



US012389846B2

(12) **United States Patent**  
**Vanoli et al.**(10) **Patent No.:** US 12,389,846 B2  
(45) **Date of Patent:** \*Aug. 19, 2025(54) **LETTUCE VARIETY 'PS 1525'**(71) Applicant: **Pinnacle Seed, Inc.**, Carmel, CA (US)(72) Inventors: **Mike Vanoli**, Carmel, CA (US);  
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( \*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 333 days.

This patent is subject to a terminal disclaimer.

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**Related U.S. Application Data**

(60) Provisional application No. 63/178,895, filed on Apr. 23, 2021.

(51) **Int. Cl.****A01H 6/14** (2018.01)  
**A01H 5/12** (2018.01)(52) **U.S. Cl.**CPC ..... **A01H 6/1472** (2018.05); **A01H 5/12** (2013.01)(58) **Field of Classification Search**

None

See application file for complete search history.

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*Primary Examiner* — Shubo Zhou*Assistant Examiner* — David R Byrnes(74) *Attorney, Agent, or Firm* — Morrison & Foerster LLP(57) **ABSTRACT**

New lettuce variety designated 'PS 1525' is described. 'PS 1525' exhibits stability and uniformity.

**15 Claims, 70 Drawing Sheets**  
**(70 of 70 Drawing Sheet(s) Filed in Color)**

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**FIG. 1A**



**FIG. 1B**



**FIG. 1C**



**FIG. 1D**



**FIG. 1E**

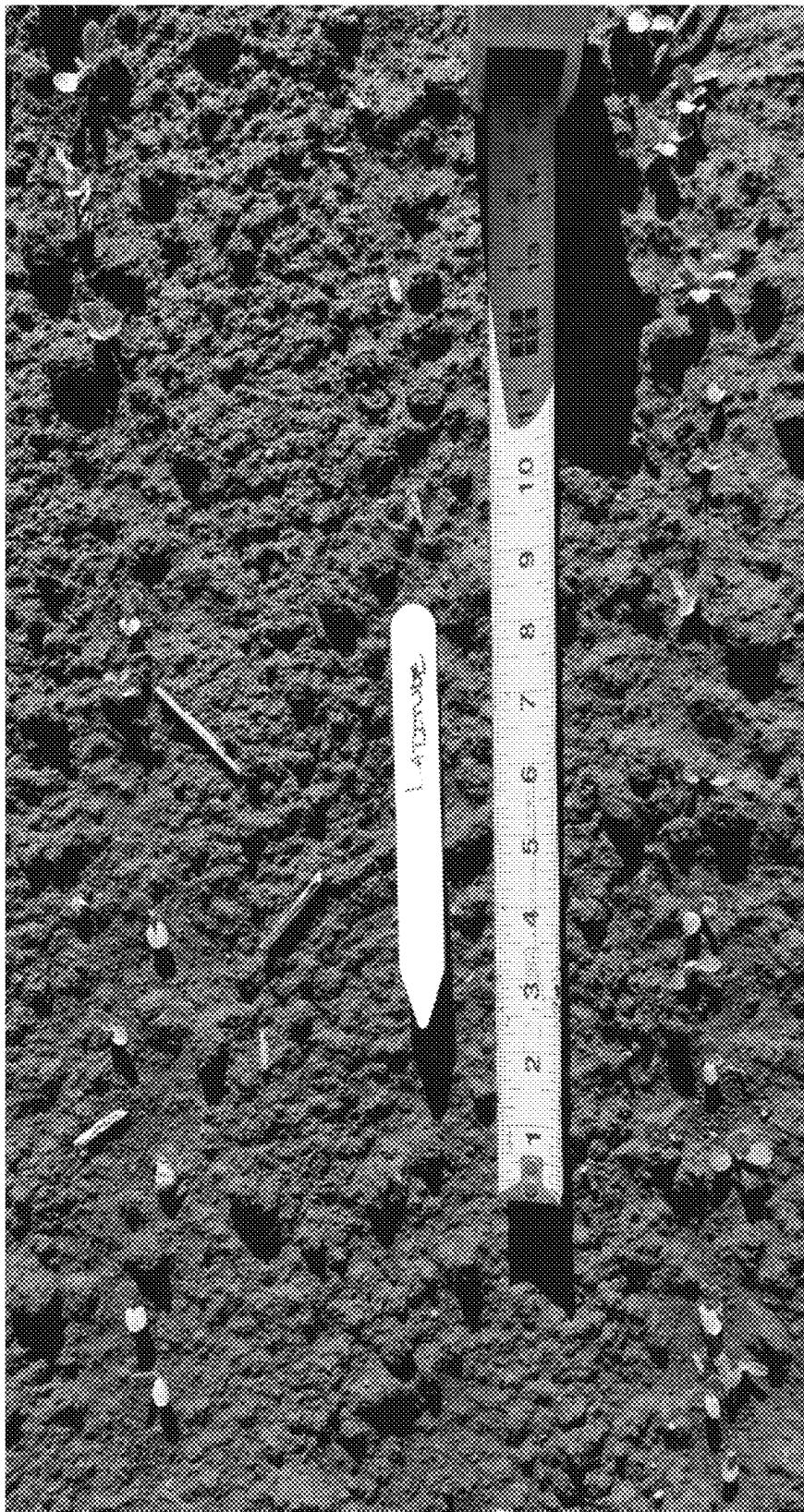
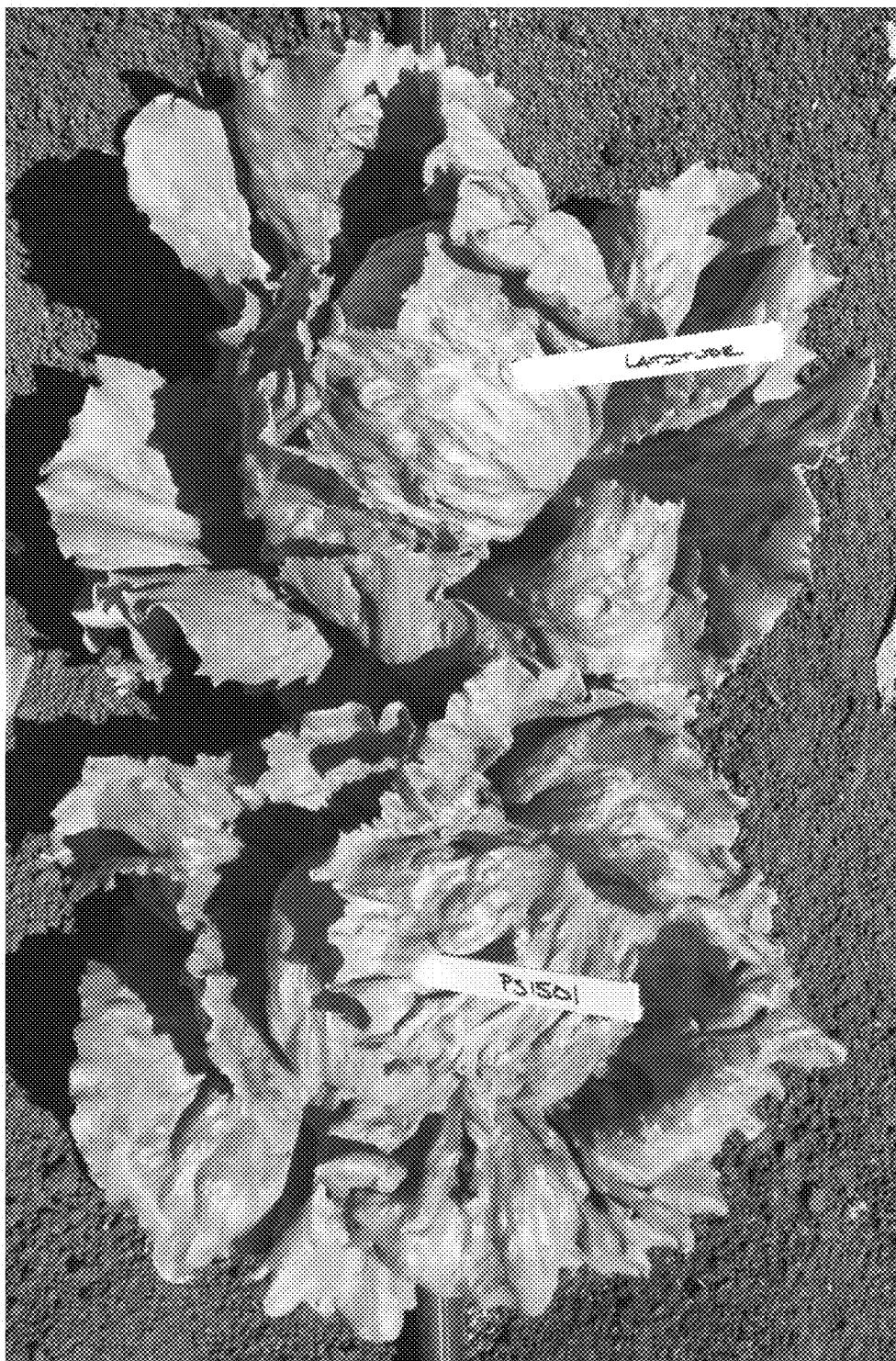


