston Arboretum (from Louisiana Nursery), Louisiana Nursery. *Accessions*: 88–100, 89–120. *Observations*: Robust grower, becoming very invasive with daughter plants and seed germination. Excellent for massing.

'John Burch'. Caespitose clumper, 34–39 cm tall × 13–17 cm diameter spread. Leaves arching 1/3 from base, green, variegated, 21–44 cm long, 6–14 mm wide, veins 13–19 (–25); variegation with golden fading to whitish-creme marginal bands 1–5 mm wide, occasionally with medial longitudinal bands 1–2 (–4) mm wide. Scapes 20–37 cm; peduncle green becoming purplish, 12–22 cm long; rachis lavender 8–18 cm long, forming a cockscomb to 10–17 mm wide apically, fascicles 45–60, crowded, internodes 2–5 mm, sometimes lowermost 15–25 mm, rarely 1) branched basally, 1–2 branches to 10 mm long, or 2) fasciated terminally with 3–11 branches 15–42 mm long; bracts green, 3–4 mm, foliar bracts 6–17 mm; pedicels 2–3 mm; buds dark purple, often dried, persistent on cockscomb. Flowers upturned, purplish to dark purple, commonly five per fascicle; perianth 3–4 mm, perigone lacking; stamens zygomorphic, stalked. Fruit rare, black, 3–4 mm diameter, mostly aborted. (*L. muscari*)

Phenology: July–August; September–October. *Origin*: Riegal Plant Company (Adams, 1980). *Sources*: Clarence Landis (from Riegel Nursery), Evergreen Nursery, LA Nursery, Powell Gardens. *Accessions*: 85–005, 87–040, 87–063, 89–111. *Observations*: Distinctive with its showy cockscombs of dark purple flowers and terminal fasciation borne just above the foliage.

'Juru'. Creeping dwarf groundcover. Leaves erect, arching around the middle, green with whitish marginal band. Scapes slightly overtopping leaves; rachis arching from vertical, fascicles 4–5. Flowers nodding, whitish. (*O. planiscapus*).

Phenology: Summer. *Origin*: Unknown. *Source*: As *O. japonicus*, Plant Delights Nursery (from Heronswood Botanical Garden and Nursery, Kingston, WA, Mar. 2003, planted out 2004). *Notes*: Qualitative description and photo (Heronswood Botanical Garden and Nursery, 2013). *Observations*: Not examined in study. Unable to locate plant at Plant Delights Nursery in 2006; not cited in their database in 2012.

JUST RIGHT ('LIRJ'). Groundcover forming a loose cluster 60–65 cm tall × 50 cm diameter. Leaves erect to semierect, arching and weeping as foliage matures, smooth, stiff, green, 40–50 cm long, 6–7 mm wide. Scapes among leaves, 20–24 cm; peduncle yellowish-green to grayish-purple, 7–13 cm; racemes 11–13 cm, bracts yellow green; pedicels whitish becoming purple-violet as flower opens; buds yellow and purple-violet. Flowers purple-violet, 4–5 mm diameter, three per fascicle. (*L. gigantea*).

Phenology: December–February, Sydney, Australia. *Origin*: Seedling selection from open-pollinated *L. muscari* in 1999 at a nursery in New South Wales, Australia; selected as 'LIRJ' in 2002 by Todd Anthony Layt and granted plant breeders' rights 27 Mar. 2006 under Application No. 2006/037. *Source*: US PP no. 20116 issued 23 June 2009 (USPP, 2009). *Notes*: Ozbreed (2008a) cited that Just Right is a much better alternative to the popular *Liriope*, 'Evergreen Giant' as it is no longer a stable variety since nurseries everywhere in Australia have been growing it from seed for years, and it now comes in all different shapes and sizes. Just Right has not produced a viable seed over 6 years. Also, Just Right is more tolerant of *Phytophthora* than 'Evergreen Giant'.

'Kigimafukiduma' ('Silver Mist', some *O. japonicus* dwarfs). Dwarf weak creeping groundcover forming open mounds 10–13 cm tall, daughter plants nearby, 1–6 cm away from parent, a few 8–14 cm away from parent, filling in to form compact tufted mounds after 5 years 15–20 cm tall, spreading to 25–30 cm diameter. Leaves erect to arching, green, 7–19 cm long, 1–3 mm wide, veins 5–7, variegation with 0.2–1 mm creme to white margins and narrow vertical striations. Scapes hidden among leaf bases, 4.5–9 cm: peduncle flat, light green, (2–) 4–6.5 cm; rachis arching outward, pale green to whitish above, hyaline winged, 2–3.5 cm, fascicles 4–7, internodes 2–8 mm; bracts 2–4 mm, foliar bracts, 6–9 mm; pedicels 1.5–3 mm; buds weakly tinged pinkish, 2–3 mm. Flowers nodding, white tinged pale pinkish-lavender, darkest at perianth margin; perianth 3–5 mm, perigone 1–3 mm, stamens actinomorphic, subsessile. Fruit green becoming dark shiny blue, 8–11 mm diameter. (*O. japonicus*).

Phenology: June–August; August–October, persisting through winter to May. *Origin*: Japan, imported by Barry Yinger. *Notes*: Tony Avent reported that Yinger proposed the name 'Kigimafukiduma' in jest, and has never been a valid cultivar name. Silver Mist mondo grass is a very slow-growing plant spreading slowly by tuberous roots and stolons (San Marcos Growers, 2013b). *Sources*: As 'Kigimafukiduma', Evergreen Nursery, LA Nursery, Horticultural Products, Inc., Plant Delights Nursery; as 'Silver Mist', Clarence Landis, Hines Nursery. *Accessions*: 87–077, 90–128, 90–150, 91–172, 96–250, 12–341. *Observations*: 'Kigimafukiduma' is the oldest known name for this clone and the common one used in the market, thus a valid name. Similar to 'Shiroshima Ryu' and differentiated by slightly larger flowers.

'Kigimafurkidoma', 'Kigimagurkidoma', 'Kigimasfukiduma', 'Kigimatfuduma', 'Kijimafukiduma'. Invalid names, orthographic variations in spelling of a difficult name. = **'Kigimafukiduma'**

'Kioto'. Invalid name, an orthographic spelling error = **'Kyoto'**

'Koku Ryu' ('Kokuryu', 'Koma Ryii'). Creeping groundcover forming small mound 15–20 cm tall. Leaves erect, weakly arching above middle, green to purplish-black, pale below, 15–23 cm long, 3–7 mm wide, veins 9–13. Scapes 15–21 cm; peduncles flat, green to purplish-black apically, 10–18.5 cm, rachis purplish-black, 4–6.5 cm, fascicles 5–12, loose; bracts 4–6 mm, foliar bracts 8–13 mm; pedicels 2–3 mm. Flowers nodding, fragrant, pale pinkish with medial purplish stripe on sepal lobes; perianth 4–5 mm, perigone 1–2 mm; stamens actinomorphic, subsessile. Fruit not observed. (*O. planiscapus*).

Phenology: June. *Origin*: Japan. *Notes*: Kokuryu is a form of martial arts. A Japanese paramilitary society, the Black Dragon Society, is ''Kokuryu-kai'' (Wikipedia, 2013a). *Source*: As 'Koku Ryu', JC Raulston Arboretum (labeled as 'Koma Ryii'). *Accession*: 87–092. *Observations*: This black dragon mondo grass selection was named possibly after the Japanese paramilitary society. Name confused and sometimes synonymized with 'Hosoba Kokuryu', a different clone. Planted in Arboretum's Lath house in fall 1986, vouchered postbloom and in June 1987, but gone by August.

'Koma Ryii'. Invalid name, an orthographic variation = **'Koku Ryu'**

'Korean Giant'. Invalid name, descriptive for the larger Korean *Ophiopogon* = **'Aureovariegatus'**

'Korean Giant'. *Source*: As *O. planiscapus*, Mountain Crop Improvement Laboratory no. 2011–127 (Lattier et al., 2014). *Observations*: Plant not examined in study. Species is endemic to Japan, not native to Korea. Treated as an invalid name.

'Korean Variegata'. Invalid name, a descriptive term for *O. jaburan* 'Variegata' = **'Aureovariegatus'**

'Kyoto' ('Kioto', 'Kyoto Dwarf'). Creeping groundcover forming a tufted mound 5–10 cm tall × 36–60 cm wide, daughter plants 1–2 cm away from parent, 3–10 cm away with age. Leaves erect, arching outward from middle to near apex, green, slightly glaucous below, 4–12 cm long, 1–3 mm wide, veins 5–9. Scapes hidden among leaves, 4–6 cm; peduncle flat, dull whitish tinged green, 3–5 cm; rachis arching, 1.5–2.5 cm, fascicles 4–6, loose, internodes 1–6 mm; bracts pale green, 2–3 mm, foliar bracts 5–11 mm; pedicels 1–2 mm; buds pinkish, 3 mm. Flowers nodding, pale pink with lavender midstripe on sepal lobes; perianth 3–4 mm, perigone 1 mm. Fruit green to dark green, becoming blue to purplish-blue, 5–6 mm diameter. (*O. japonicus*).

Phenology: June–early August; August–October. *Origin*: Japan, named for the Imperial Palace in Kyoto, where clone dated from 780 A.D. (Graf, 1985). *Sources*: As 'Kioto', Kurt Bluemel, Inc, Plant Delights Nursery (from Kurt Bluemel, from Ozzie Johnston); as 'Kyoto Dwarf, LA Nursery. *Accessions*: 89–109, 91–153, 12–342. *Observations*: Fruit persist through winter.

'Kyoto Dwarf'. *Source*: Louisiana Nursery. *Accession*: 89–109. *Notes*: tufted, underground stolons, leaves 4 cm, recurved, dark green, small pale lilac flowered, Imperial Palace in Kyoto from 780 A.D. (Graf, 1985). Data on plants identical to = **'Kyoto'**.

'Kyoto Super Dwarf'. Groundcover 2–3 cm tall. Leaves dark jade green, narrow. Fruit in the size of large peas and bright peacock blue. *Notes*: It is beautiful in walkways and pathways, also used for bonsai, and if you are lucky enough to get it to bloom, you may see the fruit (Armitage, 2013). *Observations*: Not observed in this study. Description weak, could fit with 'Kyoto' or 'Super Dwarf'.

'Leucanthus' (*O. planiscapus* var. *leucantheus* (Makino) Nakai; f. *leucanttheus* (Makino) Okuyama, 'Albus'). Creeping groundcover 15–25 cm tall. Leaves erect, arching above middle, medium dark green, 15–22 cm long, 3–7 mm wide, veins 7–13. Scapes conspicuous at top of foliage, 18–22 cm; peduncles dark green, 13–16.5 cm; rachis suberect, slightly off vertical at 10–30°, dark green, 4.5–5.5 cm, fascicles 8–11, internodes 2–6 mm, lowermost to 16 mm; bracts 2–4 mm, foliar bracts 8–16 mm; pedicels 2 mm. Flowers nodding, whitish, 6 mm diameter; perianth 4–5 mm, perigone 2 mm. Fruit not observed. (*O. planiscapus*).

Phenology: June. *Origin*: Japan. *Source*: As var. *leucantheus*, Plant Delights Nursery (from Cotsworld Gardens, Evesham, Worcestershire, U.K., Mar. 1996). *Accession*: 13–367. *Observations*: Originally described as a botanical variety in 1919, reduced in 1955 to a form based on a single trait, a variation in flower color. Modern international rules treat these as a cultivar, as correctly cited by Hatch (2011b).

'Lilac Beauty'. Caespitose groundcover forming small clumps to (15–) 20–32 cm tall, spreading 20 to 45 cm apically. Leaves erect to arching outward below the middle, green, ribbed above, 20–51 cm long, 5–17 mm wide, veins 13–23. Scapes numerous, conspicuous among often just above foliage, 18–34 (–42) cm; peduncles compressed-terete, green becoming purplish, 12–29 cm; rachis purplish, 6–14 cm, fascicles densely crowded, 30–50, internodes 1–5 mm long, lowermost occasionally 10–17 mm, occasionally 1) forming a cockscomb 3–13 mm wide, and/or 2) fasciated, 3–5, rarely 7–11 terminal branches 0.5–4 cm long, or 3) rarely with 1–2 ascending lateral branches 2–4.5 cm, borne above the middle of the rachis; bracts green, 2–4 mm, foliar bracts 6–11 mm; pedicels 2–3 mm; buds lavender, 3 mm. Flowers upturned, lilac with darker lilaceous-purple inner surface, often 6–9 per fascicle; perianth 3–4 mm long, perigone lacking to 0.5 mm; stamens zygomorphic, stalked. Fruit sparse, green to dark green, 5–6 mm diameter, aborting. (*L. muscari*).

Phenology: July–early September; September. *Origin*: Riegel Plant Company (Adams, 1980; Hume, 1961). *Source*: Andre Viette Perennials, Carroll Gardens, Clarence Landis (from Riegel Nursery), Evergreen Nursery, LA Nursery. *Accessions*: 86–022A, 87–050, 87–064, 89–113, 90–141. *Notes*: A prolific flowering cultivar displayed well above the foliage, one of the showiest of all *Liriope* selections in flower (Midcap and Clay, 2009). *Observations*: 86–022B-C were nonlabeled, mail-ordered substitutes,

identified later in study as 'Christmas Tree'. Clumper with summer flowers later than many liriopogon selections and bearing increased visual effect with some cockscombs and branching. Some misidentified selections marketed under this name leading to "weak stoloniferous" in descriptions.

'Lilac Wonder'. Spreading groundcover forming a mass to 18–30 cm tall × 20 cm spread. Leaves arching below to near middle outward, green, to 20 cm long. Scapes numerous, overtopping leaves, to 15 cm; rachis above leaves, semicrowded, fascicles appear to be 30–45. Flowers lilac-purple. (*L. exiliflora*).

Phenology: Summer–autumn. *Origin*: Exceptio? *Sources*: Australia and England. *Notes*: Data from description and photo; profusely flowering, use in edging, underplanting and borders (Handleskwekerij Exceptio BV, 2013a). Forms a dense groundcover that can be used under shallow-rooted trees and along streams or ponds and help stabilize soil on banks or slopes (Darwin Perennials, 2013). *Observations*: New selection assigned to *L. muscari*, but photo and data suggest that it is a *L. exiliflora*. Presently not known to be in cultivation in the United States. However, included as a result of an inquiry in 2011 from a Floridian nurseryman interested in 'Lilac Wonder' and 'Purple Passion', and how they compared with 'Lilac Beauty'.

'LIRF'. U.S. patent no. 20080235838 P1, marketed under trademarked name = ISABELLA

'LIRJ'. U.S. patent no. 20116, marketed under trademarked name = **JUST RIGHT**

'LIRTP'. U.S. plant patent no. 20623, marketed under trademarked name = **AMETHYST**

'Little Tabby'. A synonym of an older cultivar. *Origin*: Japan, imported to the United States and named by Barry Yinger in 1974. *Sources*: As '*O. japonicus,* Plant Delights Nursery (from Barry Yinger). *Accession*: 02–266. *Observation*: Barry Yinger discovered in 2009 the real name =**'Haku Ryu Ko'**.

'Love Portion No. 13'. U.S. patent no. 15471, marketed under trademarked name = **EMERALD GODDESS**

'Lynn Lowery'. Groundcover forming a clump to 36–100 cm tall × 40–100 cm diameter, daughter plants 3–6 cm from parent bib. Leaves erect, slightly arching above, stiffly pliable, medium dark green, green below, 47–77 cm long, 7–10 mm wide, veins 7–13, smooth to minutely ribbed above. Scapes (20–) 35–46 cm; peduncle dark green (13–) 20–32 cm; rachis 8–17.5 cm, fascicles 25–32, loose, internodes 3–7 mm, rarely with lateral branch to 17 mm long; bracts 3–5 mm, foliar bracts not observed; pedicels 3–4 mm; buds lavender, 2–3 mm. Flowers upturned, purple, 3–5/fascicle; perianth 3–4 mm, perigone 0.5–2 mm; stamens zygomorphic, stalked. Fruits not observed. (*L. gigantea*).

Phenology: August. *Origin*: Lynn Lowery Nursery, Luflin, Texas. *Sources*: J.C. Raulston Arboretum no. 04–2084, Mountain Crop Improvement Laboratory 2010–062. *Accession*: 15–377, Lattier 117. *Observations*: Flowers a darker hue and leaves narrower than other selections similar to 'Evergreen Giant'.

'Maireri' (*L. maireri*). Tall groundcover forming clumps 35–40 cm tall. Leaves erect, scarcely arching, dark-green, 24–42 cm long, 1–2 mm wide, veins 5–7. Scapes among foliage to above foliage, (25–) 50–57 cm; peduncle light green, (20–) 36–40 cm; rachis 9–15.5 cm, fascicles 25–40, open; bracts 2 mm, foliar bracts not observed; pedicels 2–3 mm; buds 2 mm. Flowers upturned, light purple; perianth 4 mm, perigone 1 mm; stamens zygomorphic, stalked. Fruit not observed. (*L. graminifolia*).

Phenology: July. *Origin*: China. *Source*: Plants Delights Nursery (from China, 8 Jan. 2008). *Accession*: 02–296. *Observations*: *Liriope maireri* is a species name not recognized by international rules (Fantz, 2008b). Clone data are in agreement with **'Porcupine'**.

