

released in 1972 by the ARS, USDA, and the S.C. Agric. Exp. Stn. for use as source material in white clover (*T. repens* L.) breeding programs. Sources of the parent species and evidence for hybrids were reported by Gibson et al.<sup>3</sup>

SC-2 is the only hybrid obtained from many pollinations of *T. uniflorum* × *T. occidentale* (4x). SC-3 was selected from several plants obtained by backcrossing SC-2 to *T. uniflorum*. SC-2 has light green foliage, is intermediate to the two parent species in most characteristics, and is self-compatible. SC-3 has dark green foliage, is more resistant to Sooty Blotch [*Cymadothea trifolii* (Fn.) Wolf] and is self-compatible. The frequency of obtaining viable hybrid seed from crosses of *T. repens* × SC-2 and SC-3 has been higher than from crosses of *T. repens* × *T. uniflorum*. Thus, SC-2 and SC-3 facilitate the combining of germplasm of these species. Potentially, SC-2 and SC-3 may contribute to the development of white clover cultivars with shorter internodes, deeper and woodier roots, larger seed, and more drought tolerance.

Plants of SC-2 and SC-3 will be maintained through December 1975 by the Agron. Dep., S.C. Agric. Exp. Stn., Clemson, SC 29631.

<sup>3</sup> Pryce B. Gibson, Chi-Chang Chen, J. T. Gillingham, and O. W. Barnett 1971. Interspecific hybridization of *Trifolium uniflorum* L. Crop Sci. 11:895-899.

## REGISTRATION OF MINN A WHITE CLOVER GERMPLASM<sup>1</sup>

(Reg No. GP 6)

A. W. Hovin and H. L. Thomas<sup>2</sup>

MINN A white clover (*Trifolium repens* L.) was developed by the Minn. Agric. Exp. Stn. and was officially released as germplasm to plant breeders in November 1974.

Minn A is a composite of seed from crosses made between seven plants derived from 'Pilgrim' and 10 plants that trace to naturalized white clover collections made in Minnesota.

In 1949 a spaced-plant nursery of 768 Pilgrim plants was established at Rosemount, Minn. The plants in the nursery showed winter injury in the Spring of 1951; 33 of the most vigorous plants were selected. Five of these were reselected following severe winter injury in 1952 and were intercrossed. Seven plants selected among the progeny in 1953 were used as parents in crosses made in 1954 to 10 wild white clover plants. These 10 plants were selected for vigor and persistence among 840 plants from 58 seed collections made in Minnesota and observed at Rosemount in 1953-54.

F<sub>1</sub> plants from these crosses were examined in the field for growth habit, vigor, and winter survival, and selections were made for large plant size of the ladino type. Thirty-two such F<sub>1</sub> plants were intercrossed by hand and 6,116 F<sub>2</sub> plants were established in 1957 in a spaced-plant nursery. Of the 828 plants which survived the winter of 1958-59, the 39 most vigorous plants were re-established in an isolated, polycross seed increase nursery. All but one plant were less vigorous than the ladino type and had smaller trifoliolate leaves and petioles. The advanced seed increase of these 39 plants was designated Minn A.

In one comparative Minnesota trial with the ladino-type cultivars; Pilgrim, 'Merit,' and 'Nordic' and with common ladino clover, Minn A has shown improved winter survival (67 vs. 8% for the ladino type), but has been lower yielding in total seasonal production (4.7 vs. 5.4 metric ton/ha dry wt). In years when good stands of the ladino type have been maintained, Minn A has been intermediate in yield between the ladino and common white clover types. From these and other observations, Minn A appears to possess genes that may be useful in breeding programs aimed at improving winter survival of white clover cultivars in areas with less severe winter climate than Minnesota.

Seed of Minn A white clover will be maintained by the Minn. Agric. Exp. Stn. until the present supply is exhausted. Seed can be obtained in germplasm amounts from the Dept. of Agron. and Plant Gen., Univ. of Minn., St. Paul, MN 55108.

<sup>1</sup> Registered by the Crop Sci. Soc. of Am. Published with the approval of the director, Minn. Agric. Exp. Stn. as paper no. 8,948. Received Apr. 14, 1975.