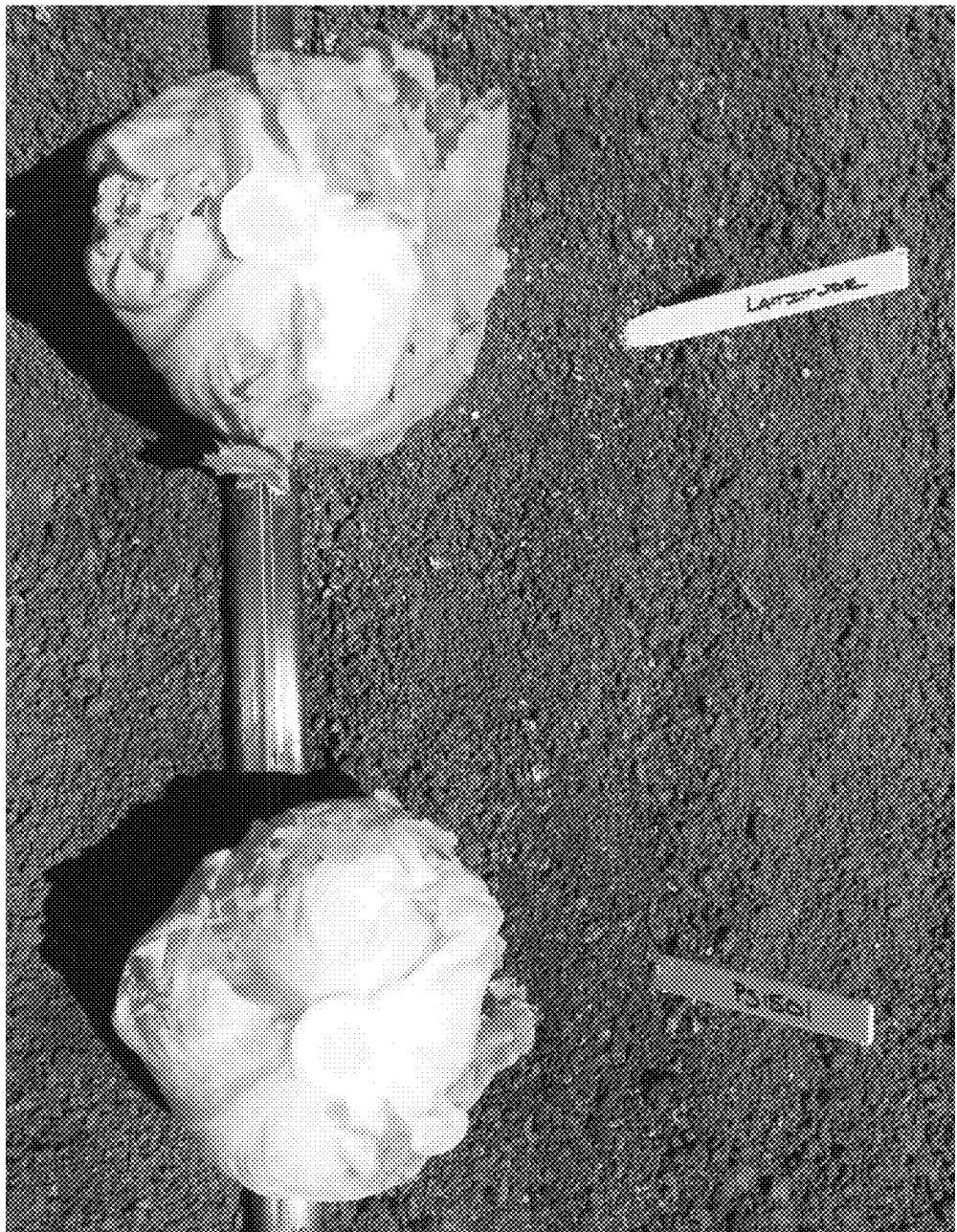
FIG. 1F



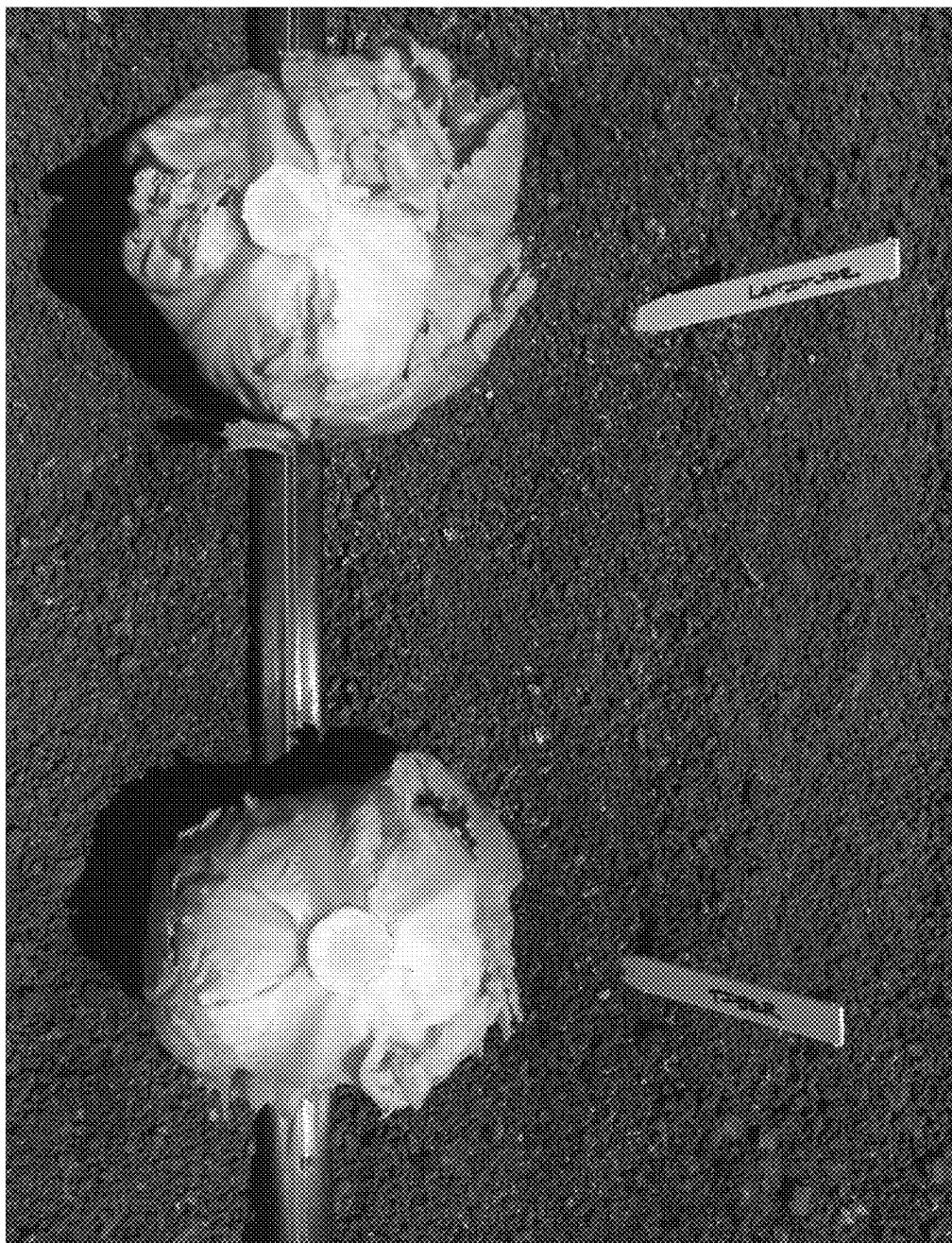
**FIG. 2A**



**FIG. 2B**