'Majestic' (*L. exiliflora*). Creeping groundcover forming loose clumps to 25–32 cm tall × 22 cm spread. Leaves erect, arching near apex, green, 25–41 cm long, 5–12 mm wide, veins 9–13. Scapes numerous in tops of leaves, 24–36 cm; peduncle compressed laterally, green tinged slightly purplish, 16.5–26 cm long; rachis green to pale lavender-whitish, 7–14 cm long, fascicles 30–40, loose, internodes 4–13 mm, rarely forming a cockscomb 6–11 mm wide and fasciated with 3–9 terminal branches 1.5–3.5 cm; bracts green, 2–4 mm, foliar bracts 6–10 mm; pedicels 2–4 mm; buds lavender, 2–3 mm. Flowers upturned, lavender to bluish-purple; perianth 3–4 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit abundant, green to dark green, becoming black, 6–8 mm diameter, persisting to June. (*L. exiliflora*).

Phenology: July–August; September–October. *Origin*: Misidentified *L. muscari* 'Majestic'. *Sources*: As *L muscari* 'Majestic', Carroll Gardens, Garden Place, LA Nursery. *Accessions*: 86–006, 86–010B, 89–116E. *Observations*: Growth form of a loose clumper for several years probably led to its misidentification as *L. muscari*. Two different clones spotted near the edge of the 'Big Blue' bed at Evergreen Nursery were vouchered (Fantz 4365 and 4366) in 1987. They apparently came from the adjacent 'Majestic' bed as daughter plants via underground rhizomes. Similar to 'New Wonder', but segregratable. Different species can have the same cultivar name. Therefore, we presently are using the marketed name, but adding the species after it to distinguish it from two other species with 'Majestic'.

'Majestic' (*L. muscari*). Clumping groundcover 25–32 cm tall. Leaves erect, arching outward at or above middle, green, weakly glaucous below, 26–40 cm long, 6–17 mm wide, veins 9–21. Scapes conspicuous, near top to above leaves, 23–36 cm; peduncle green to dark green tinged purplish, 12–28 cm; rachis lavender, 6–15 (–19.5) cm, fascicles 25–40, crowded, rarely 1) with 1–2 basal branches, 3.5–17 mm, or occasionally 2) forming a cockscomb 4–15 mm wide, and/or 3) fasciated with 2–5 terminal branches 0.5–5.5 cm long, or (4) with 1–3 ascending lateral branches near the apex, 4–11 mm long; bracts 2–4 mm, foliar bracts 6–18 mm; pedicels 2–4 mm; buds lavender to purple, 2 mm. Flowers upturned, lavender-purple; perianth 3–4 mm, perigone lacking to 0.5 mm; stamens zygomorphic, stalked. Fruit rare, mostly aborted, green becoming black, 6–7 mm diameter. (*L. muscari*).

Phenology: July–September; October. *Origin*: Russell Gardens (Adams, 1980; Hume, 1961). *Sources*: As *L. muscari*, Evergreen Nursery, Clarence Landis (from Riegel Nursery). *Accessions*: 87–041, 87–065, 89–116A-D non E. *Observations*: Scapes up to 10%–20% fasciated, fewer with cockscombs. Riegel Nursery was the oldest known nursery with 'Majestic' stock. Two other clones marketed as 'Majestic' belong to different species, but the original 'Majestic' was assigned to *L. muscari*.

'Majestic' (*L. spicata*). Robust creeping groundcover forming a dense mass 18–25 cm tall, daughter plants numerous, away from parent 4–23 cm by second year, then invasive, 17–44 cm from parent by fourth year, forming 120–150 cm diameter spread. Leaves erect-arching, green to yellowish-green, 16–36 cm long, 3–9 mm wide, veins 5–11. Scapes among leaves, 6–22 cm; peduncles green to dark green slightly tinged purplish, 6–18 cm; rachis pale green tinged pinkish to lavender, 2.5–5 cm, fascicles 9–15; bracts green, 2–4 mm, foliar bracts green, 8–80 mm; pedicels 2–3 mm; buds pinkish to tinged lavender, 2–3 mm. Flowers upturned, pinkish to pale lavender; perianth 2.5–3 mm, perigone 1 mm; stamens zygomorphic, stalked. Fruit green becoming black, 5–6 mm diameter. (*L. spicata*).

Phenology: June–early September; late July–October. *Origin*: Unknown. *Sources*: As *L. muscari* 'Majestic', Carroll Gardens; as *L spicata* 'Majestic': Busse Gardens, Shady Oaks Nursery. *Accessions*: 86–010ACDE, non B, 87–049, 87–055. *Observations*: Invasive, weedy clone with non-showy flowers and fruit. Useful only as a groundcover with bare soil for erosion control. One of three clones marketed as 'Majestic', the other two belonging to different species.

'Majestic Variegated'. Weakly spreading groundcover forming clumps 20–35 cm tall, daughter plants 2–13 cm away from parent plant. Leaves erect and arching, green variegated, 22–40 cm long, 4–8 mm wide, veins 11–21; variegation with yellow marginal band 1–3 mm wide, fading to creme to whitish, occasionally with vertical stripes. Scapes overtopping leaves, 24–37 cm: peduncle light green to yellowish-green, becoming purplish, 14–26 cm; rachis tinged lavender, 9–17 cm, fascicles 32–49, loose; bracts 2–5 mm, foliar bracts not observed; pedicels lavender, 2–4 mm; buds purple, 3 mm. Flowers upturned, purplish; perianth

3–4 mm, perigone to 0.5–1 mm; stamens zygomorphic, stalked. Fruit lacking. (*L. exiliflora*).

Phenology: July–September. *Origin*: Classic Groundcovers. *Source*: As *L. muscari*, JC Raulston Arboretum (from Classic Groundcovers). *Accession*: 87–051. *Observations*: Difficult to find in the market place.

MARC ANTHONY ('Marant'). Groundcover forming a clump 18–24 cm tall × 20–60 cm diameter. Leaves slightly semiglossy, glaucous below, dark green variegated, 34–48 cm long, 7–14 mm wide, veins 13–17; variegation with yellow marginal band fading to creamy-white. Scapes 31–44 cm; peduncles yellowish-green becoming purple, 25–35 cm; rachis (6–) 10–17 cm, fascicles 37–50, internodes 3–11 mm; bracts 2–4 mm; pedicels 2–3 mm; buds bluish-purple, 2–3 mm. Flowers upturned, slightly fragrant, bluish-purple; perianth 3–4 mm, perigone 0.5–1 mm. Fruit not observed. (*L. muscari*).

Phenology: summer. *Origin*: a unique variegated seedling of unknown parentage identified by James Bryan Berry in Mar. 1993 among 100,000 plants purchased from a North Carolina nursery and grown in a commercial nursery in Loxley, AL. Patent filed 8 Dec. 2005, issued 4 Aug. 2009 as 'Marant' (Justia Patents, 2009). *Source*: Hatch (2011a), Justia Patents (2009), Mountain Crop Improvement Laboratory. *Accession*: Lattier 218. *Notes*: useful in planters and borders, effective in mass, heat and drought tolerant, full sun to shade, withstands wind and salt spray (Justia Patents, 2009). Marc Anthony will become the landscape designer's choice in ornamental groundcovers as the only one of its kind to have three foliage color hues (Southern Living, 2013). *Observations*: Several clones have three foliage color hues during the season. Similar in appearance with *L. muscari* 'Variegata'.

'Marant'. U.S. plant patent no. 20207, marketed under the trademarked name = **MARC ANTHONY**.

'Merton Jacobs'. Open pollinated seedling of *L. gigantea* selected by Randall Merton Jacobs in 1994, Flowerwood Nursery. U.S. plant patent no. 12068, marketed under the trademark name = **SUPER GREEN GIANT**.

'Mexican Giant' (sometime labeled as 'Aztec'). Groundcover forming a clump 45–60 cm tall × 40–60 cm diameter. Leaves erect, light green variegated, 17–29 (50–60) cm long, 4–6 mm wide, veins 11–13; variegation with thin white marginal band and thin longitudinal white stripes. Scapes among leaves, 10–13 cm, peduncle dark green, 4–6 cm; rachis white, fascicles 40–55, open, 6–7 cm; bracts 2–3 mm, foliar bracts not observed; pedicels 3 mm. Flowers white, nodding; perianth 4 mm, perigone 2 mm. Fruit not observed. (*O. intermedius*).

Phenology and *Origin*: Unknown. *Source*: As *L. muscari* 'Aztec', Flowers Nursery, as *Liriope* Aztec Mexican Giant grass, Miero Macro International, Windernew FL. *Accession*: 92–178, 96–244. *Observations*: Plants not cold hardy in Raleigh, NC area. Similar to 'Variegated Evergreen Giant'.

'Miniature'. Weak creeping groundcover, daughter plants close to parent, forming a loose clump to 25–40 cm tall, to 45 cm wide, vigorous with age. Leaves erect, arching slightly above the middle, green, glaucous below, 21–42 cm long, 4–8 mm wide, veins 11–17. Scapes among the foliage, hidden to slightly conspicuous, 21–30 cm; peduncle green, (8–) 13–20 cm; rachis lavender, 2–6 cm, fascicles 8–15, open; bracts 3–4 mm, foliar bracts 8–10 mm; pedicels 3–4 mm; buds pinkish-lavender, 2–3 mm. Flowers upturned, light lavender; perianth 3 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit green becoming black, 4–6 mm diameter, aborting, only few persisting. (*L. spicata*).

Phenology: June–September; September–February. *Origin*: Louisiana Nursery. *Source*: as *L. muscari*, Louisiana Nursery. *Accession*: 89–114. *Observations*: Distinctive *Liriope* with its miniature rachis, a weak creeper with shorter rachis of fewer flowers than other *Liriope* cultivars, thus nonfloriferous. Long phenology with flowers collected in each month, however, flowers were absent in each of these months in some years.

'Minimus'. *Origin*: Unknown. *Source*: As *O. planiscapus*, Hatch (2011b). *Notes*: Unable to locate data on Internet except for "more compact," limited data cited by Hatch (2011b). Treated herein presently as an invalid name, possibility a descriptive term.

'Minor'. Dwarf creeping groundcover forming mounds 5–10 cm tall, to 30–90 cm diameter spread. Leaves erect, arching outward above middle, dark green, 4–17 cm long, 1–2 mm wide, veins 3–7. Scapes hidden among foliage, 2–7 cm: peduncle flat, 2–4.5 cm; rachis 1–2 cm; fascicles 5–7, loose, internodes 4–6 mm; bracts 2–3 mm, foliar bracts 5–9 mm; pedicels 2 mm, buds 3 mm. Flowers nodding, creme-white tinged pink; perianth 3–4 mm, perigone 1–2 mm; stamens actinomorphic, subsessile. Fruit hidden, ellipsoidal, blue, 9 × 7 mm. *(O. japonicus*).

Phenology: June; autumn, persisting through winter. *Origin*: Japan. *Sources*: Clarence Landis, Graf (1985), JC Raulston Arboretum no. 88–093 (from Gärtnerischer Pfanzenbau), Plantify (2013b), The Palm Center (2013). *Accessions*: 88–099, 93–189. *Notes*: *O. japonicus* 'Minor' is a diminutive but tough evergreen perennial forming a dense clump of dark green arching leaves that make excellent groundcover; sprays of small white flowers in late summer are followed by striking steel-blue berries in autumn; good for shady situations (Plantify, 2013b). *Observations*: Similar to 'Gyoko Ryu', but with more fascicles of paler flowers.

'Minor'. *Sources*: As *L. minor*, K-Mart in Raleigh, NC; as *Liriope* 'Minor', Louisiana Nursery. *Accessions*: 89–103, 90–246. *Notes*: advertised as "New selection. Reduced size and miniature fruits. Colonizes over area rapidly of fine textured plants." *Observations*: This is an obnoxious, invasive weed, not a liriopogon! An invalid name, a sedge misidentified as a liriopogon. A key segregating sedges from liriopogons was provided by Fantz (2008a). = *Kyllinga* Rottb. sp. (Cyperaceae Juss.).

'Moneymaker'. Groundcover forming clumps to 25–30 cm tall, 30–40 cm wide. Leaves erect-arching from below middle, medium green with lighter apices, 15–28 cm long, 5–9 mm wide. Scapes above foliage, showy; peduncle purple, rachis purplish to lavender above, fascicles numerous, crowded, occasionally 1) fasciated with 2–3 terminal branches 1–2 cm long, or 2) sometimes forming a cockscomb. Flowers bluish-purple, upturned; stamens zygomorphic, stalked. Fruit not observed.

Phenology: August–October. *Origin*: Unknown. *Sources*: As *L. muscari*, Handelskwekerij Exceptio (2013b), Hatch (2011a), Plantify (2013a). *Notes*: 'Moneymaker' is an exceptionally free flowering form producing masses of flower spikes in late summer and early autumn; grows optimally under shade or partial shade; reaches maturity in 2–5 years (Plantify, 2013a). Superior clumper to 'Big Blue', less dense and shorter scape than 'Summer Beauty' (Hatch, 2011a).

'Monroe No. 1' ('Monroe no. 1', 'Monroe's no. 1'). Invalid evaluation name and orthographic variations used before official release = **'Monroe's White'**.

'Monroe No. 2' ('Monroe no. 2', 'Monroe's no. 2'). Invalid evaluation name and orthographic variations used before official release = **'Christmas Tree'**.

'Monroei'. Invalid Latinized orthographic variation of Monroe's white flowered selection. = **'Monroe's White'**.

'Monroe's White' ('Monroe no. 1', 'Monroei', 'Monroe's no. 1'). Groundcover forming a clump 15–24 cm tall × 40–45 cm diameter. Leaves green to dark green, 22–38 (–45) cm long, 5–17 mm wide, veins 13–19 to 23 raised with age. Scapes among leaf apices to slightly overtopping leaves, 24–38 cm long; peduncles green to white apically, 15–26 cm; rachis white, 8–13.5 cm, fascicles congested 35–40, lower internodes 1–5 mm; bracts 3–5 mm, foliar bracts not observed; pedicels 2–4 mm; buds white, 1.5–2 mm. Flowers upturned, white; perianth 3 mm, perigone lacking; stamens zygomorphic, stalked. Fruit not observed. (*L. muscari*).

Phenology: June–August, flowers aborted by September. *Origin*: Raised from seed by W.L. Monroe, Monroe's Nursery (Hume, 1961); Monroe Landscaping Co., Atlanta, GA, in 1930s (Adams, 1980). *Sources*: Carroll Gardens, Evergreen Nursery, J.C. Raulston Nursery (from Riegel Nursery), Louisiana Nursery, Powell Gardens. *Accessions*: 85–002, 86–011, 87–042, 89–117, 90–142. *Observations*: Older clumping selection with broad green leaves and white-flowered scapes above the leaves. Similar to 'Alba' and 'Traebert White'.

'Moore's White'. Caespitose groundcover to 25–35 cm tall. Leaves erect, arching apically, green to dark green, 25–43 cm long, 7–12 mm wide, veins 13–27, ribbed above.

Scapes among the foliage, 22–28 cm; peduncles light green to greenish-white apically, 17–22 cm; rachis white, 5–7.5 cm, fascicles 30–45, crowded; bracts 2–3 mm; pedicels 2 mm; buds white, 3 mm. Flowers upturned, white; perianth 3 mm; perigone to 0.5 mm; stamens zygomorphic, stalked. Fruit few, green becoming black, mostly aborted. (*L. muscari*).

Phenology: July–August; September–October. *Origin*: Unknown. *Source*: McDonald Garden Center. *Accession*: 89–125.

Observation: Similar to Monroe's White, but taller habit with a shorter rachis. Could cultivar name be an orthographic error, Moore for Monroe?

'Mop Top'. Dense groundcover forming a clump to 22–25 cm tall × 50–60 cm wide. Leaves erect, arching near middle outward and bending downward toward ground forming a canopy around base, dark green, 45–56 cm long, 1–3 mm wide, veins 5–7. Scapes among leaves, 24–30 cm; peduncles green, 16–21 cm; rachis 9–13 cm, fascicles loose, 19–28; bracts 2 mm; pedicels 2–3 mm. Flowers died below fruit; perianth 3 mm; perigone 1 mm. Fruit bluish-black, 9–11 mm. (*L. graminifolia*).

Phenology: summer; fall–winter. *Origin*: China, collected by Darrell Probst as CPC 26.2.02.1B, clone B. *Notes*: named in 2013 by Avent, Plant Delights Nursery, for the narrow clumped leaves resembling the strands in a mop.

Source: Plant Delights Nursery. *Accession*: 15–373. *Observations*: Similar to EMERALD CASCADE in Australia?

'Nana' ('Nanus'). Creeping groundcover forming a dense mound, 5–13 cm tall × 27–45 cm diameter, daughter plants 0.5–2 mm from parents. Leaves arching outward above middle, green to dark green variegated, 6–12 cm long, 1–3 mm wide, veins 5–7; variegation with 1–2 mm silvery marginal bands, occasionally with 1–2 mm vertical stripes. Scapes hidden among leaves, 3–5.5 cm; peduncle pale green, 3–4 cm; rachis pale green, 1.5–2 cm, fascicles 4–6, loose; bracts 2–3 mm, foliar bracts 5–10 mm; pedicels tinged pale lavender, 1–2 mm, buds pinkish, 3 mm. Flowers nodding, pale pink; perianth 3–4 mm, spreading to reflexed with age, drying brownish, and persisting, perigone 1 mm, stamens actinomorphic, subsessile. Fruit green, 6–7 mm diameter. (*O. japonicus*).