<sup>2</sup> Professor and associate professor (retired), Dep. of Agron. and Plant Genet., Univ. of Minn., St. Paul, MN 55108.

## REGISTRATION OF ARIZONA 6X-3, ARIZONA 6X-13, AND ARIZONA 6X-50 COTTON GERMPLASM<sup>1</sup>

(Reg. Nos. GP 21 to GP 23)

H. Muramoto<sup>2</sup>

ARIZONA 6X-3, ARIZONA 6X-13, and ARIZONA 6X-50, three breeding stocks of hexaploid cotton, *Gossypium* spp. 2n = 6x = 78), were developed by the Ariz. Agric. Exp. Stn. and officially released Aug. 21, 1974.

These cottons originated from selections in populations of hexaploid cotton. (2n = 4x = 52) × *Gossypium sturtianum* Willis (2n = 2x = 26) and doubling the chromosome number chemically in the sterile F<sub>1</sub> hybrid (3n = 3x = 39), as illustrated in the following diagram:

$$\begin{array}{rcc}
 G. \text{ hirsutum} & \times & G. \text{ sturtianum} \\
 2(AD_1) & & 2(C_1) \\
 2n = 4x = 52 & & 2n = 2x = 26 \\
 & F_1 & \\
 & (AD_1)(C_1) & \\
 & 3n = 3x = 39 & \\
 & \text{Colchicine} & \\
 & 2[(AD_1)(C_1)] & \\
 & 2n = 6x = 78 &
 \end{array}$$

Arizona 6X-3 (Reg. No. GP 21) was selected from crosses made between Arizona Acala 44-10-1 × *G. sturtianum*.

Arizona 6X-13 (Reg. No. GP 22) was selected from crosses made between Hopicala × *G. sturtianum*.

Arizona 6X-50 (Reg. No. GP 23) was selected from crosses made between Arizona Experimental Superokra #1 × *G. sturtianum*.

All plants were selected from open pollinated populations with no selfing attempted. No yield data are available.

These hexaploid plants are glabrous with bluish green leaves ranging from normal in Arizona 6X-3 and Arizona 6X-13 to deeply lobed in Arizona 6X-50. All have strong stalks with short internodes. The flowers are considerably larger than those of either *G. hirsutum* or *G. barbadense*, and the petals are brilliant reddish-mauve with or without petal spots at the base. Anther sacs are cream, yellow, or red.

All plants possess good cold tolerance, and are somewhat tolerant to the leaf perforators (*Buccatrix thurberiella* Busck). They also have high tolerance to Lygus (*Lygus* spp.), in the seedling stage. The hexaploids have a diffused root system with weak tap roots, and extensive lateral roots that enables them to survive Phymatotrichum root rot infections (*Phymatotrichum omnivorum*).

The seed of the hexaploids are small, and the fibers short, but extremely strong. Data on lint quality, spinning performances, and additional information on plant characteristics are given in the References (1, 2, 3, 4, 5).

Small amounts of seed are available upon written requests to the Dep. of Agron. and Plant Genet., Ariz. Agric. Exp. Stn., Univ. of Ariz., Tucson, AZ 85721.

<sup>1</sup> Registered by the Crop Sci. Soc. of Am. Approved for publication by director, Ariz. Agric. Exp. Stn., journal paper no. 2,374, Univ. of Ariz., Tucson, AZ 85721. Received Apr. 4, 1975.

<sup>2</sup> Associate plant geneticist, Agron. and Plant Genet. Dep., Univ. of Ariz.

## REFERENCES

- da Silva, F. P. 1971. Cytogenetic study of chromosome behavior and inheritance of petal spot in the hexaploid *G. hirsutum* L. × *G. sturtianum* Willis. M.S. thesis, Univ. of Ariz. Library, Tucson, AZ 85721.
- Muramoto, H. 1969. Hexaploid cotton: Some plant and fiber properties. Crop Sci. 9:27-29.
- . 1969. A look at hexaploid cotton. 1969 Beltwide Cotton Prod. Res. Conf. (New Orleans, La, p. 80-81).
- . 1973. Hexaploid cotton: Some fiber and spinning properties. Crop Sci. 13:396-397.
- , J. D. Hesketh, and D. N. Baker. 1971. Cold tolerance in a hexaploid cotton. Crop Sci. 11:589-590.