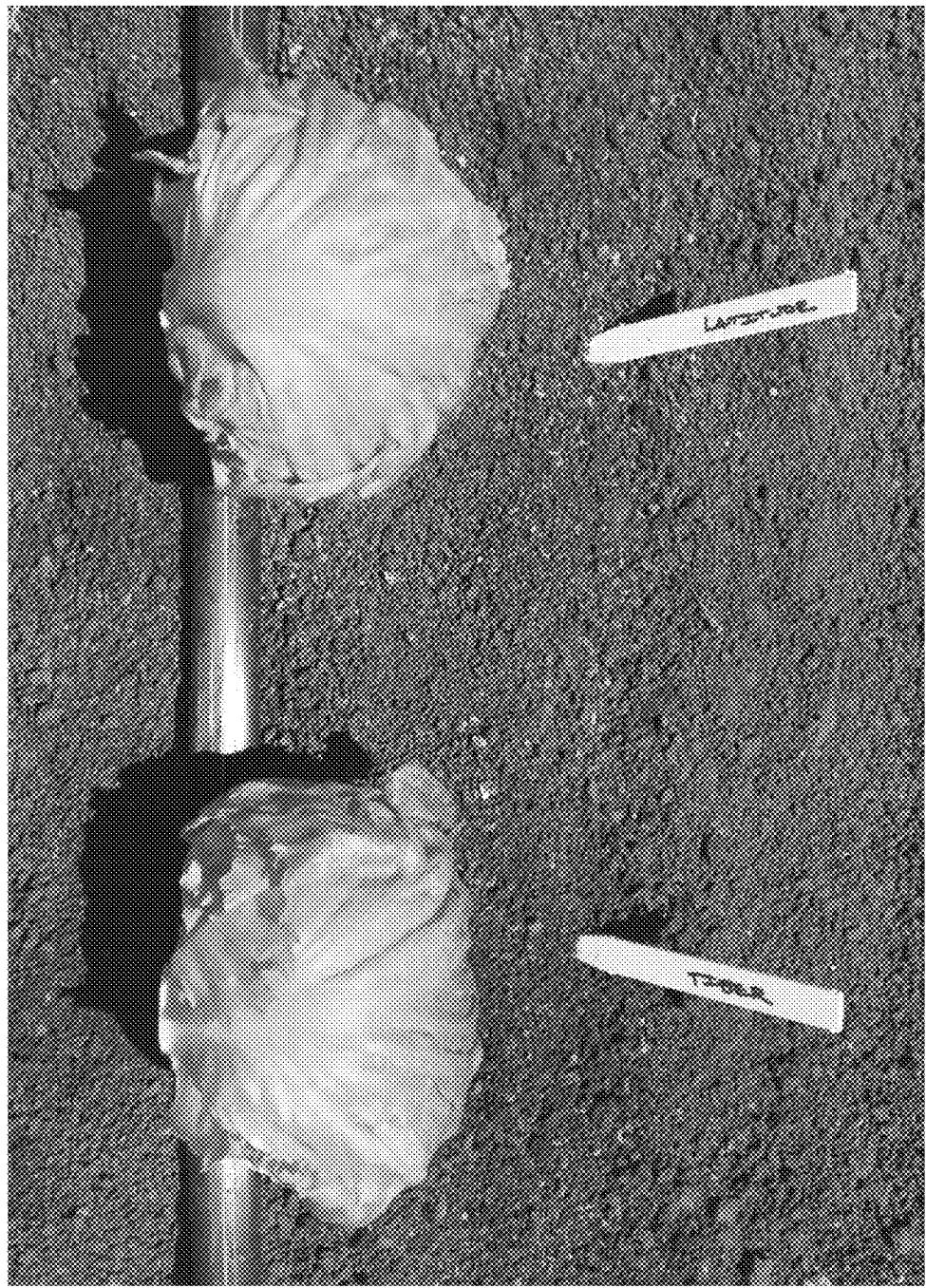
**FIG. 2C**



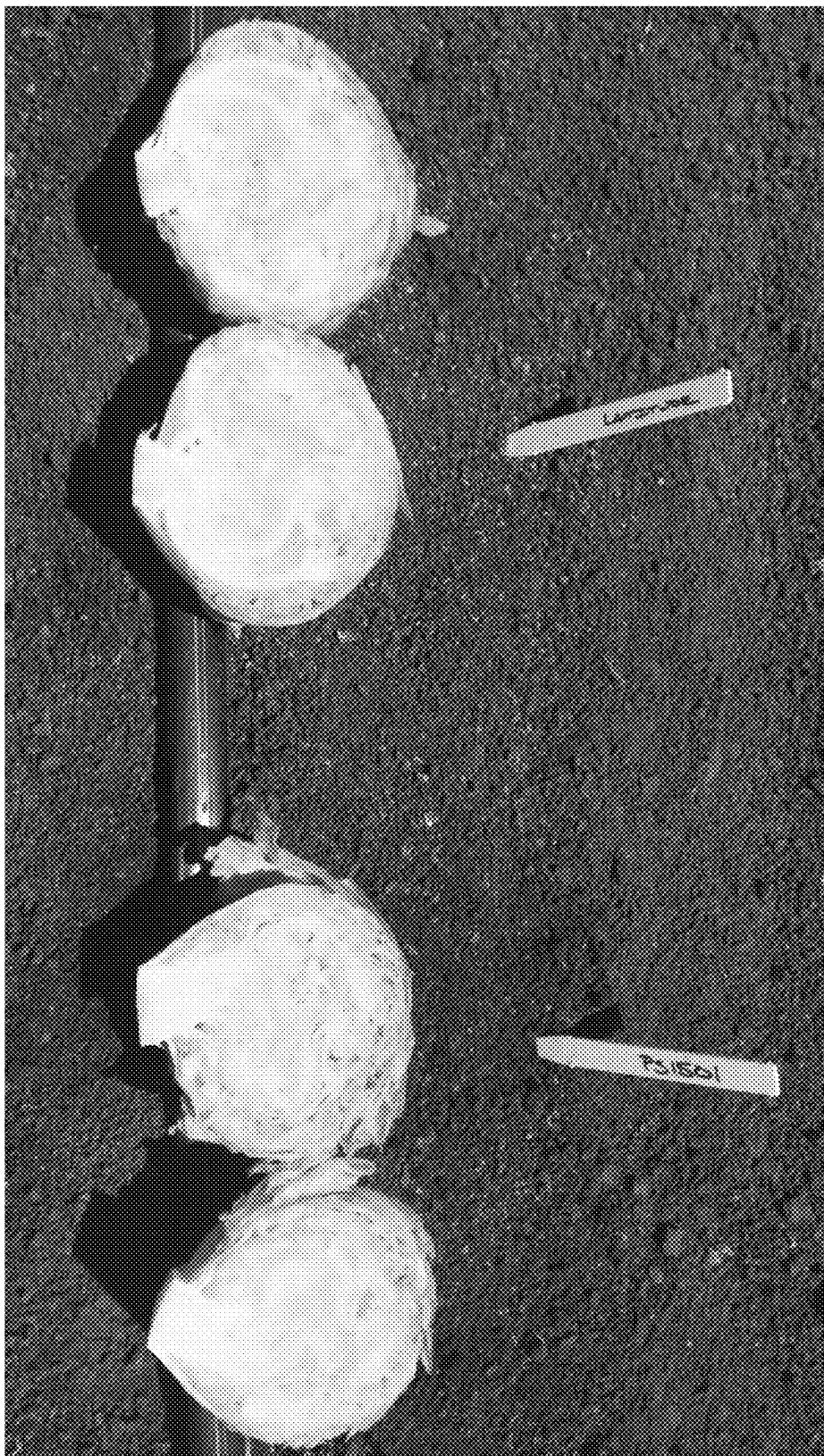
**FIG. 2D**