Phenology: June–July; September–October. *Origin*: Japan. *Source*: As '*Nana*', Evergreen Nursery, Mountain Crop Improvement Laboratory 2010–052, Plant Delights Nursery (from Kurt Bluemel, Sept. 1997). *Notes*: very ornate dwarf grass that has short, deep green blades that fold over and resemble a head of hair; use instead of turf as a lawn substitute, around a pond, between pavers and along stairs, and makes a unique standalone container as well (Stepables, 2013). A dependable performer if given the shady moisture-retentive soil it likes; 'Nana' will serves as a low maintenance lawn substitute (Treadwell Nurseries, 2013). *Accession*: 87–079, 12–343. *Observations*: Nana could be a descriptive term for dwarf, but this clone is distinct and can be segregated from other dwarf selections with a marginal band and stripes. 'Nanus' would be an accurate Latinized name, but cultivar names are not required to be in Latin since 1959. Plants obtained were marketed as 'Nana', not 'Nanus'.

'Nana Variegata'. Weakly creeping groundcover forming clumps 15–18 cm tall. Leaves erect, green variegated, sheaths 2–2.5 cm, blade 11–20 cm long, 2–4 mm wide, veins 11–17; variegation with yellow marginal band 0.2–0.8 mm wide and narrow, vertical, yellowed stripes. Scapes among leaves, 11–16 cm; peduncle flat, 8–13 cm; rachis arching outward, 1.5–3.5 cm, fascicles 5–8, open; bracts 2 mm, foliar bracts 5–10 mm; pedicels 2 mm, buds 4 mm. Flowers nodding, white; perianth 3 mm, perigone 1.5 mm; stamens actinomorphic, subsessile. Fruit not observed. *(O. japonicus).*

Phenology: June. *Origin*: Japan. *Source*: JC Raulston Arboretum Lath House. *Accession*: 13–366. *Observations*: Scarcely indistinguishable from 'Ryu No Higa' that has broader marginal bands that fades to creme-whitish. Possibly should be combined together.

'Nanus'. *Notes*: 3–4 in. × 4–5 in; lilac flowers; used effectively to create a lush carpet of green under evergreen shrubs in commercial plantings; not a fast spreader as the effect was created over time or by using a large number of plants; tufts of leathery, dark green leaves form a thick glossy barrier; occasionally spikes with tiny orchid-like flowers; dark fruits develop in the fall (Joy Creek Nursery, 2013b). *Observations*: Treated herein as an invalid name, marketed commonly as **'Nana'**.

NEW BLUE. Groundcover forming a clump 25–30 cm tall. Leaves shiny dark green, long and narrow. Inflorescences above the foliage. Flowers lavender-violet. Fruit blue.

Phenology: late summer. *Origin*: forest of eastern Asia. *Notes*: Demonstrates a noninvasive, clumping, growth habit 10–12' H (Flowerwood Nursery Inc., 2014). As *L muscari*, gowth in lax, fountain-like, moderately-spreading, vegetatively, clumps with spikes of soft lavender-violet flowers partially masked by the foliage, and followed by dark blue, berry-like fruit; leaves with time can appear weather beaten (Learn2-Grow. 2014b).

'New Orleans'. Semi clumping groundcover to 20–30 cm tall, daughter plants spreading with age. Leaves erect-arching, green, glaucous below, 15–29 cm, 3–7 mm wide, veins 11–13. Scapes 15–29 cm; peduncle green, 17–23 cm; rachis green becoming lavender, 5–9 cm, fascicles 25–35, open; bracts 2–4 mm, foliar bracts not observed; pedicels 2–3 mm; buds light purple. Flowers upturned, bluish-purple; perianth 3 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit green to dark green, 4–5 mm diameter. (*L. spicata*).

Phenology: August. *Origin*: Willis Nursery Co. Inc., "Glen our field forman said that he did not know where this came from—we have had it a long time." *Source*: As *L muscari*, Willis Nursery Company, Inc. *Accession*: 90–152. *Notes*: a moderate growing, grass-like plant with violet colored spikes; excellent for borders and does well in shade to part shade (Willis Nursery Company, 1990). *Observations*: This clone in the research plots was subcaespitose for 3 years, then spreading widely by the fifth year. Leaves were eaten by rabbits.

'New Wonder'. Caespitose groundcover 18–37 cm tall to 10–18 cm spread. Leaves arching outward, green to dark green, weakly glaucous below, 19–46 cm long, 7–10 mm wide, veins 11–17. Scapes among to overtopping leaves, (14–) 21–36 cm; peduncle green becoming purplish, (8–) 14–27 cm; rachis green to lavender-purplish, 6–12 cm, fascicles 30–40, congested, fairly often (1) forming cockscombs 6–20 mm wide apically, or (2) fasciation with 2–7 vertical branches 2–4 cm long; bracts 2–5 mm, foliar bracts light green, (7–11) 25–47 (90–200) cm long × 1–3 mm wide; pedicels 2–4 mm; buds lavender to bluish-purple, 3 mm. Flowers upturned, bluish-purple to dark purple; perianth 3–4 mm, perigone lacking; stamens zygomorphic, stalked. Fruit green becoming black, 5–7 mm diameter, mostly abort. (*L. muscari*).

Phenology: June–August; September. *Origin*: Frederic P. Lee (Hume and Morrison, 1967). *Source*s: Andre Viette Perennials, JC Raulston Arboretum. *Accessions:* 86–023, 89–126. *Observations*: selection with a showy floral visual effect as cockscombs and fasciation are common, occurring in nearly half the scapes. The lower most foliar bract distinctive, often over 90 cm long and 1–3 mm wide.

'Niger'. An invalid name, a synonym name. = **'Nigra'**

'Nigra' (*Ophiopogon nigra* Hort., 'Niger'). Subclumping, mother plants forming a tufted mound 15–17 cm tall × 12 cm spread, daughter plants spaced to 23 cm away from parent plant. Leaves green to purplish-black on parent plants, 15–17 cm long, 4–6 mm wide, veins 7–9. Scapes purple, 7–15 cm, among the leaves: peduncle blackish-purple, 5–8 cm; rachis open, purplish-black, 3–7.5 cm, fascicles 9–10, internodes 4–12 mm, lowermost 20 mm; bracts green to greenish-purple/black. 2–4 mm, foliar bracts 5–7 mm; pedicels black, 3 mm, buds dark lavender. Flowers nodding, pale pinkish tinged light lavender with a dark purple midrib on tepal lobes; perianth 4 mm, perigone 1 mm; stamens actinomorphic, subsessile. Fruit purplish-black, obloid, 7–9 mm long × 5–7 wide. (*O. planiscapus*).

Phenology: June–July; July–September, mostly dispersed during October. *Origin*: Japan. *Source*: As *O. nigra*, Spring Hill Nurseries. *Accession*: 87–054. *Observations*: many daughter plants produced in the third year had green leaves that did not become purplish-black. Most plantlets by the fifth year were green. Slightly smaller form of 'Nigrescens' with shorter leaves and mounding form.

'Nigrescens'. Weak spreading groundcover 25–32 cm tall, daughter plants to 28 cm from parent plant. Leaves green becoming purplish-black, 15–34 cm long, 2–8 mm wide, veins 9–13. Scapes overtopping leaves, 18–25 cm; peduncle purplish-black, 10–17 cm; rachis purplish-black, 4–6.5 cm, fascicles 5–10, open, internodes 4–12 mm, lowermost 8–20 mm; bracts 2–4 mm, foliar bracts 6–9 mm; pedicels 1–3 mm, buds 4 mm. Flowers nodding, 7–8 mm wide, pale lavender to pinkish with a purple central stripe on sepals; perianth 3–4 mm, perigone 1–1.5 mm; stamens actinomorphic, subsessile. Fruit green becoming bluish-black, 6–7 mm on 4 mm pedicels. (*O. planiscapus*).

Phenology: mid-May–July; July–October. *Origin*: Japan. *Source*s: Evergreen Nursery, Fowlers Nursery (from Hines Nursery no. 4387), Maver Nursery, Plant Delights Nursery (from JC Raulston Arboretum). *Accessions*: 86–019, 87–080, 92–177, 02–271. *Observations*: slow grower; new daughter plants with green leaves begin appearing April–May, becoming purplish-black with age. Similar to 'Arabicus', but differs by a smaller perianth with lavender hue.

'Nippon'. Groundcover to 10–20 cm tall × 20–30 cm wide. Leaves straped shape. Flowers whitish. (*O. japonicus*).

Sources: Clemson Cooperative Extension (2012), Folia (2012) Gardenaway (2012). *Notes*: sources reported this Japanese lilyturf or mondo grass as very slow growing, summer bloomer, drought tolerant, and growth in little or no direct sun.

'Okina'. Groundcover forming a clump 25–40 cm tall. Leaves erect, arching outward above the middle, 15–34 cm long, 6–15 mm wide, juvenile leaves whitish over most of surface, becoming green-maculate during the season, veins 15–23 (–45). Scapes conspicuous among leaves, (16–) 24–39 cm, peduncle green, (9–) 16–27 cm; rachis 7–14 cm; fascicles 30–45, open, rarely fasciated, 2–4 branches 1.5–4 cm long; bracts 2–3 mm, foliar bracts not observed; pedicels 2–4 mm, buds lavender to purplish, 2–3 mm. Flowers upturned, purple; perianth 3–4 mm, perigone to 0.5 mm; stamens zygomorphic, stalked. Fruit abort. (*L. muscari*).

Phenology: July–August. *Origin*: Japan, selected by Akira Shibamichi. *Source*: JC Raulston Arboretum no. 95–0596, Plant Delights Nursery (from Shibamichi). *Accessions*: 02–260, Lattier 224. *Notes*: 'Okina' is a very cool selection of the clumping monkey grass that came to us from famed Japanese nurseryman Akira Shibamichi; the top 75% of each leaf is pure white in spring; as 'Okina' matures through the growing season, the white becomes speckled with green flecks, eventually changing to flecked light green by fall, the coloration holds better in cooler climates (Plant Delights Nursery, 2012a). *Observations*: Distinctive, unique clone with 70%–80% of the foliage "bleached" whitish with outer older leaves bearing speckles and blotches of green.

'Original Big Blue'. Invalid name, descriptive to denote affinities with 'Big Blue' from Riegel Nursery. = **'Big Blue'**

'Pam Harper' ('Pamela Harper'). Invalid name, synonym of older name, mis-associated with 'Haku Ryu', =**'Haku Ryu Ko'**

'Paul Aden'. Groundcover to 20 cm tall. Leaves green, variegated with yellow margin. Flowers violet.

Source: As *L. muscari* (Hatch, 2011a). *Notes*: Limited data (Cotsworld Garden Flowers, 2011). *Observations*: The late Paul Aden, Baldwin, NY, was a renowned breeder of *Hosta* cultivars and author of *The Hosta Book*. Unclear if he is the originator of the selection, or it was named to honor him. Apparently in Europe, doubtful in southern United States.

'PDI'. Invalid name derived from shorthand labeling practice for 'Pee Dee Ingot' = **'Peedee Ingot'**

'Pee Dee Gold Ingot' ('Pee Dee Ingot'). Treated as invalid names. Cultivar developed by Ursula Herz, named for the Peedee River in South Carolina. Hatch (2011a) reported that the name originally was published validly in the Coastal Gardens Catalog with four words in the name, Peedee split into two words plus "Gold" in the cultivar name. Herz, in a personal communication with Avent, stated that the catalog was in error, misspelling the river's name and including the foliage's descriptive term gold used in evaluation, before she selected ingot = **'Peedee Ingot'**.

'Peedee Ingot' ('Pee Dee Gold Ingot', 'Pee Dee Ingot', 'PDI'). Groundcover forming clumps 20–48 cm tall, 30–60 cm diameter apically. Leaves erect, to arching above the middle, greenish-yellow (chartreuse), to light green tinged yellow, to creme/light yellow over most of the blade, (22–) 28–46 (–64) cm long, 4–11 mm wide, veins 9–15 (–23). Scapes among the leaves, 24–33 cm, peduncle dark green to purplish tinged above, 17–25 cm; rachis green tinged purple to purple, 5–10.5 cm, fascicles 11–20, open, internodes 4–20 mm; bracts green, 2–3 mm, foliar bracts 5–7 mm; pedicels 2–3 mm, buds purplish, 2.5–3 mm. Flowers upturned, dark lilac to bluish-purple; perianth 3–4 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit black. (*L. muscari*).

Phenology: July–August; September. *Origin*: Ursula Herz, Coastal Gardens (Hatch, 2011a). *Sources*: Clarence Landis (from Coastal Gardens), JC Raulston Arboretum 01–1885 (from Coastal Nursery via Edith Eddleman), Mountain Crop Improvement Laboratory 2010–042 (from Carolina Nurseries), Plant Delights Nursery (from Shady Oaks Nursery). *Accessions*: 91–174, 93–188, 02–256, 12–325, Lattier 108. *Notes*: Foliage fades to a chartreuse-green in late summer; foliage remains bright gold all year with any sun exposure (Plant Delights Nursery, 2012b). *Observations*: Distinctive cultivar with its yellowish foliage, larger size, broader leaves, and purplish flowers. Other yellowish foliage selections are dwarf plants with very narrow leaves.

'Platypus'. Leaves green, weakly glaucous below, 12–15 cm long, 9–12 mm wide, veins 17–23. Scape 13 cm; peduncle green, 7.5 cm; rachis lavender, 5.5 cm, fascicles 26, fasciated with two terminal branches 1–1.5 cm long; bracts 2–3 mm; pedicels lavender, 4–5 mm. Flowers nodding, aborted, 3–5 per fascicle. (*Ophiopogon*).

Phenology: August. *Origin*: (?) Coastal Garden and Nursery, Myrtle Beach, NC. *Source*: As *L. platyphylla*, Clarence Landis (from Coastal Garden). *Accession*: 93–233. *Observations*: One juvenile plant received 31 Aug. 1993 with one inflorescence. Placed in Horticultural Science Greenhouse, but disappeared by early October. Therefore, data are limited. Unable to locate any other source bearing this name.

'Porcupine' (*L. maireri*, 'Maireri'). Tall groundcover forming clumps 25–55 cm tall. Leaves erect, scarcely arching above middle, stiff, medium dark-green, prominently serrate margins, (25–) 40–63 cm long, 1–4 mm wide, veins 5–9. Scapes among leaves, 40–62 cm; peduncle laterally compressed, light green, 36–51 cm; rachis pale lavender, 10–15 cm, fascicles 30–45, open, internodes 6–18 mm; bracts green, 1–3 mm, foliar bracts 7–12 mm; pedicels 1–3 mm; bud lavender, 2–2.5 mm. Flowers upturned, lavender/lilaceous; perianth 2.5–3 mm, perigone 0.5–1.5 mm; stamens zygomorphic, stalked. Fruit black. (*L. graminifolia*).

Phenology July–September; September–October. *Origin*: China, collected by Chen Bing, clone named by Tony Avent. *Notes*: Originally obtained this virtually uncultivated liriope from a grower in China labeled as an *Ophiopogon*; from NCSU researcher Jason Lattier's project, our plant is a true *L. graminifolia*, a clone we named 'Porcupine' with nonrunning clumps composed of very narrow, very stiff, dark green leaves, adorned in September with very attractive flower spikes of lavender flowers and jet black fruit in November (Plant Delights Nursery, 2012c). *Source*: As *Ophiopogon*, Plant Delights Nursery (from Bing, May 2011). *Accession*: 12–322*,* Lattier 228. *Observations*: Labeled as *L. maireri*, the name crossed out with a line through it and 'Porcupine' listed below it. Distinctive newer clumping clone with erect, stiff, narrow, prominently serrate leaves and slender inflorescences with lavender flowers. All *Liriope* have minute marginal teeth, but these are more easily felt. Originally assigned to *L. graminifolia* by Lattier as distinct from *L. muscari* and *L. exilifolia*. A true representative of this species had not been in cultivation before.

'Purple Bouquet'. Caespitose groundcover to 20–35 cm tall. Leaves erect, green to dark green, weakly ribbed above, weakly glaucous below, 19–37 cm long, 7–18 mm wide, veins 13–21 (–41). Scapes among leaves to above foliage, 18.5–32 cm long; peduncle compressed-terete, green becoming purplish, 14–25 cm long; rachis lavender, 4–7.5 cm long, fascicles 20–30, congested, internodes 3–6 mm long, occasionally 1) forming a cockscomb 2–7 mm wide apically, or 2) fasciated with 2–6 terminal ascending branches 0.7–3.5 cm long; bracts 2–4 mm, foliar bracts not observed; pedicels 2 mm,

buds purple, 2–3 mm. Flowers upturned, dark purple, 3–5/fascicle; perianth 3–4 mm, perigone lacking to 0.4 mm; stamens zygomorphic, stalked. Fruit deep blue to black, 6–8 mm diameter. (*L. muscari*). *Phenology*: July–August; September–October. *Origin*: Thomasville Nurseries. *Sources*: Evergreen Nursery, JC Raulston Arboretum (from Thomasville Nurseries). *Accessions*: 86–027, 87–048. *Observations*: Attractive clumper with dark green leaves with congested rachises above the foliage with purple flowers and occasionally exhibiting a narrow cockscomb and/or fasciation.