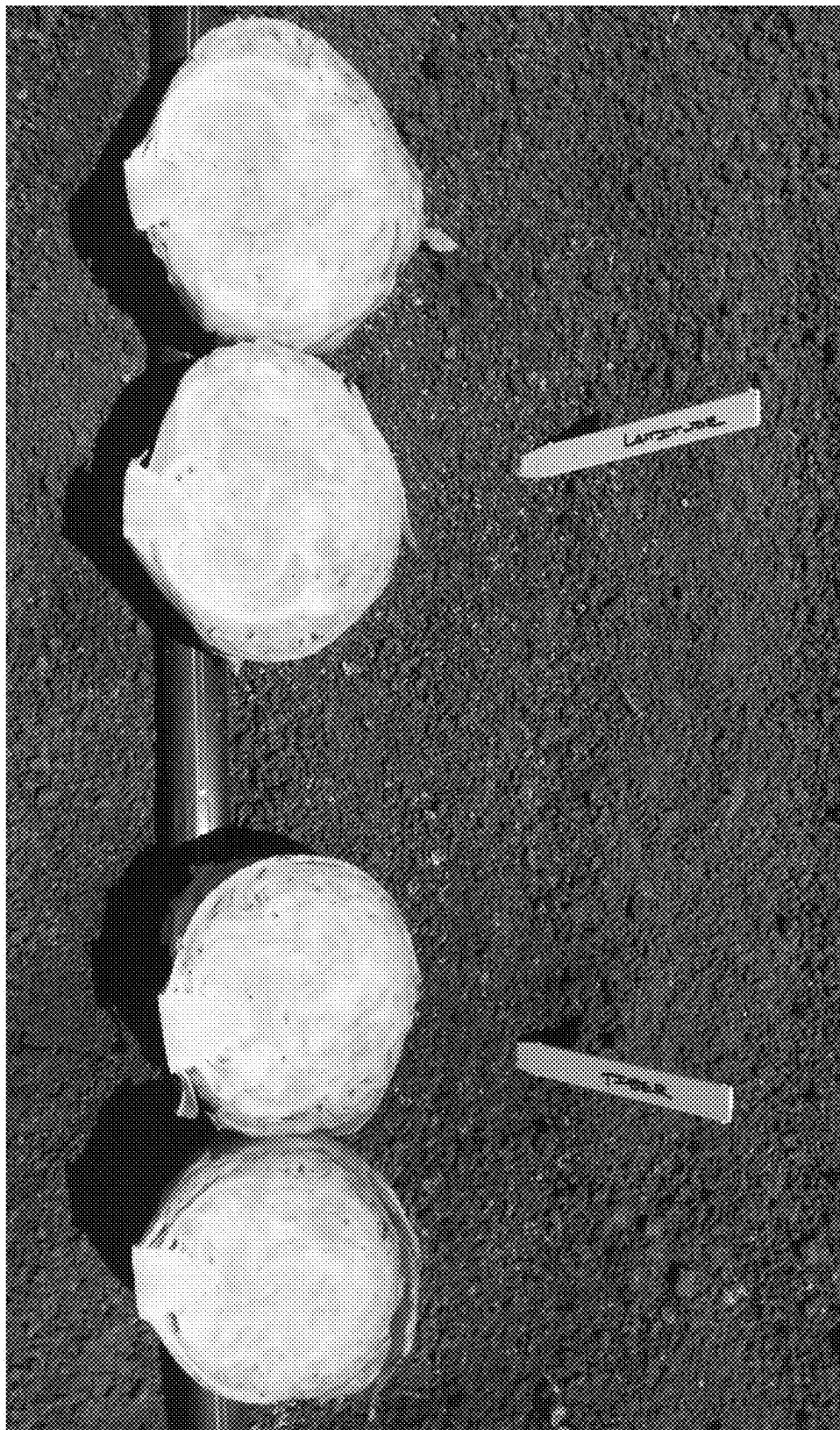
**FIG. 2E**



**FIG. 2F**



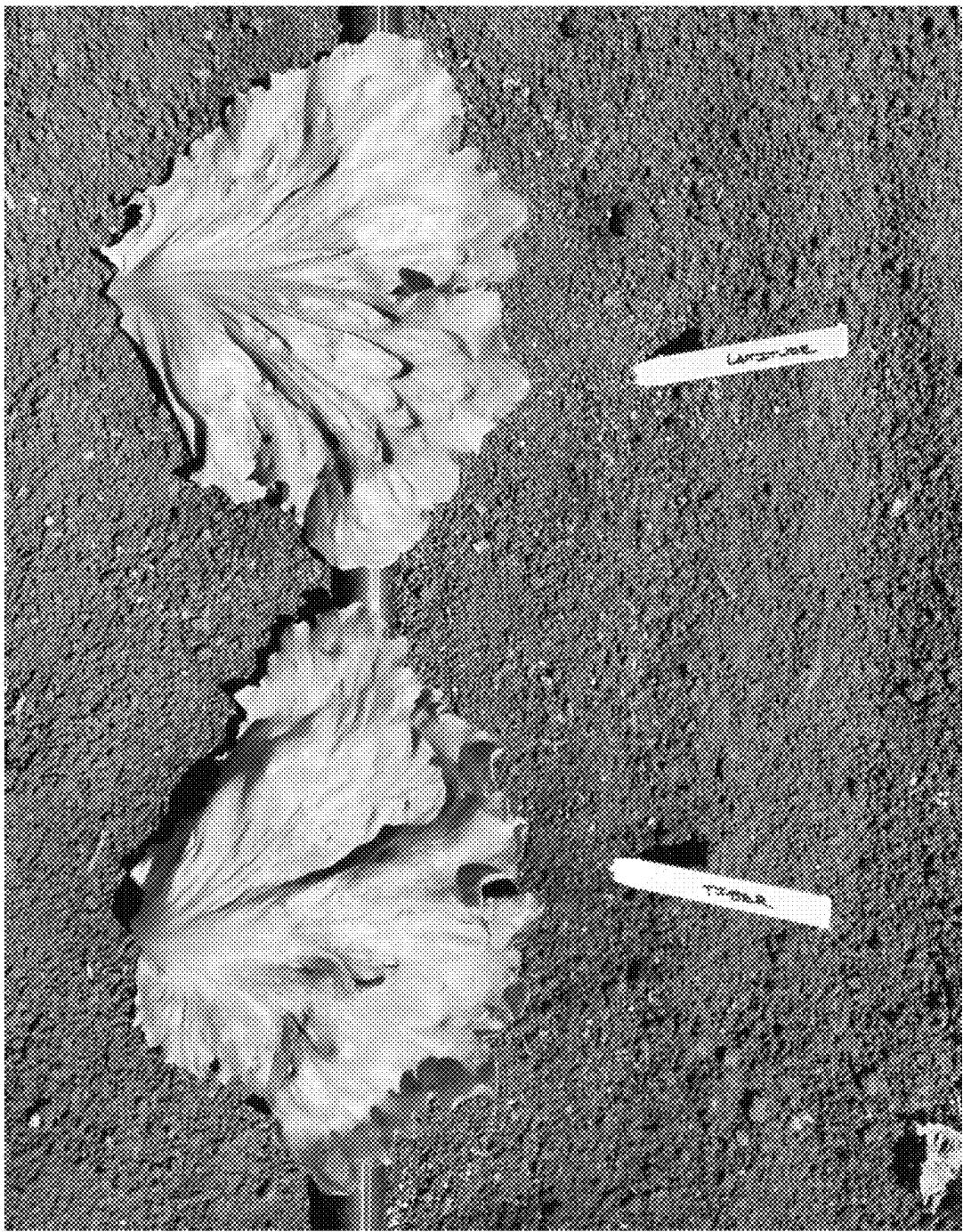
**FIG. 2G**



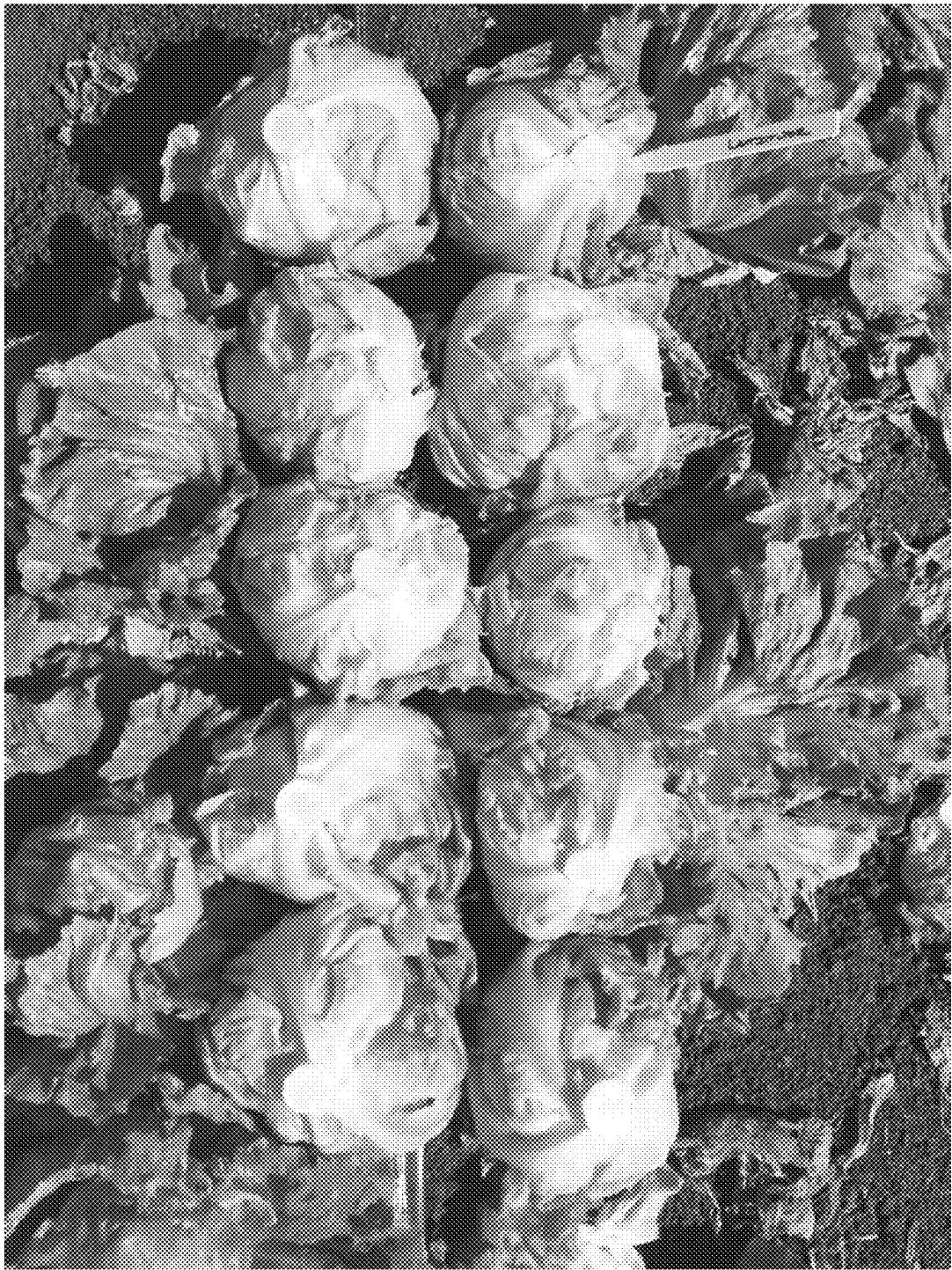
**FIG. 2H**



**FIG. 2I**



**FIG. 2J**



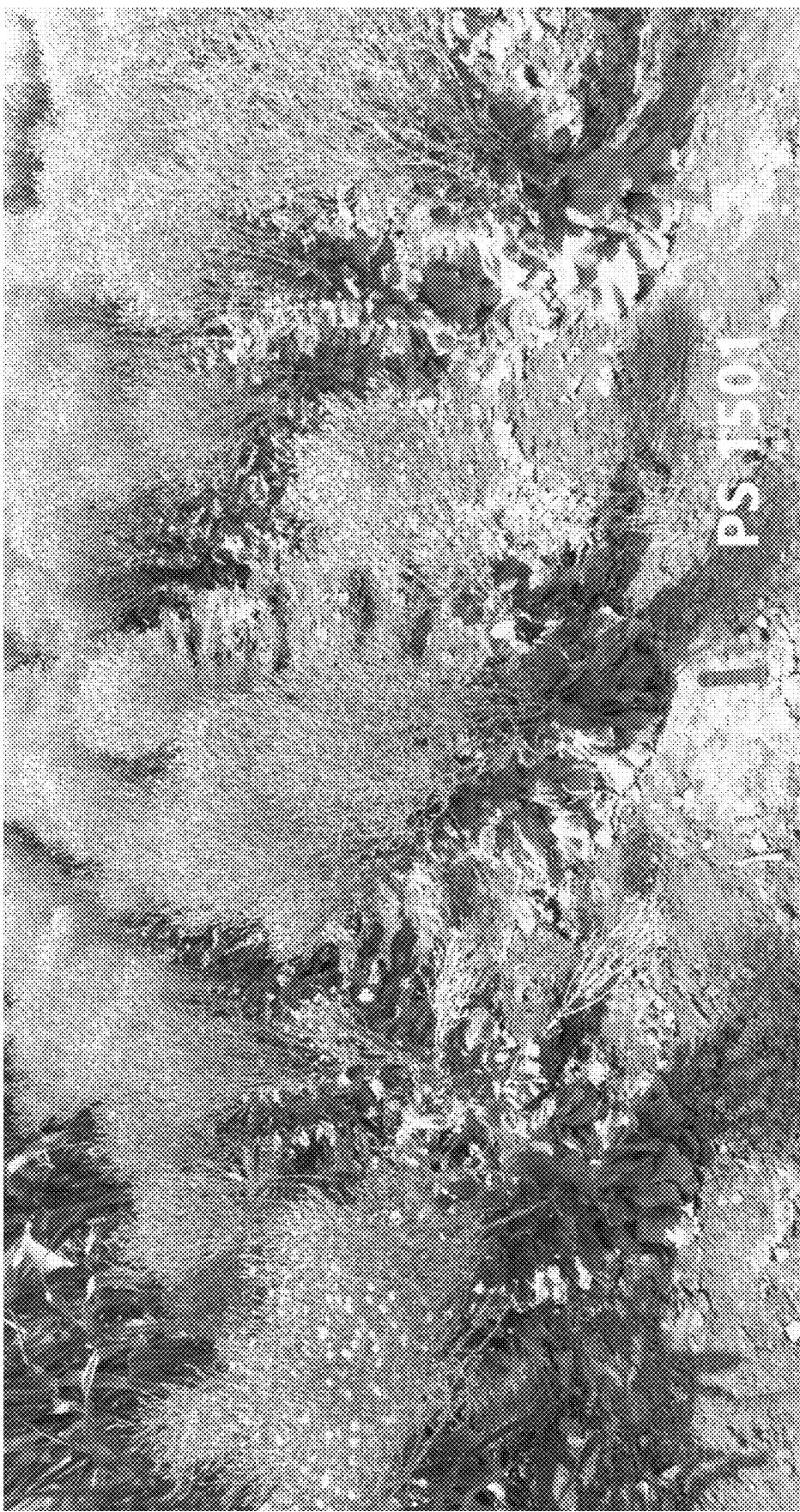