PURPLE EXPLOSION ('EXC 052'). Clumping groundcover 40–50 cm tall, 40–50 cm wide. Leaves erect, arching outward, green, 20–40 cm long, 5–15 mm wide. Scapes strong and long, 15–20 cm; rachis with 150–200 flowers; pedicels 4–6 mm; buds 4–6 mm. Flowers upturned, violet; perianth 5 mm. (Liriope).

Phenology: Summer–autumn in Netherlands. *Origin*: A mutation of 'Moneymaker' discovered in June 2005 by External Plant Boijl B.V., The Netherlands. *Source*: *L. muscari* '*EXC 052*', IFI Claim Patent Services (2012a). *Notes*: Differs from 'Moneymaker' by the following characteristics: larger plants, longer scapes, more and darker flowers, and tolerant to lower temperatures (IFI Claim Patent Services, 2012a). *Observations*: US PP 21352 issued 28 Sep. 2010.

'Purple Passion'. Groundcover 20–30 cm tall. Leaves green, 20 cm long. Scapes dark, 15 cm. Flowers profuse, dark purple. Labeled as *L. muscari*.

Phenology: August–October, Europe. *Source*: *Liriope* 'Purple Passion', Handelskwekerij Exceptio (2013c). *Observations*: Inquiry received from Louisiana regarding this as a possible alternative name for 'Purple Bouquet'. 'Purple Passion' does not appear to be in U.S. trade.

'Pygmaeus'. Creeping dwarf groundcover forming tufts 5–10 cm tall. Leaves erect, dark green, short, narrow. Scapes short. Flowers violet. Fruit glossy, dark purple.

Phenology: Unknown. *Origin*: (?) *O. bodinieri* var. *pygmaeus*. *Sources*: As *O. japonicus* 'Pygmaeus', Avant Gardens (2012), Denver Botanic Gardens (2013). *Notes*: Slow growing; great for troughs, dish gardens and bonsai companion planting; USDA zone 5 (Denver Botanic Gardens, 2013). Resembles a tiny *Liriope*, forming tall tufts of narrow green leaves, can have a charmingly geometric effect when used in mass (Avant Gardens, 2012). *Observations*: Wang and Dai (1978) assigned var. *pygmaeus* to *O. bodinieri* H. Lév. (The International Plant Name Index, 2013). In the United States, a distinctive dwarf with purple flowers and purple fruit.

'Quail Garden'. Small creeping groundcover. Leaves erect, arching above the middle, green variegated, 25–38 cm long, 3–6 mm wide, veins 11–13; variegation with a gold to creme marginal band and longitudinal stripes. Scapes among the foliage, 24–25 cm; peduncle 15.5–16.5 cm; rachis 8–8.5 cm, fascicles 20–21, open, internodes 6–9 mm; bracts green medially with whitish 1–1.5 mm wide phlanges, 4 mm long, foliar bracts not observed; pedicels 2–3 mm, buds 3 mm. Flowers upturned, 1–3 per fascicle; perianth 3–4 mm, perigone 1 mm; stamens zygomorphic, stalked. Fruit not observed. (*L. spicata*).

Phenology: July. *Origin*: Carolina Nurseries. *Source*: as *L. muscari*, Mountain Crop Improvement Laboratory 2010–013 (from Carolina Nurseries). *Accession*: Lassiter 121. *Observations*: Carolina Nurseries out of business. Data limited, from one voucher by Lattier.

'Regal'. Weakly spreading groundcover forming loose clumps 25–32 cm tall, daughter plants 3–7 cm from parent, becoming invasive with age. Leaves erect, green, weakly glaucous below, 28–41 cm long, 3–9 mm wide, veins 5–7. Scapes 21–33 cm; peduncles laterally compressed, (12–) 19–25 cm; rachis 6.5–11 cm, fascicles 23–27, loose, internodes 6–13 mm; bracts 2–4 mm, foliar bracts not observed; pedicels 2–4 mm; buds 2–3 mm. Flowers upturned, bluish-purple; perianth 3–4 mm, perigone 1 mm; stamens zygomorphic, stalked. Fruit abundant, green becoming black, 4–6 mm. (*L. exiliflora*).

Phenology: June–August; August–September, persistent through winter. *Origin*: Garden Place. *Source*: As *L. muscari*, Garden Place. *Accession:* 86–007. *Observations*: Similar to 'Tidwell Big Blue'.

'Rocket'. Weakly creeping groundcover 25–32 cm tall. Leaves green to dark green, weakly glaucous above, 28–38 cm long, 4–8 mm wide, veins 17–19. Scapes among top of leaves, green, 22–32.5 cm; peduncles laterally compressed, dark green to green, 16–21.5 cm; rachis green tinged light lavender to lavender, 6–14 cm, fascicles 35–47, open, internodes 7–10 mm, rarely 1) with a basal lateral branch to 2.5 cm long, or 2) with terminal fasciation, branches 8–12 mm long; bracts 3 mm, foliar bracts 5–6 mm; pedicels 2–4 mm; buds lavender to lilaceous-purple. Flowers light purple; perianth 3 mm, perigone 0.5 mm; stamens zygomorphic, stalked. Fruit green to dark green, becoming black, 4–5 mm diameter. (*L. exiliflora*).

Phenology: mid-July–September; September–October. *Origin*: Clarence Landis, grown from seed in 1989. *Source*: Clarence Landis. *Accession*: 91–171. *Notes*: Landis claimed a female 'Lilac Beauty' × male 'Christmas Tree' hybrid (personal communication 13 May 1993). *Observations*: Three plants were received in a vegetative state during 1992. Plant A was dead by spring 1993, and the other pair flowered over several years. Apparently not in nursery/landscape trade.

'Rocket Giant'. Scape 50 cm; rachis 23 cm, open; bracts 5 mm. Flowers upturned, violet; stamens zygomorphic, stalked.

Phenology: May. *Source*: Clarence Landis, 23 May 1993, as Rocket Giant with only a detached inflorescence. *Observations*: Landis reported the inflorescence was from 'Rocket', but a giant inflorescence was never observed in 'Rocket' plants obtained from Landis in 1991, and grown for several years in research plots. The inflorescence matches selections of *L. platyphylla*. Treated as an invalid name based on a descriptive identification and misidentification error by Landis.

'Royal Purple'. Caespitose groundcover to 30–40 cm tall, 12–14 cm diameter. Leaves erect to arching near middle with age, green, weakly ribbed above, weakly glaucous below, 25–46.5 cm long, 4–21 mm wide, veins 9–23. Scapes hidden among the leaves, more conspicuous toward clump perimeter, 20–30 (-38) cm; peduncle compressed-terete, green becoming purplish, 14–23 cm; rachis purplish basally, bluish-white apically, (4–) 10–15 cm, fascicles 25–56, congested, sometimes 1) forming a cockscomb 7–12 mm wide apically, and/or 2) fasciated with 2–5, rarely 8–11 terminal branches 1–3 mm long; bracts 2–4 mm, foliar bracts 6–41 mm; pedicels 1–3 mm; buds light to dark purplish, 3–4 mm. Flowers upturned, bluish-purple to dark purple, 5–9 per fascicle; perianth 4 mm, perigone lacking; stamens zygomorphic, stalked. Fruit rare, green to bluish-black, 5–6 mm diameter, most aborting. (*L. muscari*).

Phenology: July–September; October. *Origin*: Unknown, from SC (Adams, 1980). *Sources*: Andre Viette, Carroll Gardens, Evergreen Nursery, LA Nursery. *Accessions:* 86–024, 87–067, 88–110, 90–143. *Observations*: More flowers per fascicle along with some cockscombs and fasciation, make this clone very attractive florally. Flowers a darker hue than similar clone 'Lilac Beauty'.

'Ryu No Higa'. Spreading groundcover 12–18 cm tall. Leaves erect, arching outward, dark green variegated, 12–24 cm long, 2–6 mm wide, veins 5–9; variegation with yellow to creme-whitish marginal band 1–2 mm wide and 1–2 vertical stripes near middle. Scapes 13–20 cm; peduncle flat, green to whitish apically, 10.5–16 cm, phlanges whitish; rachis arching outward, whitish, 2.5–5 cm, fascicles 5–7, open, internodes 6–11 mm; bracts 2–4 mm, foliar bracts 5–8 mm; pedicels 1–2 mm. Flowers nodding, whitish tinged pale pink; perianth 3–4 mm, perigone 1 mm; stamens actinomorphic, subsessile. Fruit oblong, blue, 5 mm long × 3 mm wide, skin rupturing exposing white seeds. (*O. japonicus*).

Phenology: July. *Origin*: Japan, imported to the United States by Ozzie Johnson. *Source*: Plant Delights Nursery (Oct. 1995 from Ozzie Johnson). *Notes*: Wikipaedia (2013b) cited Japanese names ryu-no-higa (dragon's beard) and ja-no-higa (snake's beard) with their English translation as vernacular names for the genus *Ophiopogon*. *Accession*: 02–268. *Observations*: Not clear if Johnson meant to use name as a descriptive term or a cultivar name. Plant Delights Nursery database denotes it is a 'Haku Ryu Ko'. However, this accession was dwarf in size with slightly larger flowers borne on longer pedicels. Treated herein as a distinct cultivar to designate this clone from other dwarf variegated cultivars assigned to *O. japonicus*. However, scarcely indistinguishable from 'Nana Variegata' which

has narrower yellow marginal bands and white flowers.

'Samantha'. Groundcover forming loose clumps (15–18) 30–45 cm tall, 20–34 cm spread, daughter plants 2–8 cm away from parent plant, 20–28 cm from parent plant with age. Leaves erect to arching outward, green to dark green, rarely twisting 0.5–1 turn, 25–40 cm long, 6–13 mm wide, veins 7–17, ribbed above. Scapes numerous, conspicuous among foliage apex to overtopping leaves, 17–34 cm; peduncle compressed-terete, green, 15–24 cm; rachis greenish-white to tinged pale lavender-pink, 5–12 cm, fascicles 27–44, open, internodes 3–9 cm, rarely with ascending, basal lateral branch 3–5 mm long; bracts green, 3–5 mm, foliar bracts green, (7–20) 35–210 mm long × 2–6 mm wide; pedicels whitish, 2–4 mm; buds 2–3, whitish tinged pink to pink. Flowers upturned, light pink to pink to pinkish-lavender; perianth 3.5–4 mm, perigone to 0.5–0.7 mm; stamens zygomorphic, stalked. Fruit green becoming black, 6–8 mm diameter, very rarely with foliar bracts present. (*L. exiliflora*).

Phenology: June–August; August–September. *Origin*: Unknown. *Source*s: As *L. muscari*. Andre Viette Perennials, Evergreen Nursery (from Doug Young Nursery, Forest Hills, LA), Louisiana Nursery. *Accessions*: 86–026, 87–068, 88–102, 88–106. *Observations*: Excellent clone for massing with numerous scapes and conspicuous pink buds and flowers above the foliage followed by black fruit.

'Samona'. Large clumping groundcover 20–40 cm tall. Leaves erect, arching near apex, medium dark green, 35–56 cm long, 7–17 mm wide, veins 15–19 (–31). Scapes 25–44 cm; peduncles green, 16–34 cm; rachis 7–12 cm, fascicles congested with buds, multilaterally branched from base to apex forming a narrow columnar shape, lateral branches 12–40 mm long; bracts hidden, 2–3 mm, foliar bracts not observed; pedicels hidden, 2–3 mm; buds pinkish-purple, 2–4 mm, often drying and persisting. Flowers upturned, pinkish-lavender, rarely opening, then only very slightly. Fruit lacking. (*L. muscari*).

Phenology: July–August. *Origin*: Unknown, possibly a selected member of 'Christmas Tree'. *Source*: JC Raulston Arboretum 09–0102, Mountain Crops Improvement Laboratory no. 2011–143. *Accession*: 12–371, Lattier 203. *Observations*: Similar to 'Christmas Tree', but bearing larger, more conspicuous scapes.

'**Sapphire Snow'**. Dwarf spreading groundcover, 13–15 cm tall. Leaves dark green, variegated, 11–18 cm tall, 1–2 mm wide, veins 3–7; variegation with pale yellow-creme margins and stripes. Scape conspicuous among foliage, 10.5 cm; peduncle 7 cm; rachis arching outward, 3.5 cm, fascicles 6, open; bracts 2 mm, foliar bracts 5–6 mm; pedicels 3 mm; buds 3–4 mm. Flowers nodding, pale lavender; perianth 5–6 mm, perigone 1–2 mm; stamens actinomorphic, subsessile. Fruit not observed. (*O. japonicus*).

Phenology: June. *Origin*: Japan. *Source*: Plant Delights Nursery (from Barry Yinger, Sept. 2010; from Michael Vaughn, June 2012). *Accession*: 13–362. *Observations*: Yinger's bib was planted in the Lady Bank's Wall bed; struggling with no inflorescences produced. Vaughn's bib was planted in *Abies concolor* bed; exhibited new growth and one inflorescence; thus quantitative descriptive data limited.

'Seoulitary Man'. Groundcover forming a tight, dense clump 18–22 cm tall, spreading to 100 cm wide, daughter plants 0.5–1 cm from parent plant. Leaves erect, arching apically, green, darker near apex, 17–24 cm long, 1–3 mm wide, veins 5–7. Scapes hidden among the leaves, 6–7 cm; peduncle 5–5.5 cm; rachis arching outward, 0.5–1 cm, fascicles 2–3, open; bracts 2 mm, foliar bracts not observed; pedicels 2 mm. Flowers nodding, pale lavender; perianth 3 mm, perigone 1 mm; stamens actinomorphic, subsessile. Fruit bright blue. (*O. japonicus*).

Phenology: Late spring; fall. *Origin*: Top of Ulleung Island, Korea, collected in 1997 by Tony Avent. *Source*: Mountain Crops Improvement Laboratory 2010–057 (from Carolina Nurseries). *Accession*: Lattier 119. *Notes*: Fruit description (Sandy's Plants, Inc., 2013). Data were supplemented by the photo and marketing description; has great potential for the woodland garden where a running mondo is not acceptable (Plant Delights Nursery, 2010c). Plant Delights Nursery database denoted 'Seoulitary Man' as *O. japonicus* var. *caespitosus* Okuyuma.

'Sheffield'. Broad caespitose clumper 25–30 cm tall. Leaves erect, arching, green, 18–38 (–47) cm long, 6–18 mm wide, veins 17–23. Scapes among leaves, 20–37 cm; peduncle green becoming purplish, 15–27 cm; rachis green, 5–10 cm, fascicles 17–21, semi-crowded, internodes 2–5 mm; bracts 2–3 mm, foliar bracts not observed; pedicels 2–3 mm, buds purplish, 2–3 mm. Flowers upturned, dark purple; perianth 3–4 mm, perigone lacking to 0.5 mm; stamens zygomorphic, stalked. Fruit green, 3 mm diameter, commonly abort. (*L. muscari*).

Phenology: June–August; August–September. *Origin*: Riegel Nursery. *Source*: Clarence Landis (from Riegel Nursery). *Accession*: 87–039. *Observations*: Similar to 'Purple Bouquet'. Apparently no longer in nursery trade.

'Shiroshima Ryu'. Spreading dwarf groundcover forming a tufted mound(s) with age, 6–12 (18) cm tall, daughter plants 1–5 cm from parent plant to 5.5–15 cm away with age. Leaves erect, arching outward about half its length, green variegated, 8–20 cm long, 1–3 mm wide, veins 3–7; variegation with white marginal band 0.5–1.5 mm wide and vertical stripes to 1 mm wide over nearly half of the surface. Scapes hidden among leaves, inconspicuous, 3.5–9.5 cm; peduncle pale green to green, flat, 3–9.5 cm; rachis arching outward, pale green becoming whitish, 3–7.5 cm, fascicles 3–6, open, internodes 2–6 mm; bracts green, 3–4 mm, foliar bracts 6–9 mm; pedicels 1–2 mm; buds 2–3 mm. Flowers nodding, subwhitish with pale pinkish/light lavender tinge; perianth 3–4 mm, perigone 1–2 mm. Fruit rare, green to dark green surrounded at base by perianth tube, to 4 mm diameter, typically aborting. (*O. japonicus*).

Phenology: June–July; August–October. *Origin*: Ishisuro Nursery, Japan. *Source*: Carroll Gardens (from Ishisuro), Brookside Gardens no. 1404 (from Ishisuro momiji-en, Japan), JC Raulston Arboretum no. 03–0279, Plants Delight Nursery. *Accession*: 86–017, 91–167, 02–275, 12–331, 12–344. *Notes*: Scapes commonly lacking in August–September, but if persisting, bearing fruit. *Observations*: Dwarf mounded groundcover grown for its showy, striking whitish foliage, brightening areas in the landscape when used. Described sometimes as white flowered; however, flowers are pigmented tinged. Only one daughter plant in 1993 was entirely green, nonvariegated.

'Shiro Tama Hime'. Leaves green variegated with white marginal band and thin stripes.

Origin: Japanese nursery, brought to the United States by James Waddick, KS City, MO. *Source*: As *Ophiopogon*, JC Raulston Arboretum no. 90–0197 (from Waddick). *Accession*: 90–134 *Notes*: Name Shiro refers to a person that is a beautiful princess or goddess, possibly named for the mythological Toyotama-hime, the beautiful daughter of Ryujin, the god of the sea. She married the hunter Hoori and gave birth to a son, who in turn produced Emperor Jimmu, the first Emperor of Japan. After giving birth, she turned into a dragon and flew away (*Ophiopogon* = dragon's beard). *Observations*: Observed briefly in Lath House, Fantz waited until spring for flowering and taking data. However, plant disappeared before flowering.