**FIG. 2K**



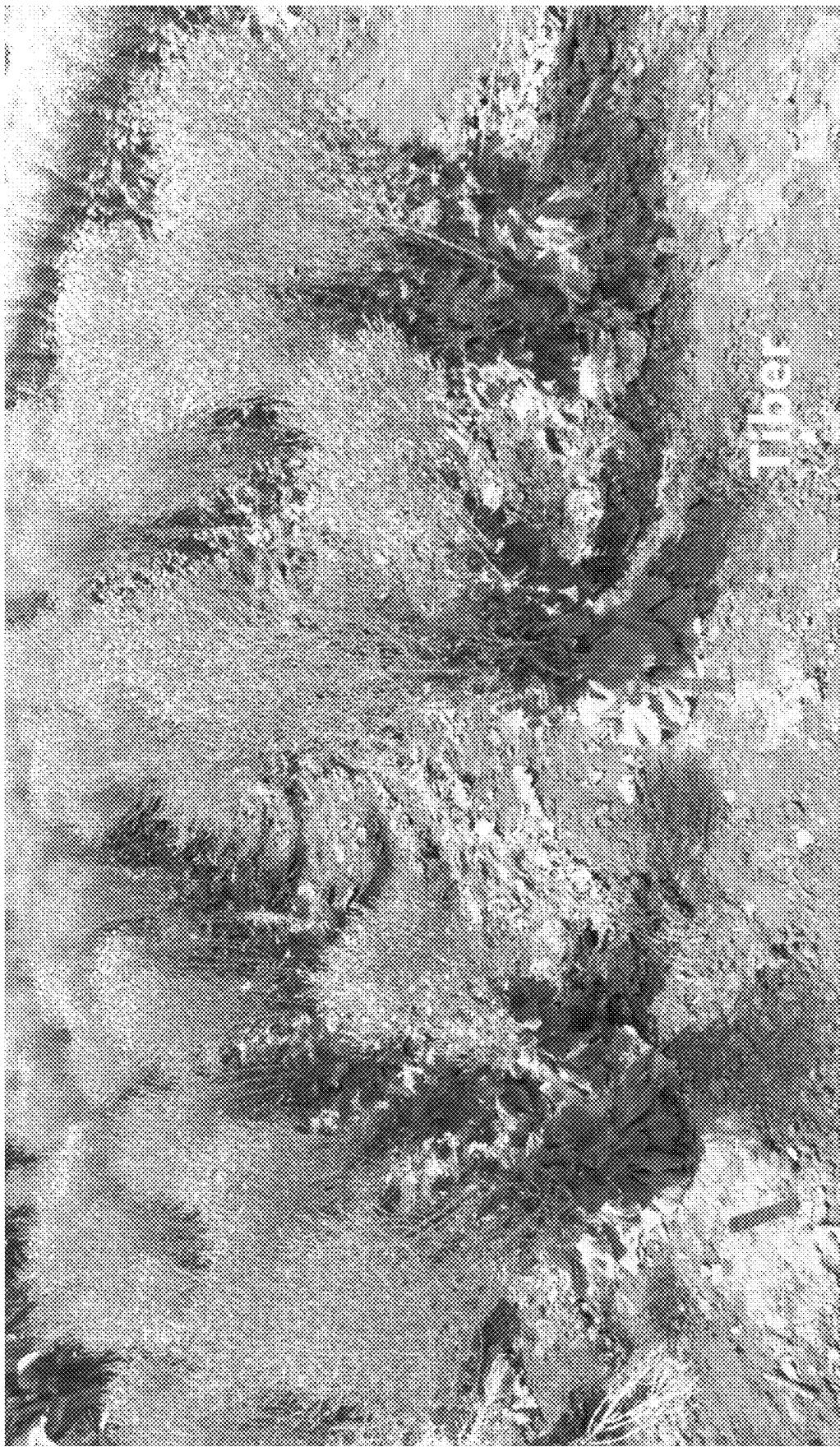
**FIG. 2L**



**FIG. 2M**



**FIG. 2N**



**FIG. 20**

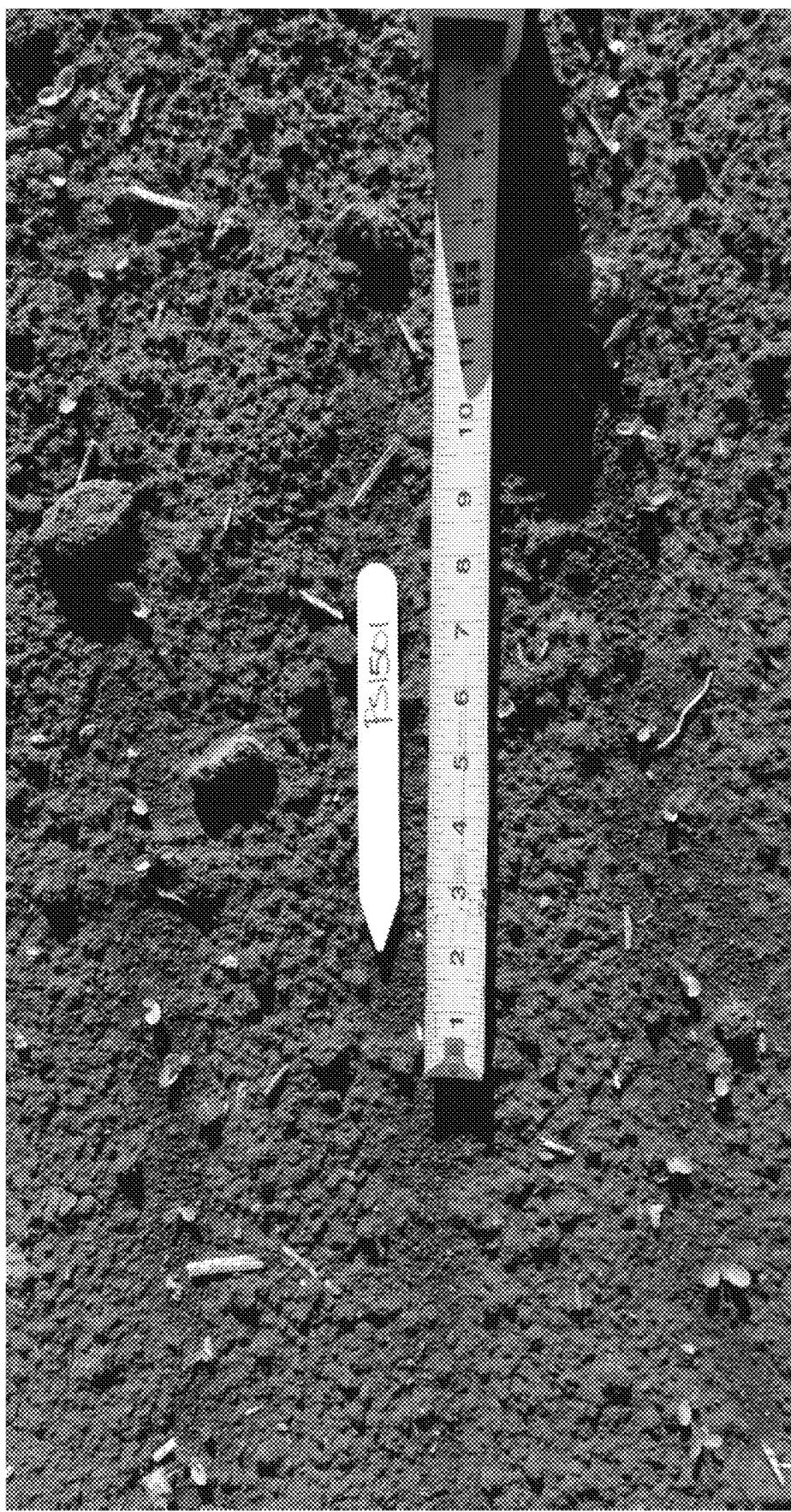