'Sideswiped'. Groundcover forming clumps, 25–35 cm tall. Leaves erect, slightly arching, green, variegated 22–38 cm long, 3–9 cm wide, veins 11–21, ribbed above; variegation at leaf middle toward apex with irregular, yellow, transverse to semitransverse blotches 10–25 mm deep vertically. Scapes above foliage, 25–33 (49–53) cm; peduncles compressed-terete, green, 16–23 (–32) cm; rachis greenish-lavender, 6–12 (18–21) cm, fascicles 25–36, open, lowermost internodes 6–15 mm, rarely fasciated with two terminal branches 2–4 cm long; bracts 2–3 mm, foliar bracts 6–8 mm; pedicels 2–3 mm; buds 2 mm. Flowers upturned, lavender; perianth 3 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit shiny black, 7–10 mm. (*L. muscari*).

Phenology: July. *Origin*: Plant Delights Nursery, seedlings of 'Hawk's Feather' sown 1990; best plant selected in 2000. *Source*: Plant Delights Nursery. *Accessions*: 12–326, Lassiter 122. *Notes:* The upright, dark green leaves are heavily banded with wide horizontal yellow bands, most prominent on the new growth, topped with short stalks of lavender flowers in midsummer (Plant Delights Nursery, 2012d). *Observations*: Similar to 'Hawks Feather', but bearing wider horizontal bands and flowers of lighter hue.

'Silver Banded'. Groundcover forming low compact clumps. Leaves green, variegated with narrow yellowish marginal band fading to creme-white to white, becoming green with age. Scapes numerous among the leaves; rachis fascicles numerous, open. Flowers dark bluish-violet; perigone 1 mm. (L. exiliflora).

Phenology: Summer. *Origin*: Unknown. *Source*: As *L muscari*, Hume (1961), Hatch (2011a). *Notes*: Slow growing (Hume, 1961). *Observations*: Hume (1961) cited a 1 mm projection above the pedicel. This is the floral perigone, indicating clone is not *L. muscari*, but probably *L. exiliflora*. Fantz was unable to locate a planting in the Lath House of the JC Raulston Arboretum, informed that it had been stolen. Unable to locate any other source of clone. Apparently not in the U.S. market.

'Silver Dragon'. ('Ariaka-janshige', 'Ariake-janshiga', 'Gin Ryu', 'Silvery Dragon'). Rampant spreading groundcover colonizing a broad area with age, 14–25 cm tall, daughter plants to 10–19 cm from parent plant. Leaves arching near base, green variegated, 22–60 cm long, 4–13 mm wide, veins 9–13; juvenile nearly all white with few vertical green stripes 0.5–1 mm wide, maturing to green with white-silvery marginal bands 2–7 mm wide and green vertical stripes 0.3–3 mm wide, oldest leaves nearly all green. Scapes 17–36 cm; peduncles compressed-terete, green to tinged purplish, 9–23 cm long, rachis greenish-white, 7–14 (–19) cm long, fascicles 23–40, open, internodes 8–12 mm long below and 4–8 mm above, very rarely with two additional, erect basal rachises 2.5–3.5 cm long; bracts 2–3 mm, foliar bracts 7–40 mm, rarely 100–150 mm; pedicels 2–3 mm; buds lavender, 3 mm. Flowers upturned, pale pinkish to lavender to bluish-purple, 1–3 per fascicle; perianth 3–4 mm, perigone to 1 mm. Fruit green, globular, 7–9 mm diameter, rupturing to expose whitish seeds, rarely light bluish-speckled maculate, lower third to half with green-brownish skins. *(L. spicata)*.

Phenology: July–September; August–October. *Origin*: Japan. *Sources*: As *L. spicata*, Evergreen Nursery, JC Raulston Arboretum (from Malloy's Nursery), Louisiana Nursery, Powell Gardens; *as L. muscari* 'Silvery Sunproof'. Louisiana Nursery. *Accessions*: 85–004, 87–046, 87–076, 89–107, 89–122, Lattier 109. *Observations*: Distinctive clone for its rampant growth and white bands and margins over half its leaves. Forms a nice ''premowed'' grassy groundcover, excellent around trees or shrubs. Lavender flowers and white seeds add a seasonal bonus display. Sprinkles of blue spots in the seeds occur rarely, not every year, but unique in cultivated liriopogons.

'Silver Midget'. Invalid name, an orthographic variation. = **'Silvery Midget'**

'Silver Mist'. Trade name for Kigimagurkidoma (Pacifica, 2013). Synonym of 'Kigimatfuduma' (Hatch, 2011b). We have seen this plant as 'Silver Mist' or the Japanese name spelled as 'Kigimafurkidoma', 'Kijimafukiduma' and 'Kigimasfukiduma' (San Marcos Growers, 2013b). *Sources*: As *O. japonicus*, Clarence Landis, Hines Nursery. *Accessions*: 90–128, 91–172. *Observations*: An older name exists. Possibly renamed for U.S. markets as Japanese name difficult to pronounce and spell. 'Silver Mist' data agreed with 'Kigimafukiduma' description. = **'Kigimafukiduma'**.

'Silver Ribbon'. Groundcover to 25 cm tall × 30 cm spread. Leaves silver. *Notes*: Hatch (2011b) cited it listed as *O. planiscapus* with Water Meadow Nursery, Airesford, Hampshire, U.K. Folia (2013) cited growth size. Bristlecone (2012) cited foliage color, but as *O. jaburan*. *Observations*: 'Silver Ribbon' difficult to locate, listed with nurseries in New Zealand as *O. planiscapus*. Apparently not in the U.S. trade.

'Silver Shower'. Dwarf creeper forming tufts to 12–15 cm tall. Leaves erect, arching outward 3–5 cm above base, green variegated, 20–32 cm long, 4–11 cm wide, veins 9–17; variegation with brief yellowish-creme, maturing to white marginal bands 0.5 mm wide and 0.5 mm wide white stripes. Scapes among leaves, conspicuous, 11–20 cm; peduncles flat, green with dark green striations to slightly tinged purplish, 5–11 cm; rachis arching outward, green to whitish-green apically, 6.5–14 cm, fascicles 23–37, open, internodes 2–14 mm; bracts 3–6 mm; pedicels greenish-white, 2.5–4 mm; buds white, 2–4 mm. Flowers nodding, white, 1–3 per fascicle; perianth 4–5.5 mm, perigone 1–2 mm; stamens subsessile, actinomorphic. Fruit aborted, not observed. (*O. intermedius*).

Phenology: June–July. *Origin*: Unknown. *Source*: As *O. japonicus*, Hines Nursery. *Accession*: 89–127. *Notes:* Occasionally cited as *O. jaburan* (Bristlecone, 2012). *Observations*: Fantz (2009) provided a key segregating these species. Floral data agree with lesser known *O. intermedius*. Plants weakly cold hardy in Raleigh area, all bibs were dead within 2–4 years. Striking plant with variegated green and white striped leaves, conspicuous scapes with numerous white nodding flowers.

'Silver Sunproof'. Invalid name, an orthographic variation = **'Silvery Sunproof'**.

'Silver Vein'. Small spreading groundcover to 35 cm tall. Leaves green variegated, 15–23 cm long, 0.7–2 mm wide, veins 3–5; variegation with whitish marginal band 0.2–0.4 mm wide and narrow stripes. Inflorescences and fruit not observed.

Phenology: Unknown. *Origin*: Unknown. *Source*: As *O. japonicus*, J.C. Raulston Arboretum Lath House. *Observations*: Vouchered vegetatively early Dec. 2003. Plant dead by spring. No other sources with this name have been located.

'Silvershine'. *Source*: As *O. planiscapus*, 1999 RHS Plant Finder (Hatch, 2011b). *Observations*: Unable to locate any other source with this name. Apparently not in U.S. trade.

'Silvery Dragon'. Invalid name, an orthographic variation = **'Silver Dragon'**.

'Silvery Midget' ('Silver Midget'). Dwarf groundcover forming a mound 13–20 cm tall, 7–12 cm wide. Leaves erect, arching outward, green variegated, (12–) 18–32 cm long, 6–15 (–23) mm wide, veins 9–15; juvenile yellowish becoming dark green with yellow marginal band 1–5 (–10) mm wide, becoming creme with age, rarely silvery. Scapes among to slightly overtopping leaf tops, (11–) 15.5–19.5 cm; peduncle purplish-green, 8.5–17 cm; rachis erect, light purplish to green apically, 3–8 cm, fascicles 30–38, semicrowded, internodes 2–10 mm, rachis 1) sometimes fasciated with 2–4 branches 2–6 mm long or 20–25 mm long, or 2) rarely with a lateral branch above the middle 1.5–2 cm long; bracts 2–4 mm, foliar bracts 6–10 mm; pedicels whitish, 1–3 mm; buds lavender becoming purplish, 2–3 mm. Flowers upturned, purple; perianth 3–4 mm, perigone lacking to 0.5 mm; stamens zygomorphic, stalked. Fruit green, 4–8 mm diameter, commonly aborting. *(L. muscari)*.

Phenology: July–August; September–October. *Origin*: Riegel Plant Company (Adams, 1980). *Source*s: Andre Viette Perennials, Clarence Landis (from Riegel Nursery), Evergreen Nursery. *Accessions*: 86–025, 87–047, 87–069. *Observations*: Despite its name, the marginal band is more golden yellow, not silvery. Similar to a smaller 'Sunproof'. Dwarf mounding plant with yellow-banded variegation and late summer purple flowers, often with fasciation.

'Silvery Sunproof' ('Silver Sunproof'). Spreading groundcover forming clusters 15–35 cm tall, to 30–40 cm spread. Leaves erect, glaucous below, dark green variegated, (15–) 22–46 cm long, 6–20 mm wide, veins (9–) 13–27, ribbed above; variegation with a golden yellow marginal band 0.5–3 mm wide, fading to creme to whitish, becoming green with age, occasionally with vertical stripes 0.5–1 mm wide. Scapes 26–46 cm; peduncles compressed-terete, green becoming purplish, (13.5–) 22–32 cm, rachis lavender to purplish, 8–18 cm, fascicles 35–45, open, internodes 3–13, sometimes either 1) forming a cockscomb 8–15 mm wide apically, or 2) fasciated with 1–3 branches 0.5–1.7 cm long, or occasionally 3) bearing above the rachis middle an ascending lateral branch 2–4.5 cm long; bracts 3–4 mm, foliar bracts green, 5–10 mm; pedicels whitish tinged purple, 2–3 mm long; buds dark purple, 2–3 mm. Flowers upturned, purple to dark purple; perianth 3–4.5 mm long, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruits to 6 mm, greenish-brown. *(L. exiliflora)*.

Phenology: June–August; September–October. *Origin*: Unknown. *Source*: As *L. muscari*, Carroll Gardens, Evergreen Nursery. *Accessions*: 86–013, 87–070, 90–144, Lattier 104. *Observations*: Yellow variegation more prominent on new growth in spring, silvery-white color appearing later in season. Similar to 'Variegata', but taller and more robust. Leaves were a favorite of rabbits. May be a marketed version of Japanese 'Ariaka-janshige', an older name.

'Sno Cone'. Slow creeping groundcover forming clumps 30–40 cm tall × 30–45 cm wide, daughter plants to 21 cm away from parent plant. Leaves erect to arching outward

with age, light green variegated, (18–) 28–44 cm long, 7–12 (–19) mm wide, veins 13–21 (–45); variegation bleached whitish, weakly mottled below, occasionally with green vertical stripes. Scapes 30–32 cm; peduncles green, 21–22 cm; rachis 9–10.5 cm, fascicles 14–18, open, internodes 6–18 mm; bracts 2 mm, foliar bracts not observed; pedicels 2–3 mm; buds lilac to purplish, 2–3 mm. Flowers upturned, purplish, 1–3 per fascicle; perianth 3–4 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit green becoming purplish-black, occasionally whitish mottled green, to 8 mm diameter. *(L. exiliflora*).

Phenology: June–August; September. *Origin*: Discovered in 1988 by John E. Elsley in his garden at Greenwood, SC, as a ''mutation of *L. muscari*.'' U.S. plant patent no. 20605 issued 22 Oct. 2009. *Notes*: Spreads 91 cm in 20 years; foliage strongly recurved, green and white with white coloration increasing with leaf maturation; ornamental globular berries 8 mm in diameter, uniquely colored with a mottled pattern of dark purple, green and white; differs from 'Okina' by being taller, having a more vigorous growth habit, broader foliage strongly recurved, and maintains its white coloration throughout the growth season (ItSaul Plants, 2009). *Source*s: As *L. muscari*, Plants Delight Nursery (from Ozzie Johnson, Dec. 2008), US PP20605 P2 (ItSaul Plants, 2009). *Accession*: 12–327. *Observations*: The mottled fruit are remnants of a ruptured seedcoat exposing the whitish seeds, similar to the pattern observed in 'Silver Dragon'.

'Snow Dragon'. Small groundcover forming clump 20–30 cm tall. Leaves erect, green to medium dark green, 21–31 cm long, 3–11 mm wide, veins 15–23. Scapes overtop the leaves, 30–37 cm; peduncles compressed-terete, 23–25 cm; rachis 7–13.5 cm, fascicles open, 18–35, internodes 8–12 mm; bracts 2–3 mm; pedicels 2–3 mm. Flowers upturned, perianth 3.5–4 mm, perigone 1 mm; stamens zygomorphic, stalked. Fruit dark green, 3–5 mm diameter. (*L. exiliflora*).

Phenology: July–August. *Origin*: Japan. *Source*: As *Liriope*, Plant Delights Nursery (from Carolina Nurseries, Feb. 2007). *Accession*: 12–358, Lattier 205. *Observations*: Data limited from two vouchers collected July 2012. Computer records cited planted in *Tsuga* 'Gentsch White' bed, but located neither in spring nor in summer of 2013.

'Sparkler'. Creeping groundcover to 9–15 cm tall, spreading to 30 cm wide. Leaves erect to arching, bright green maturing dark blue-green, lighter below, long and narrow. Scapes among leaves. Flowers white. Fruit iridescent blue.

Phenology: Summer; fall. *Origin*: Japan, named for sparkling white flowers. *Source*: As *Ophiopogon* or *O. chingii*, Fairweather Gardens (2013), Miniature Garden Shoppe (2013), Plant Haven (2013). *Notes*: Midsized cultivar of these clumping grass-like evergreen perennials native to Japan; white bell-shaped flowers appear in loose clusters at the end of short upright or arching stalks in summer; a thick, tall, turfy groundcover, spreading by long rhizomes and is useful in a mixed border for its grassy look (Learn2-Grow, 2013c). Sturdy and vigorous, yet it reaches only 4–6 inches tall, ideal for edging in small or miniature gardens (Fairweather Gardens, 2012). Grows at a slow to moderate rate and is not considered to be an aggressive spreader; patent status is PPAF (Plant Haven, 2013). Sun to bright shade and very adaptable; cold hardy to zone 5 (Miniature Garden Shoppe, 2013). *Observations*: Newer selection not in original study. 'Sparkler' was assigned to *O. japonicus* originally, and then assigned to *O. chingii.* Cultivated *O. chingii* plants in the United States currently identified as *O. umbracticola*.

'Spotted Tiger'. Dwarf spreading groundcover 9–17 cm tall, daughter plants 4–18 cm from parent. Leaves erect, medium dark green variegated, 8–20.5 cm long, 1–3 mm wide, veins 3–5; variegation with some bearing irregular, transverse, yellowish patches near apex, patches 1.5–9 cm depth on leaves. Inflorescences not observed.

Phenology: Unknown. *Origin*: Unknown. *Source*: As *O. japonicus*, Plant Delights Nursery (from Nature's Curosity Shop). *Accession*: 13–359. *Observations*: Young bibs, thus, no inflorescences had been produced. Spreading groundcover with darker green leaves and irregular splashes of yellow toward the apex, but not forming a mass as gaps in planting from spaced daughter plants. Similar to 'Torafu'.

'Spring Gold'. Spreading groundcover to 10–15 cm tall. Leaves golden yellow to greenish-yellow to green. Flowers nodding, lilac to deep purple.

Phenology: July–August. *Origin*: Monksilver (Hatch, 2013b), Monksilver Nursery, Cottenham, Cambridge, U.K. *Sources*: As *Ophiopogon* (Hatch, 2013b; Priola, 2013). *Notes*: Slow grower (Hatch, 2013b). *Ophiopogon japonicus* 'Spring Gold' is a perennial, evergreen, foliage yellow-green; flower is lilac (Priola (2013). *Observations*: Newer selection not examined in original study and apparently not in U.S. trade.

'Summer Beauty'. Spreading groundcover forming clumps to 40 cm tall, 40 cm wide. Leaves erect to arching near middle or below, yellowish-green, 15–21 cm long, 9–15 mm wide. Scapes numerous, showy, overtopping leaves, 10–13 cm; rachis forming a cockscombs most of its length, fasciation not observed; buds bluish-purple. (*L. exiliflora*?).

Phenology: Summer. *Origin*: Ursula Mueller, Queensland, Australia, as a sport of 'Moneymaker'. *Sources*: Hatch (2011a), Spektrum Culture (2013). *Notes*: More densely clumping and vigorous than 'Moneymaker' or 'Big Blue' (Hatch, 2011a). *Liriope* produced in vitro, protected by PBR and can only be reproduced by an aurithorized agent (Spektrum Culture, 2013). Photos exhibit showy rachises with cockscombs nearly their entire length. *Observations*: Not examined in this study, nor believed to be in U.S. trade.