FIG. 2P

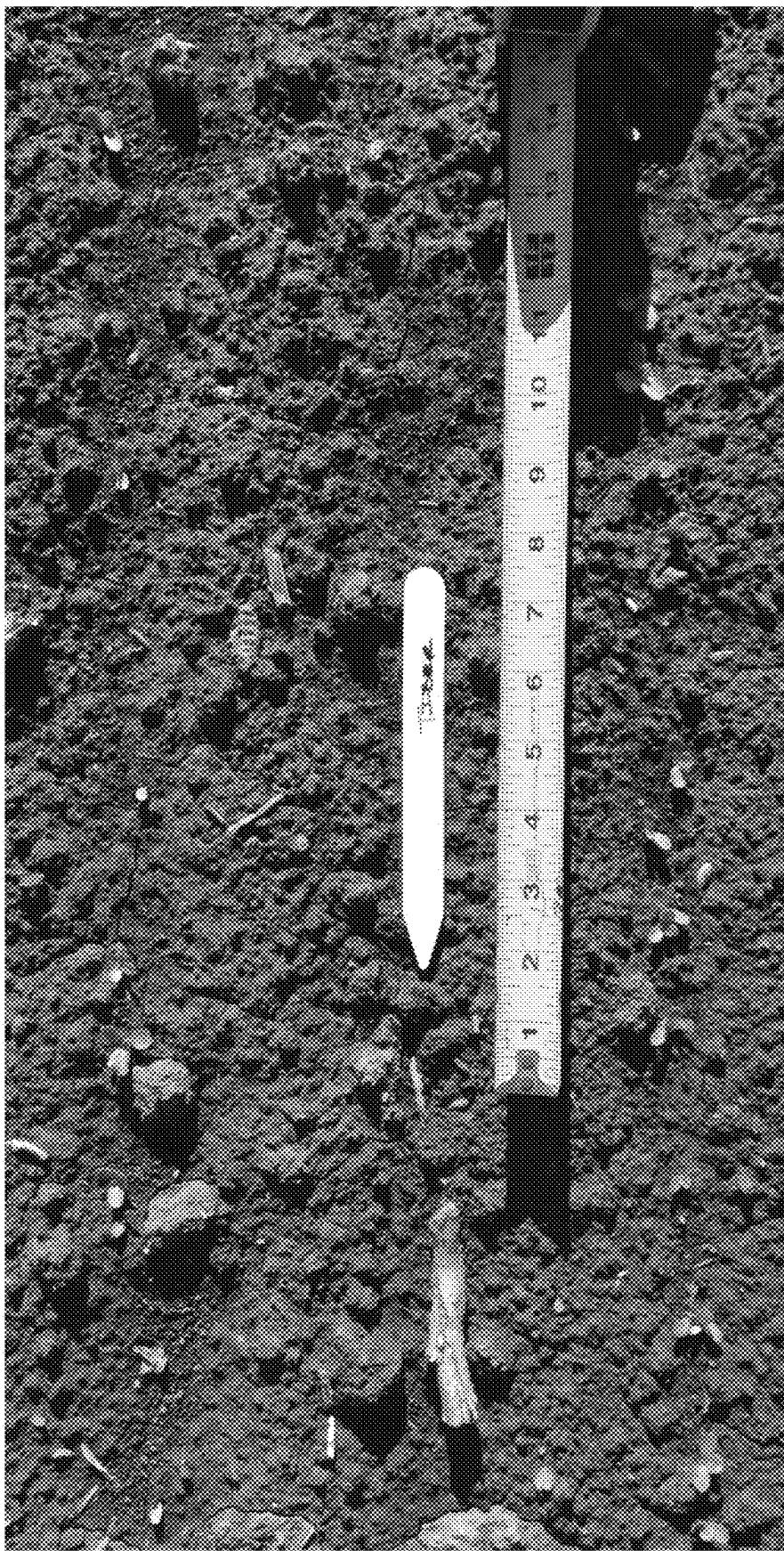


FIG. 2Q



**FIG. 3A**



**FIG. 3B**



**FIG. 3C**