'Sunproof'. Small clustering groundcover 20–35 cm tall, 15–17 cm basal spread. Leaves erect, slightly arching near apex, green to medium dark green, variegated, (13–) 24–32 (–37) cm long, 6–18 mm wide, veins conspicuous, 11–19; variegation with narrow to broad golden-yellow to creme marginal bands, 2–8 mm wide, occasionally with vertical stripes 0.5–2 mm wide, losing variegation with seasonal age, becoming green. Scapes hidden among leaves, (6.5–) 11–18 (–25) cm; peduncle green becoming purplish, (5.5–) 9–18.5 cm; rachis much shorter than peduncle, tinged to light purple, (2–4) 5–9 cm, fascicles 30–35, crowded, 1) rarely forked above peduncle to form two ascending rachises 2.5–4 cm long, 2) more frequently forked toward apex with 2–3 branches 1.5–4.5 cm long, apex resembling a trident or narrow victory sign, or 3) occasionally fasciated with 2–4 terminal branches 0.7–2.5 cm long; bracts 2–3 mm, foliar bracts not observed; pedicels 1–2 mm; buds purple, 2 mm. Flowers upturned, dark purple, few opening; perianth 3 mm, perigone lacking to 0.2 mm; stamens zygomorphic, stalked. Fruit rare, green, 6–7 mm diameter, mostly aborting. (*L. muscari*).

Phenology: July–August; September–October. *Origin*: Unknown. *Source*: Powell Gardens. *Accession*: 85–003, Lattier 103. *Observations*: Similar appearance to 'Variegata' and 'Silvery Sunproof', which are more popularly available. Foliage does not hold its variegation, fading to creme and turning green late in season and on older leaves next year. Flowers hidden in foliage, and not that showy with a shortened rachis, but distinctive with a fasciated trident to victory ''V'' sign when produced.

'Super Blue'. Fast spreading groundcover from clumps to forming a mass 36–50 cm tall and spread. Leaves erect, arching near base outward and recurved to ground, dark green, wide, and 25–46 cm long. Scapes conspicuous, to 30 cm overtopping laxed leaves; rachis nearly half peduncle length, semicrowded. Flowers lilac-blue to bluish-purple. Fruit abundant, dark blue to bluish-black berries.

Phenology: Summer; August–September. *Origin*: Developed by KPS Sales, Apoka, FL (State-By-State Gardening Newsletters, 2013). *Sources*: As *L. muscari*, Bennet's Creek Nursery, Inc. (2013), New Vision Nursery (2013), Three Volcanoes Farm (2013). *Notes*: Forest of Eastern Asia; leaves lax and fountain-like, large-flowered cultivar similar to 'Big Blue', but taller and more vigorous (Learn2Grow, 2013b). Dark blue berries in summer; fast grower; resistant to deer, crown disease and drought (Three Volcanoes Farm, 2013). *Observations*: Not examined in original study, but apparently available wholesale in the United States presently. Probably *L. exiliflora* based on the vigorous clumping spreader habit and heavy fruiting.

'Super Dwarf'. Dwarf tufted groundcover forming dense mounds of adjacent plants, 2.5–3 cm tall; rhizomes 1–2 mm with daughter plants adjacent to parent plants. Leaves erect, scarcely arching apically, dark

green, 3–4 mm long, 1–2 mm wide, veins 5–7. Inflorescences lacking. (*O. japonicus*).

Phenology: Unknown. *Source*: Plant Delights Nursery. *Accessions*: 01–261, 12–346. *Observations*: Dwarf form of the dwarf 'Bluebird', shorter with mounds hugging the ground. Outline of an individual plant lacks the appearance of a tree with a spreading canopy associated with 'Bluebird'.

SUPER GREEN GIANT ('Merton Jacobs'). Spreading groundcover forming dense clumps 45–50 cm in 3 years, to 60–75 cm tall at maturity, 45–75 cm wide. Leaves green to dark green, coriaceous, ascending to arching, 30–75 cm long, 9–16 mm wide. Scapes 35–45 cm, well above. Flowers erect, lavender-blue to violet-blue; perianth 6 mm, 3 mm wide. Fruit black. 4–4.5 mm diameter. (*L. gigantea*).

Phenology August–September. *Origin*: Randall Merton Jacobs selected an open-pollinated seedling of *L. gigantea*, at Flowerwood Nursery, Bushnell, FL. Introduced by Plant Development Services, Luxley, AL in 1999, and U.S. plant patent applied on 28 October. Patent no. 12068 issued 26 Aug. 2001 for 'Merton Jacobs'. *Notes*: Google patents (2013), Learn2Grow (2013b). Cited as unique for its vigorous growth, heat and drought tolerance, capacity for withstanding wind and salt spray, and violet flowers on long racemes; an improved form of 'Evergreen Giant'. *Observations*: Morphological data are very similar to the older cultivar 'Evergreen Giant' and difficult to segregate from it.

'Superba' State-By-State Gardening Groundcover forming loose clumps, 33–38 cm tall, daughter plants 2–7 cm from parent plant. Leaves erect, arching near middle outward with age, dark green, 24–38 (–53) cm long, 5–14 (–20) mm wide, veins 13–27, weakly ribbed above. Scapes among leaves, 20–42 cm; peduncle compressed-terete, green, (11–) 17–28 cm; rachis green to lavender, 6–17 cm, fascicles 30–40, semicrowded to open, internodes 2–8 mm, 1) occassionally fasciated, 2–3 terminal branches 1.5–4 cm long, or 2) rarely forming a cockscomb 7–9 mm wide apically, or 3) rarely with 1–2 basal lateral branches 1–2 cm long; bracts 2–3 mm, foliar bracts green, 10–33 mm; pedicels 2–3 mm; buds lavender, 2–3 mm. Flowers upturned, pinkish-lavender to dark lavender; perianth 3–4 mm, perigone 0.5–1.2 mm; stamens zygomorphic, stalked. Fruit abundant, green becoming black, 5–7 mm diameter. (*L. exiliflora*).

Phenology: July–August; August–October. *Origin*: Leo Ammons, Bosman, MD. *Sources:* Clarence Landis (from Ammons), JC Raulston Arboretum 02–0549. *Accession*: 87–081, 92–186. *Observations*: Leaves were eaten by rabbits.

'Supergreen Giant'. An invalid orthographic version of a trademarked name = **SUPER GREEN GIANT**.

'Supreme'. Leaves green, 29.5–33 cm long, 5–6 mm wide, veins 7–9. Scapes 25–29 cm; peduncle compressed-terete, 15.5–19 cm; rachis 9–10 mm; fascicles open; bracts 3–5 mm, foliar bracts not observed; pedicels 3 mm; buds 3 mm. Flowers erect; perianth 4 mm, perigone 1 mm; stamens zygomorphic, stalked. Fruit not observed.

Phenology: August. *Origin*: Doug Young Nursery? *Source*: Herbarium voucher, *Boussard s.n.*, 14 Aug. 2006 (from Doug Young Nursery, LA). *Observations*: Probably a selection of *L. exiliflora*. Cultivar name known only from the voucher supplied by Broussard.

'Tamaryu'. Dwarf creeping groundcover to 8–10 cm tall. Leaves dark green variegated, 4–5 cm long, 1–3 mm wide; variegation with white margins and vertical stripes. Scapes hidden among leaves; rachis arching outward, fascicles 4–6. Flowers nodding, pale purple. *(O. japonicus*).

Phenology: July–August. *Origin*: Japan. *Sources*: Listed in 1999 RHS Plant Finder (Hatch 2011b). *Observations*: Unable to obtain, thus not examined in study. No evidence found of it in United States.

'Tamaryu No. 2' ('Tama-ryu Number Two'). Creeping groundcover to 10–12 cm tall. Leaves dark green variegated, to 5 cm long, 1–3 mm wide; variegation with white margin and vertical stripes. Scapes hidden among foliage; rachis arching outward. Flowers nodding, pale pink. (*O. japonicus*). *Notes*: Cited as cold hardy, USDA Zones 7–10 °F (B & T World seeds, 2011).

'Tamaryu Nishiki' ('Tama Ryu Nishiki'). Dwarf creeping groundcover to 4–6 cm tall. Leaves erect-arching, dark green, 2.5–8 cm long, 1–2 mm wide, veins 3–7; variegation with white marginal band and white vertical stripes. Scapes hidden among leaves, 4.5 cm long; peduncle flat, green, 3 cm; rachis arching outward, green, 1.5 cm, fascicles 3; bracts green, 4 mm; pedicels white, 1.5–2 mm. Flowers nodding, white; perianth 4 mm, perigone 0.5–1 mm; stamens actinomorphic, subsessile. Fruit dark blue. (*O. japonicus*).

Phenology. June–July; July. *Origin*. Japan, obtained by James Waddick, KS City, MO, from a Japanese Nursery. *Sources*: JC Raulston Arboretum 90–0198 (from Waddick), Mountain Crop Improvement Laboratory no. 2010–111, as 'Tamaryu Nishiki', Plant Delights Nursery (from Barry Yinger, Asia, as 'Tama Ryu Nishiki'). *Accessions*: 90–135, 12–347. *Notes*: Tamaryu grass (dwarf snake's beard) is used in *karesansui* gardens to offset stones in the garden (Yoshikawa, 1996). *Observations*: The selection from Asia labeled as 'Tama Ryu Nishii' was received at Plant Delights Nursery (Nov. 2009), planted out in beds Mar. 2011. It was found neither in 2012 nor in 2013. The arboretum plant died quickly. Thus, data are limited, but enough for segregation.

'Tarafu'. Invalid name, an orthographic variation = **'Torafu'**.

'Tears of Gold'. Dwarf creeping groundcover forming clumps 10–30 cm tall. Leaves erect, weakly arching, golden yellow to yellow, 12–35 cm long, 1–2 mm wide, veins 3–5; variegation with green stripes to maturing all green. Scapes hidden among the leaves, 9–17 cm; peduncle flat, lavender to purplish, 7–12.5 cm; rachis arching outward, lavender, 2.5–5 cm, fascicles 6–10, open, internodes 1–12 mm; bracts lavender, 2–3 mm, foliar bracts not observed; pedicels 1–2 mm; buds 3 mm. Flowers nodding, white; perianth 3–4 mm, perigone 1–2.5 mm; stamens actinomorphic, subsessile. Fruit dark blue, 7–10 mm diameter. (*O. japonicus)*.

Phenology: June–July; July. *Origin*: Japan. *Sources*: Mountain Crop Improvement Laboratory 2010–064, Plant Delights Nursery (from JC Raulston Arboretum, Mar. 2005). *Accessions*: 01–262, 12–349. *Observations*: Distinctive dwarf plant with narrow golden leaves. A slow grower, struggling in garden, reproduction frequently vegetative, not sexual.

'Tedwell's Big Blue'. Invalid name, an orthographic variation = **'Tidwell's Big Blue'**.

'Tidwell's Big Blue' ('Tedwell's Big Blue'). Spreading groundcover forming loose cluster 25–35 cm tall for 2–3 years before spreading, daughter plants 1–4 cm from parent, then 11–16 cm with age. Leaves erect to weakly arching apically, green, weakly glaucous below, 20–42 cm long, 4–9 mm wide, veins 11–15. Scapes among foliage apex, (14–) 21–36 cm; peduncle green to dark green tinged purple, 17–25 cm; rachis lavender, 7.5–11 cm, fascicles 25–35, open, internodes 3–8 mm; bracts 2–4 mm, foliar bracts not observed; pedicels 2–3 mm, buds lavender to light purple, 2–3 mm. Flowers upturned, bluish-purple; perianth 3–4 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit abundant, green becoming black, 4–7 mm diameter. (*L. exiliflora*).

Phenology: July–August; August–September, persisting to July next year. *Origin*: Tidwell Nursery. *Source*: as *L. muscari*, Clarence Landis (from Tidwell Nursery), Tidwell Nursery. *Accession*: 86–019, 87–052. *Notes*: 'Big Blue' from Riegel Plant Company was a clumping groundcover with purplish flowers. Tidwell introduced his selection into the trade as a clumper. Then, the Big Blue controversy began: clumper or stoloniferous. Some nurseries began using additional words in the cultivar name ('Big Blue Riegel', 'Original Big Blue') or in the marketed description (e.g., authentic, genuine) to denote that they were marketing the clumping selection from Riegel. Fantz visited Tidwell Nursery in 1986 and purchased two pots of 'Tidwell Big Blue' for this study, and obtained plants from another source in 1987. *Observations*: Description based upon data obtained from these plants over a decade. They formed a small clump for 2–3 years in the research plots, then in the 1990s began spreading outward with daughter plants on longer underground rhizomes. Riegel's 'Big Blue' remained caespitose in the research plots for years, and is distinct from this selection. Nesom (2010) quoted Bo Tidwell who affirmed that his selection was a clumper, not a runner.

'Tidwell's True Blue'. Present selection now marketed from Tidwell Nursery as a clumper (Nesom, 2010).

'Tokai Rinpa' ('Tokai Wanami'). Weakly creeping groundcover forming clusters 20–30 cm tall × 32–40 cm diameter. Leaves erect, arching outward from middle to below middle, dark green variegated, 18–34 cm long, 4–12 mm wide, veins 17–25; variegation commonly yellow in basal area and apically with dark green or yellow blotches 2–9 cm deep, and dark green maculation in between. Scapes among foliage, 20–26.5 cm; peduncle compressed-terete, green, 16–19.5 cm; rachis 4.5–9.5 cm, fascicles 14–24, crowded, internodes 1–5 mm; bracts 2–3 mm, foliar bracts not observed; pedicels 2 mm; buds 2–3 mm. Flowers upturned, lavender; perianth 3–4 mm, perigone 0.5–2 mm; stamens zygomorphic, stalked. Fruit black, 4 mm diameter. (*L. exiliflora*).

Phenology: July–August; August. *Origin*: Japan. *Source*: As *L. muscari*, Plant Delights Nursery (from Hawksridge, Sept. 2006). *Accessions*: 12–328, Lattier 207. *Notes*: Received by Plant Delights as 'Tokai Wanami', but the name was changed to 'Tokai Rinpa' by 2012. Exciting introduction from Japan that makes a tight clump of dark black-green foliage with bright irregular horizontal bands of gold, topped with short spikes of lavender flowers in late summer; leaves darker green and brighter yellow than 'Sideswiped', and more of a weeping habit (Plant Delights Nursery, 2013b).

'Tokai Wanami'. Invalid name, a synonym of an older name. = **'Tokai Rinpa'**.

'Torafu' ('Tarafu'). Spreading groundcover to 8–15 cm tall, daughter plants 3–14 cm from parent, nonclumping. Leaves erect and arching outward, green variegated, (8–) 12–20 cm long, 2–4 mm wide, veins 3–7, glaucous between veins; variegated irregularly with transverse/horizontal bands of yellow, 0.3–12 mm deep, juvenile leaves often yellowish below the middle. Scapes among the leaves, 7–9 cm; peduncle purplish, laterally compressed with thin wing on each side, 5–6.5 cm long; rachis green tinged purplish, 1.5–2 cm, fascicles open, 2–4, internodes 8–9 mm long; bracts 2–4 mm, foliar bracts not observed; pedicels 2 mm, buds lavender to purple, 4 mm. Flowers upturned, light purple; perianth 4–5 mm, perigone pale whitish, 1–2 mm, stamens zygomorphic, stalked. Fruit greenish as juvenile, abort, mature fruit not observed. (*L. minor)*.

Phenology: Late June–early July; late July. *Origin*: Kairyo-en, Japan. *Sources*: *As O. japonicus*, Brookside Gardens (from Kairyo-en), JC Raulston Arboretum no. 94–0517 (from Brookside Gardens); as 'Tarafu' Plant Delights Nursery (from Brookside Gardens). *Accessions*: 91–165, 12–348, 12–368. *Notes*: Clone distributed as the species *O. japonicus*, probably because the vegetative growth form resembles dwarf selections of that species. *Observations*: Upturned flowers and zygomorphic stalked stamens indicate that 'Torafu' was a misidentified *Liriope.* A distinct, unique, spreading dwarf clone with green leaves bearing transverse bands of yellow. Zebra-striped liriope does not flower every year, but it is conspicuous when it does. Plants spread widely, thus grow in confined area for best visual effect.

'Trabert White'. Invalid name, an orthographic variation of the released name. = **'Traebert White'**.

'Traebert White' ('Gilner White', 'Trabert White'). Clumper, 25–40 cm tall, basal spread to 35 cm. Leaves erect, arching ca. 2/3 its length, green, weakly ribbed above, 30–49 (–61) cm long, 7–15 mm wide, veins 9–15 to -25 as minor veins raised with age. Scapes above leaves, (21–) 34–50 cm, peduncle green, becoming white near apex, 19–31 cm; rachis light green becoming white, 12–18 cm, fascicles 30–45, open, lower internodes 4–8 cm; bracts 3–4 mm, foliar bracts 6–8 mm; pedicels 3–4 mm, buds white, 2–3 mm. Flowers upturned, white; perianth 3–5 mm, perigone lacking; stamens zygomorphic, stalked. Fruit black, 3–6 mm diameter, aborting. (*L. muscari*).

Phenology: June–July; August–September. *Origin*: Found growing in a garden of the Harper Estate on West Paces Ferry Road in Buckland area of Atlanta, GA. *Notes*: The garden was planted originally by a local landscaper and included white-blooming *Liriope* 'Monroe White'. Mrs. Harper's daughter, Auverne Brady selected the clone and took it to her home in Atlanta where her husband Hal divided it and planted this selection in their garden. Auverne gave plants to Tracy Traer in 1980, who brought it to Raleigh for evaluation at the JC Raulston Arboretum. Raulston originally used the name 'Gilner White' for Tom Gilbert, but quickly changed it to 'Traebert White' to honor both Tracy Traer and Tom Gilbert. He released it under this name in 1983 (T. Traer, personal communication, June 1993). *Source*: JC Raulston Arboretum. *Accession*: 87–031. *Observations*: Probable sport of 'Monroe White' or seedling from outcross with another clone and 'Monroe White' as female parent. Tracy cited that it was selected for taller inflorescences than 'Monroe White'. Leaves burn in sun, but supurb in shade.

'Tuft Tuft Lavender'. Groundcover to 20–25 cm tall × 35–38 cm diameter. Leaves erect, arching outward, dark green, 23–27 cm long, 1–3 mm wide, veins 3–5. Scapes among leaves, 6–9.5 cm; peduncle 2.5–5 cm; rachis arching outward, 2.5–4.5 cm, fascicles 9–12, open; bracts 2 mm; pedicels 2–3 mm. Flowers nodding, 3–5/fascicle, mauvy-lavender; perianth 3–4 mm; perigone 1 mm. Fruit dark blue, 7–9 mm. (*O. japonicus*).

Phenology: June–July. *Origin*: China, collected by Darrell Probst as CPC 17.11.00. *Notes*: Named by Tony Avent, released by Plant Delights Nursery in 2014; part sun to shade; zone 6a-8b; photo in bloom (Plant Delights Nursery, 2014c). *Source*: Plant Delights Nursery. *Accession*: 15–375. *Observations*: Vouched January 2015.

'Tuft Tuft Silver'. Dwarf groundcover 10–20 cm tall × 38 cm wide. Leaves erect, arching to ground, medium dark green to dark green, 30–39 cm long, 1–3 mm wide, veins 3–5. Scapes 6–9.5 cm; peduncles 2.5–5 cm; rachis arched outward, 3–4 cm. Fascicles 9–11, open; bracts 2 mm; pedicels 3 mm. Flowers nodding, 3–5/fascicle, silvery-white; perianth 4–5 mm; perigone 3–4 mm. Fruit dark blue, ellipsoidal-globular, 9–10 mm. (*O. japonicus*).

Phenology: early June; September–January. *Origin*: Sichuan, China, collected by Darrell Probst as CPC 19.11.00. *Notes*: Named by Tony Avent; released by Plant Delights Nursery in 2014; part sun to shade; zone 6a-8b; photo in bloom (Plant Delights Nursery, 2014d). *Source*: Plant Delights Nursery. *Accession*: 15–376. *Observations*: Vouched January 2015.

'Twisted Variegated'. Clumper 20–30 cm tall. Leaves erect, green variegated, twisted slightly near base, 25–41 cm long, 6–8 mm wide, veins 11–13: variegation with yellow marginal band. Scapes among leaves, 16–26 cm, peduncles flat, 11–17.5 cm, rachis 7–10 cm, fascicles open, lower internodes 9–11 mm; bracts 4–6 mm, foliar bracts 9–11 mm; pedicels 2–4 mm. Flowers white, nodding, perianth 4 mm, perigone 1.2–2 mm; filaments actinomorphic, subsessile. Fruit not observed. (*O. intermedius*).

Phenology: June. *Origin*: Carolina Nursery? *Source*: As *Liriope*, Mountain Crop Improvement Laboratory 2010–036 (from Carolina Nursery when it closed). *Accession*: Lattier 106. *Observations*: Similar to 'Argenteomarginatus' and 'Grandiflora Variegata', but distinct with the twisting leaves and longer peduncles.

'Ursula's Blue Fruit' ('Ursula's Favorite'). Groundcover forming large clumps, 45–60 cm tall × 30–50 cm diameter. Leaves erect, dark green, semi-stiff, 28–50 cm tall, 7–13 mm wide, veins 17–21. Scapes 27–56 cm; peduncles green, 21–43.5 cm; rachis light green to nearly white, arching slightly outward at 30° from vertical, 4–12 cm, fascicles 3–5, open; bracts 3–7 mm, foliar bracts 7–90 mm; pedicels light green, 4–10 mm; buds white 4–5 mm. Flowers white, nodding; perianth 5–6 mm, perigone 3–5 mm. Fruit blue. (*O. jaburan*).

Phenology: July–August; September–October. *Origin*: Ursula Herz, Coastal Gardens and Nursery, Myrtle Beach, SC. *Source*: Plant Delights Nursery (from Jim Waddick). *Accession*: 12–356. *Notes*: Plant Delights Nursery database noted that 'Ursula's Favorite' ended up somehow on tag in 2005. *Observations*: Showy specimen plant with green foliage and elongated scapes with drooping white flowers followed by blue fruits.

'Ursula's Favorite'. Invalid name derived from a labeling error = **'Ursula's Blue Fruit'**.

'Variegata'. A cultivar name applied to five species, derived from a descriptive term for the variegated foliage. Four are treated as invalid names; the fifth treated as a valid cultivar.

1) **'Variegata'**. Caespitose groundcover 15–30 cm tall, 8–20 cm spread. Leaves erect, arching outward gradually near middle, green variegated, 22–37 cm long, (6–) 10–17 mm wide, veins 15–25; variegation with

yellowish marginal bands 1–5 mm wide, quickly fading to creme or creamy-whitish with age, and occasionally some vertical creamy stripes 1–3 mm wide. Scapes among the foliage, (14–) 21–38 cm; peduncle green becoming purplish, (12–) 23–30 cm; rachis lavender to light purple, 7–16 cm, fascicles 30–45, lowermost internodes 6–8 mm; bracts 1–3 mm, foliar bracts 6–10 mm; pedicels whitish, 4–6 mm; buds purplish. Flowers upturned, purple to dark purple; perianth 3–4 mm, perigone to 0.5 mm; stamens zygomorphic, stalked. Fruit rare, green becoming black, 3 mm, mostly aborting. (*L. muscari*).

Phenology: June to Sept; September–October. *Origin*: Unknown. *Sources*: Carroll Gardens. Evergreen Nursery, LA Nursery. *Accessions*: 85–012, 87–071, 89–121. *Observations*: Leaves typically are green and creme in this selection, not as striking visually as other variegated plants. Reports of creeping to invasive for 'Variegata' are probably not this clone. Confused with 'Sunproof' and 'Silvery Sunproof', both that can bear some cockscombs, lavender-purple to bluish-purple flowers, and a perigone to 1 mm. Also, any unnamed variegated clone of *Liriope* is marketed often descriptively as "*Liriope* Variegata (-e, -ed)," adding to the confusion and sometimes interpreted as a cultivar 'Variegata'.

2) 'Variegata'. Invalid name associated with *L. gigantea* 'Variegata'. *Source*: Plant Delights Nursery (from Greenlee/Gary Hammer), named changed July 2012 to *O. intermedius* 'Variegata' = **'Variegated Evergreen Giant'**.

3) 'Variegata'. Invalid name associated with *O. intermedius* 'Variegata'. *Sources*: Louisiana Nursery, Plant Delights Nursery= **'Variegated Evergreen Giant'**.

4) 'Variegata'. *Origin*: Paul Simon, Gärtnerischer Pfanzenbau, from Korea. *Source*: As *O. jaburan* 'Variegata', JC Raulson Arboretum 88–0089 (from Korea via Paul Simon); as *O. jaburan* variegated, Plant Delights Nursery. *Accessions*: 88–097, 12–357. An invalid synonym name= **'Aureovariegatus'**.

5) 'Variegata'. *Sources*: As *O. japonicus* 'Variegata', JC Raulston Arboretum; as *O. japonicus* var. *gracuilis* 'Variegata', Plant Delights Nursery (from Nature's Curiosity Shop). Invalid name, associated with *O. japonicus* as an orthographic variation = **'Variegatus'**.

'Variegata Alba'. *Origin*. In 1992, Lanny Thomas (Swift Creek Nursery, Clayton, NC), noted a "mutation" bearing white flowers among *L. muscari* 'Variegata' obtained from Southern States Nurseries. *Source*: As *L. muscari* 'Variegata Alba' from Lanny Thomas. *Notes*: Thomas added the term *alba* (Latin for white) to distinguished it from purple-flowered 'Variegata. *Accession*: 92–176. Treated as an invalid name as morphology similar to an older cultivar selection, thus a synonym of the older name = **'Variegated White'**.

'Variegated Evergreen Giant' (some marketed as 'Aztec'). Weak spreader forming large clustered groundcover 45–60 cm tall, daughter plants 1–7 cm from parent plant. Leaves erect, lax arching at middle and above, green variegated, (15–) 35–50 cm long, (4–) 7–11 mm wide, veins 9–25; variegation with yellow to creme to white marginal band 0.5 mm wide and vertical stripes 0.5–2 mm wide. Scapes among leaves toward outer clump perimeters, 17–37 cm; peduncle laterally compressed, green, 7–17 cm; rachis green becoming whitish, (10–) 17–21 cm, fascicles 35–55, open, lower internodes 10–18 mm; bracts 2–3 mm, foliar bracts 5–8 mm; pedicels whitish with green striations, 3–5 mm; buds 3 mm. Flowers nodding, white, 6 mm diameter; perianth 4–4.5 mm, perigone 1.5–3 mm. Stamens actinomorphic, subsessile. Fruit aborted. (*O. intermedius*).

Phenology: June–August. *Origin*: Unknown. *Source*: As *L. muscari*, Horticultural Products, Inc., Windmill Farms. *Accession:* 90–138, 96–249. *Notes*: Vernacular name is Aztec grass; thus sometimes cited as 'Aztec'. Fantz (2009) corrected the species designation and reported its confusion with variegated selections of *O. jaburan*. *Observations*: Not winter hardy in Raleigh area. Flowered in greenhouse from June–October, fruits not produced. Commonly used in the lower southern landscapes as a tall broad clumper bearing white nodding flowers and variegated leaves.

'Variegated White' ('Variegated Alba'). Caespitose groundcover 30–42 cm tall. Leaves arching about 17–23 cm from base, light green to green variegated, 20–42 cm long, 6–9 mm wide, veins 13–17; variegation sparse with yellowish band 3–5 mm wide, maturing to green with whitish marginal band 1–2 mm wide and sparse, white stripes. Scapes among leaves, 24–35 cm; peduncle green to whitish apically, (14–) 21–26.5 cm; rachis green, 6.5–12 cm, fascicles 25–35, crowded, lower internodes 2–4 mm; bracts 2–3 mm, foliar bracts not observed; pedicels 3 mm; buds white. Flowers upturned, white; perianth 3–4 mm, perigone to 0.5 mm; stamens zygomorphic, stalked. Fruit 2 mm diam, aborting. (*L. muscari*).

Phenology: June–August. *Origin*: Unknown. *Source*: Evergreen Nursery, Clarence Landis (from Malloy Nurseries), Swift Creek Nursery (from Southern States Nurseries). *Accession*: 87–072B, 88–088, 92–176. *Observations*: Similar to 'C.T. Tanner' and 'White on White', both smaller plants with a conspicuous perigone.

'Variegatus' (*O. japonicus*). Dwarf creeping groundcover 10–13 cm tall. Leaves erect, arching above the middle, green variegated, (8–) 15–23 cm long, 1–2 mm wide, veins 3–5; variegation with yellow to creme to white marginal bands and stripes. Scapes hidden among foliage, 6–9 cm; peduncle flat, 4–6 cm; rachis arching outward, 1.5–2.5 cm, fascicles 4–6, loose; bracts 2–3 mm, foliar bracts 6–8 mm; pedicels 2 mm; buds 2 mm. Flowers nodding, whitish tinged pale pinkish; perianth 3 mm, perigone 1 mm; stamens actinomorphic, subsessile. Fruit 6–7 mm, mostly aborted. (*O. japonicus*).

Phenology: July; September–October. *Origin*: Unknown. *Sources*: Clarence Landis, Taylor's Nursery, Plant Delights Nursery. *Accessions*: 91–170, 91–173, 12–350. *Observations*: Similar to 'Fuiri Gyoku Ryu' and 'Nana'. Some plants under this name are misidentified *O. intermedius*, and belong to 'Argenteomarginalis'.

'Variegatus' (*O. intermedius*). Leaves 33–42 cm long, 4–7 mm wide, veins 9–11. Scapes 19–20 cm; peduncle 9–10 cm; rachis 9–10.5 cm, open, internodes 7–17, fascicles 25–28; bracts 4–7 mm, foliar bracts 9; pedicels 4 mm; buds white, 3 mm. Flowers white, nodding; perianth 3 mm, perigone 2 mm. (*O. intermedius*).

Phenology: June. *Origin*: Unknown. *Source*: As *O. japonicus* 'Variegatus', Mountain Crop Improvement Laboratory 2010–053 (from Carolina Nurseries), Plant Delights Nursery (from MCIL). *Accession*: 2010–053. *Observations*: Misidentified to species, data in agreement with older cultivar name = **'Argenteomarginalis'**.

'Vittatus'. *Source*s: Mountain Crop Improvement Laboratory no. 2010–045, Plant Delights Nursery (from Duncan and Cotsworld). *Accessions*: 02–281, 12–333. *Notes*: Invalid name, marketed under shorter version of older name. = **'Argenteovittatus'**.

'Webber'. Caespitose groundcover 20–30 cm tall. Leaves erect, arching outward near middle or below, green variegated, 27–40 cm long, 8–12 mm wide, veins 11–19; variegation with yellow to creme marginal band 0.5–1 mm wide. Scapes among leaves, 21–30 cm; peduncle green becoming purplish, 17–22 mm; rachis 4–8 cm; fascicles 25–35, crowded, internodes 3–5 mm; bracts 3–4 mm, foliar bracts 6–7 mm; pedicels 3–4 mm; buds 2–3 mm, purple. Flowers upturned, purple; perianth 4 mm, perigone lacking to 0.5 mm; stamens zygomorphic, stalked. Fruits typically abort. (*L. muscari*).

Phenology: July–August. *Origin*: Taylor Nursery. *Source*: Taylor Nursery. *Accession*: 91–169. *Observations*: Poorly known of the small variegated plants with marginal bands.

'Webster'. Invalid name, a shorthanded labeling version. = **'Webster Wideleaf'**.

'Webster Wideleaf' ('Webster'). Caespitose groundcover (16–) 20–35 cm tall, (15–) 40–57 cm diameter spread. Leaves erect, stiffly-pliable, arching outward, dark green, (15–) 25–56 cm long, (8–) 14–26 mm wide, veins 15–31, some ribbed above. Scapes hidden among leaves, 22–38 cm; peduncle compressed angular-terete, green becoming purplish apically, 15–18 mm; rachis purple to whitish above, (7–) 12–23 cm, fascicles 18–34, semi-open to crowded apically, internodes 3–7 mm long, occasionally 1) fasciated of few branched apically, branches 1–2 cm long, or rarely 2) a basal branch to 2 cm, or very rarely 3) with few additional ascending rachises 2–5 cm long; bracts 2–4 mm, foliar bracts 6–11; pedicels lavender, 2–4 mm, buds lavender to purple, 4 mm. Flowers upturned, bluish-purple to dark purple, opening to 9 mm diameter, 3–6 per fascicle; perianth 4–5 mm, thin whitish margin on lobes,

perigone to 0.5 mm; stamens zygomorphic, stalked. Fruit green becoming black, 6–8 mm diameter. (*L. platyphylla*).

Phenology: Late June–August, late August–October, persisting to May. *Origin*: Unknown (Adams, 1980). *Sources*: as *L. muscari*, Carroll Gardens, Evergreen Nursery, LA Nursery, JC Raulston Arboretum (from Classic Groundcovers). *Accessions*: 87–044, 87–073, 88–112, 90–145. *Observations*: Regarded as similar to 'Evergreen Giant' in form, but not as tall, used as a good border plant or under trees. A liriopogon with broad leaves with some ridge-like veins above.

'White on White'. Weak creeping groundcover 20–30 cm tall. Leaves erect arching, green variegated, 19–32 cm long, 6–9 mm wide; variegation with yellow to creme to whitish marginal bands 1–2 mm wide. Scapes among leaves; peduncle green; rachis green becoming whitish. Flowers upturned, white; perigone to 1 mm. (*L. exiliflora*).

Phenology: July–August. *Origin*: Carroll Gardens. *Source*: As *L. muscari*, Carroll Gardens. *Accession*: 90–146. *Observations*: Weak growth, struggled in plots. Name may be descriptive.

'Wonder Evergreen'. Creeping groundcover forming a loose clump 26–30 cm tall, daughter plants 3–7 cm away from parent. Leaves erect, green, weakly glaucous below, 24–47 cm long, 6–11 mm wide, veins 11–19. Scapes hidden among foliage, 19–37 cm; peduncle green, 17–30 cm; rachis green becoming lavender, 6–11.5 cm, fascicles 27–40, loose, internodes 4–8 mm; bracts 2–4 mm, foliar bracts 8–31 mm; pedicels 2–4 mm; buds 3 mm, pinkish becoming lavender. Flowers upturned, bluish-lavender; perianth 3–4 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit abundant, green becoming black, 5–7 mm diameter. (*L. exiliflora*).

Phenology: July–August; July–October, persisting to next June. *Origin*: Unknown. *Sources*: As *L. muscari*, Alex Summers, Carroll Gardens, Clarence Landis (from Sommers). *Accession*: 86–020, 87–034, 87–087. *Observations*: Heavy fruiter once established. Clone grows as a clumping groundcover for several years, but becomes invasive by the 6th–7th year.

'Wuhan Variegated'. Groundcover forming clumps 30–40 cm tall. Leaves erect arching, green variegated, 30–53 cm long, 8–12 mm wide, veins 19–29; variegation with a yellow to creme marginal band 1–3 mm wide and stripes. Scapes 45–47; peduncle flat, 33–35 cm; rachis 10–11 cm, fascicles 25–33; bracts 12–17, foliar bracts 21–31 mm long; pedicels 6 mm. Flowers nodding, white, perianth 7–8 mm, perigone 4 mm. (*O. jaburan*).

Phenology: June. *Origin*: Unknown. *Source*: Mountain Crop Improvement Laboratory no. 2010–044 (from Carolina Nurseries). *Accession*: Lassiter 213. *Observations*: Similar to 'Argenteovittatus'.

'Xmas', 'Xmas Tree'. Invalid names used for shorter labeling practice. = '**Christmas Tree**'.

'YAM001'. An invalid name, trial name used for cultivar = **'Emerald Cascade'**.

YAPARD ('Black Beard'). Clump-forming groundcover slowly spreading, 60 cm tall × 60 cm spread in 3 years. Leaves erect, then arch outward and down and curl when mature, dark gray-green to grey-purple, to 40 cm long, 7–8 mm wide. Scapes to 35 cm; peduncles flat, narrowly winged, to 20 cm; rachis to 7 cm, fascicles several; bracts to 11 mm (=foliar bract length); pedicels 2 mm; buds 7 mm. Flowers fragrant, campanulate; perianth 5–6 mm, perigone 4 mm; stamens subsessile. Fruit globose, 6–8 mm diameter. (*O. planiscapus*).

Phenology: Southern United Kingdom, July–August; fall. *Origin*: A cross made in 2002 by Steve Yandall, Rainbow's End Nursery, Penzance, Cornwall, United Kingdom, between unnamed seedlings. Asexual reproduction accomplished in Summer 2005 by in vitro propagation, Stoneyford Co. Kilkenny, Repubic of Ireland. *Notes*: San Marcos Growers (2013a) cited 'Black Beard' ('Yapard') PP22,128. U.S. Plant Patent no. 22128 was filed 13 Dec. 2009 and granted 6 Sep. 2011. Patent description cited Yapard as distinguished from other selections of *Ophiopogon* by its grayish foliage color, abundance of flowers, and exhibiting a vigorous growth habit; flowers are similar to typical black mondo grass (*O. planiscapus* 'Nigrescens') with whitish lilac color, but are on a longer (up to 14 inch) flower spike, followed by dark, nearly black berries in fall (Justia Plant Database 2013). *Source*: PP 22128 (Justia Plant Database, 2013b). *Observations*: YAPARD is the legal name for patent 22128. However, 'Black Beard' plants observed in this study were differed by a smaller habit, a smaller rachis, smaller flowers, and leaves more purplish-black, nongreyish. Thus, it was segregated in our key. 'Black Beard' presented herein may represent younger plants that were studied, increasing in size over several years of growth, or represent a misidentified clone.

Unnamed Clones under Evaluation

The following clones are distinctive, but lack a true cultivar name. The name in parenthesis following the clone number is an invalid descriptive name for clone identification, not a cultivar name. Alphabetized by descriptive name.

Clone no. 1. (ABG Form). Groundcover forming loose clumps 40–65 cm tall × 36 cm diameter. Leaves erect-arching outward, dark green, 40–66 cm long, 10–22 mm wide, veins 15–53, weakly ribbed above, midrib impressed. Scapes very conspicuous, well overtopping foliage, 50–127 cm; peduncle 20–86 cm; rachis 27–41 cm, rarely with lateral basal ascending branch, 1.5–9 cm long; fascicles 70–90, loose, internodes 2–6 mm, lowermost 18–30 mm; bracts 4–5 mm; pedicel 2–3 mm; buds bluish-purple, 2–3 mm. Flowers upturned, lavender to bluish-purple, 5–7 per fascicle; perianth 3–4.5 mm, perigone 1.5–2 mm; stamens zygomorphic, stalked. Fruit not observed. *(L. platyphylla*).

Phenology: July–August. *Origin*: Ozzie Johnson on trip to Atlantic Botanical Garden. *Source*: Plant Delights Nursery (from Ozzie Johnston, April 2007). *Accession*: 13–369. *Observations*: Unique selection, flowers a lighter hue than others of species, a clumper with dark green foliage beneath giant inflorescences of numerous bluish-purple buds and flowers. Very showy in flowering state with its giant inflorescences.

Clone no. 2 (Chumley Variegated). Leaves erect, variegated, 14–20 cm long, 4–6 mm wide, veins 7–9, emerge yellow, fading to yellow with green medial stripes, then to deep green.

Phenology: Late July. *Origin*: Robert Chumley, who did not know its source. *Source*: As *Ophiopogon* Chumley Variegated, Plant Delights Nursery (from Robert Chumley in July 2008). *Notes*: Bloom occurred in late July and identification was changed to *Liriope*; planted in garden in Apr. 2009. *Accession*: 14–376. *Observations*: Plant struggling, marginally cold hardy, few leaves were present with inflorescences lacking.

Clone no. 3 (Dwarf Lilyturf). Weakly creeping groundcover forming a mounded clump 40–60 cm tall. Leaves green, 43–64 cm long, 1–2 mm wide, veins 3–5. Scapes among foliage, 14.5–17 cm; peduncle flat, 10.5–13 cm; rachis erect, 4–4.5 mm, fascicles 9–15, loose; bracts 3–4 mm, foliar bracts 6–20 mm; pedicels 1–3 mm. Flowers nodding; perianth 3 mm, perigone 3 mm. Fruit bluish, 5–6 mm diameter. (*Ophiopogon* sp.)

Phenology: Not observed; November. *Origin*: Unknown. *Source*: As *O. japonicus* dwarf lilyturf, U.S. National Arboretum Herb Garden. *Accession*: 93–240. *Observation*: Misidentified clone, definitely not *O. japonicus*, nor a dwarf. A distinct unnamed clone, possibly *O. bodnieri* (?).

Clone no. 4 (Early Bloomer). Weak creeping groundcover forming loose clumps 30–36 cm tall. Leaves erect, green, 32–61 cm long, 3–6 mm wide, veins 5–11. Scapes conspicuous, overtopping leaves, 33–56 cm long; peduncle green tinged purple, 28–44 cm; rachis green to creamy-lavender, 6.5–14 cm, fascicles 25–50, loose, internodes 2–13 mm; bracts 2–3 mm; pedicels 2 mm; buds lavender, 2–3 mm. Flowers upturned, lavender; perianth 3–4 mm, perigone 0.5–1 mm; stamens zygomorphic, stalked. Fruit not observed. (*Liriope* sp.).

Phenology: May–June. *Origin*: China, collected by Darrell Probst as *Liriope* sp. *nov*. CPC. 5.5.01.3. *Sources*: Mountain Crop Improvement Laboratory (from Plant Delights Nursery), Plant Delights Nursery (from Darrell Probst, Mar. 2002). *Accession*: 12–305. *Observations*: Early Bloomer was a temporary name assigned by Jason Lattier, descriptive for a unique trait, a *Liriope* blooming before any other clone in the genus.

Clone no. 5 (Garden Delights). Clumper to 40–50 cm tall. Leaves falcate, green, 40–44 cm long, 12–17 mm wide, veins 23–27. Scapes conspicuous, gigantic, well overtopping leaves, 70–81 cm; peduncle 46–56 cm; rachis pale green, 20–35 cm, sometimes 1) forking slightly above the peduncle into two branches 17–20 cm, 2) sometimes forming

a small, narrow cockscomb apically, 6 mm wide basally to 13 mm wide at apex, 3) sometimes fasciated with apical branches 2–6 cm long, or 4) rarely with 2–4 slender ascending rachises to 5.5 cm long; fascicles 85–120, lower internodes 6–20 mm; bracts 2–3 mm, foliar bracts not observed; pedicels green, 2–3 mm, buds. Flowers lavender; perianth 4 mm, perigone lacking, filaments zygomorphic, stalked. Fruit not observed. (*L. platyphylla*).

Phenology: July–August. *Origin*: Plants Delight Nursery. *Source*: Plant Delights Nursery. *Accession*: 12–371. *Observations*: A name temporary assigned by Paul Fantz for a clone under evaluation. Giant inflorescences well above the foliage with multiple variation in the rachis, makes this clone an outstanding liriopogon cultivar for delightful flowering aspects in the garden.

Clone no. 6 (Gold Leaf). Groundcover forming tight clumps to 20–25 cm tall. Leaves erect, arching above middle, chartreuse, becoming medium green with age, 17–25 cm long, 1–2 mm wide, veins 3–5. Scapes 11–13.5 cm; peduncle flat, light green, 8.5–12 cm; rachis arching slightly, 25–30° from vertical, 2.5–3.5 cm, fascicles 7–8; bracts 2–3 mm, foliar bracts not observed; pedicels 2–3 mm, buds 3 mm. Flowers nodding, pinkish; perianth 3 mm, perigone 2 mm; stamens actinomorphic, subsessile. Fruit not observed. (*O. japonicus*).

Phenology: June. *Origin*: Japan. *Source*: As *O. japonicus* gold leaf, Plant Delights Nursery. *Accession*: 13–361. *Observations*: A groundcover, listed by the descriptive term gold leaf, with narrow, greenish-yellow leaves similar to 'Spring Gold' and 'Tears of Gold'.

Clone no. 7. (Yellow Splash). Creeping groundcover forming clumps 25–37 cm tall, 36–54 cm spread, daughter plants 2–6 cm from parent. Leaves erect, arching above middle, dark green variegated, 30–39 cm long, 6–9 mm wide, veins 17–21; variegation irregularly borne in upper quarter of leaf, yellow with some green-maculate within. Scapes 20–22 cm; peduncle 17–19 cm; rachis 3–5 cm, fascicles 17–19, crowded; bracts 2–4 mm, foliar bracts 5–7 mm; pedicels 1.5–2 mm; buds 2 mm. Flowers upturned, bluish-purple; perianth 3 mm, perigone 0.5–0.7 mm; stamens zygomorphic, stalked. Fruit not observed. (*L. exiliflora*).

Phenology: July–August. *Origin*: Unknown. *Source*: as *L. muscari* (yellow splash), JC Raulston Arboretum. *Accession*: 13–365, Lattier 202. *Observations*: Yellow splash is a descriptive name, but the only name currently available. This clone is distinctive with the upper quarter of each leaf yellow with irregular shape and some green maculation.

Conclusion

Nearly 230 names are covered in this treatment that included 140 cultivar names plus 12 additional legalized names and seven unique clones as yet unnamed. Each has quantitative descriptions, sources, and additional data presented. Also, included were

Table 4. List of cultivars by the assigned species herein.

Liriope	
Liriope exiliflora	
Alba	Regal
AMETHYST	Rocket
Blue Spire	Samantha
C.T. Tanner	Silver Banded
CASSIDY	Sno Cone
Green Midget	Snow Dragon
ISABELLA	Summer Beauty
Jeanerette	Superba
Lilac Wonder	Tidwell's Big Blue'
LIRF	Tokai Rinpa
LIRTP	Wonder Evergreen
Majestic	White on White
Majestic Variegata	
Liriope gigantea	
EMERALD GODDESS	LIRJ
Evergreen Giant	Love Portion No. 13
Hartledge Giant	Merton Jacobs
JUST RIGHT	SUPER GREEN GIANT
Liriope graminifolia	
Maireri	Porcupine
Mop Top	
Liriope longipedicillata	
Grape Fizz	
Liriope minor	
Torafu	
Liriope muscari	
Big Blue	Moneymaker
Big Um	Monroe's White
Blue Cushion	Moore's White
Blue Giant	New Wonder
Border Gem	Okina
Cheju	Paul Aden
Christmas Tree	Peedee Ingot
CLEOPATRA	Purple Bouquet
Curly Twisted	Purple Passion
EMERALD CASCADE	Royal Purple
EXC-052	Sheffield
Gold Banded	Sideswiped
Grandiflora	Silver Banded
Hawk's Feather	Sunproof
John Burch	Super Blue
Liliac Beauty	Traebert White
MARC ANTHONY	Variegata
Majestic	Variegated White
Marant	Webber
Liriope platyphylla	
Densiflora	Webster Wideleaf
Liriope spicata	
Ariaka-janshige	Miniature
Franklin Mint	New Orleans
Haku Ryu	Quail Garden
Ingwersen	Silver Dragon
Majestic	
Liriope sp. (Not assigned herein to a species)	
Curly Tops	Supreme
Ophiopogon	
Ophiopogon bodinieri	
Pygmaeus	
Ophiopogon intermedius	
Argenteomarginatus	Silver Shower
Crested White	Twisted Variegata
Grandiflora White	Variegated Evergreen Giant
Mexican Giant	
Opiopogon jaburan	
Argenteovittatus	CRYSTAL FALLS
Aureovariegatus	Wuhan Variegated
Crow's White	
Ophiopogon japonicus	
Bluebird	Ryu No Higa
Comet	Sapphire Snow
Compactus	Shiroshima Ryu
Curly Lady	Silver Vein
Fuiri Gyoku Ryu	Spotted Tiger

(*Continued on next page*)

Table 4. (*Continued*) List of cultivars by the assigned species herein.

Ophiopogon	
Gyoku Ryu	Super Dwarf
Gyoku Ryu Dwarf	Tamaryu
Intermedius	Tamaryu Nishiki
Kigimafukiduma	Tears of Gold
Minor	'Tuft Tuft Lavender
Nana	Tuft Tuft Silver
Nana Variegata	Variegatus
Nippon	
Ophiopogon japonicus var. *caespitosus*	
Aritaki Gracilis	
Ophiopogon planiscapus	
Arabicus	Hosoba Kokuryu
Aztec Prince	Juru
Black Beard	Koku Ryu
Ebknizam	Nigra
EBONY KNIGHT	Nigrescens
Edge of Knight	YAPARDt
Haku Ryu Ko	
Ophiopogon sp. (Not assigned herein to species)	
Baby Leopard	Silver Ribbon
BALI STRIPE	Spring Gold
NEW BLUE	Sparkler
Platypus	Tamaryu No. 2
Shiro Tama Hime	
Invalid names	
Unnamed Clone (Reference name for this paper only)	
ABG form	Garden Delights
Chumley Variegated	Gold Leaf
Dwarf lilyturf	Yellow Splash
Early Bloomer	
Confused Taxa	
Albus	Fuku-ho-ryu
Aztec	Giant
Big Green	Gigantea
Caeruleus	Gold Edge
California Hybrid	Korean Giant
Chinese Whisper	Minimus
Cockscomb	Tidwell's True Blue
Exiliflora	
Descriptive	
Original Big Blue	Rocket Giant
Labeling Shorthands	
PDI	Xmas
Webster	Xmas Tree
Orthographic Variations	
1103	Monroei
Ebzninan	Monroe's 1
Edge of Night	Nanus
Hoku Ryu Ko	Pamela Harper
Kigimafurhidoma	Silver Midget
Kigimagurkidoma	Silver Sunproof
Kigimasfukiduma	Supergreen Giant
Kigimatfuduma	Tama Ryu Nishiki
Kijimafukiduma	Tarafu
Kioto	Trabert White
Komo Ryu	Tedwell's Big Blue
Monroe no. 1	
Synonyms of older names	
Albus	Monroe no. 1
Dwarf	Niger
Gilner White	Pam Harper
Gin Ryu	Pee Dee Gold Ingot
Grandiflora Variegata	Pee Dee Ingot
Hakuryu	Tokai Wanami
Kyoto Dwarf	Ursula's Favorite
Korean Giant	Variegata
Kyoto Super Dwarf	Variegata Alba
Little Tabby	Variegatus
Maireri	Vittatus

nearly 70 invalid names herein that are synonyms, orthographic variants, descriptive names, or confused taxa. Nearly a third was misidentified to species. Forty percent of the cultivars designated as *L. muscari* in the trade belong to *L. exiliflora*. Table 4 provides a list of valid names assigned to species herein and invalid names.

This inventory is incomplete, as newer named selections have increased greatly in the past decade. Morphological characters used in this inventory treatment and measured ranges were sufficient to segregate cultivars currently. Thus, the inventory data and the key presented in Table 2 will be useful to assist one in identification and segregation of liriopogon selections, and serve as a base standard for naming of new clones. Cultivar names based upon descriptive names (e.g., aztec grass, dwarf plants) and morphological traits common to several species (e.g., leaf variegation, floral color) should be avoided in naming new selections as they lead to confusion among clones in the market. The cultivar name should be enclosed in single quotes with each word capitalized in marketing literature, clearly designating the cultivar name from the clonal marketing description.

Plant patent descriptions frequently are more qualitative, often using "averages" for morphological features. Thus, it is difficult to identify plants unless one grows them over several years. In addition, patented selections published often were compared with selections of a different species, thus easily noted as distinct and unique, a criteria for obtaining a patent.

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