**FIG. 3D**



**Pacific Height**

**FIG. 3E**

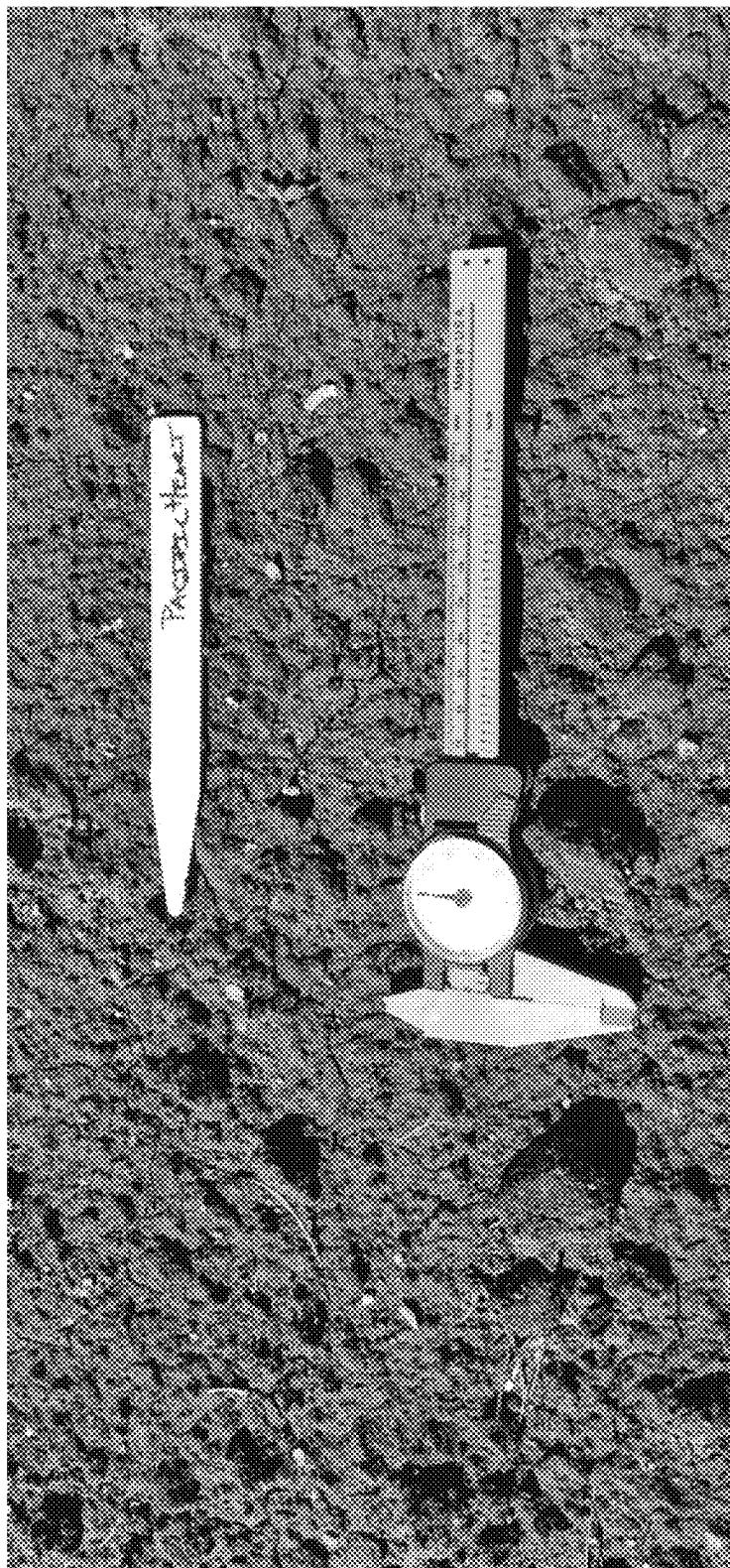


FIG. 3F



**FIG. 4A**



FIG. 4B



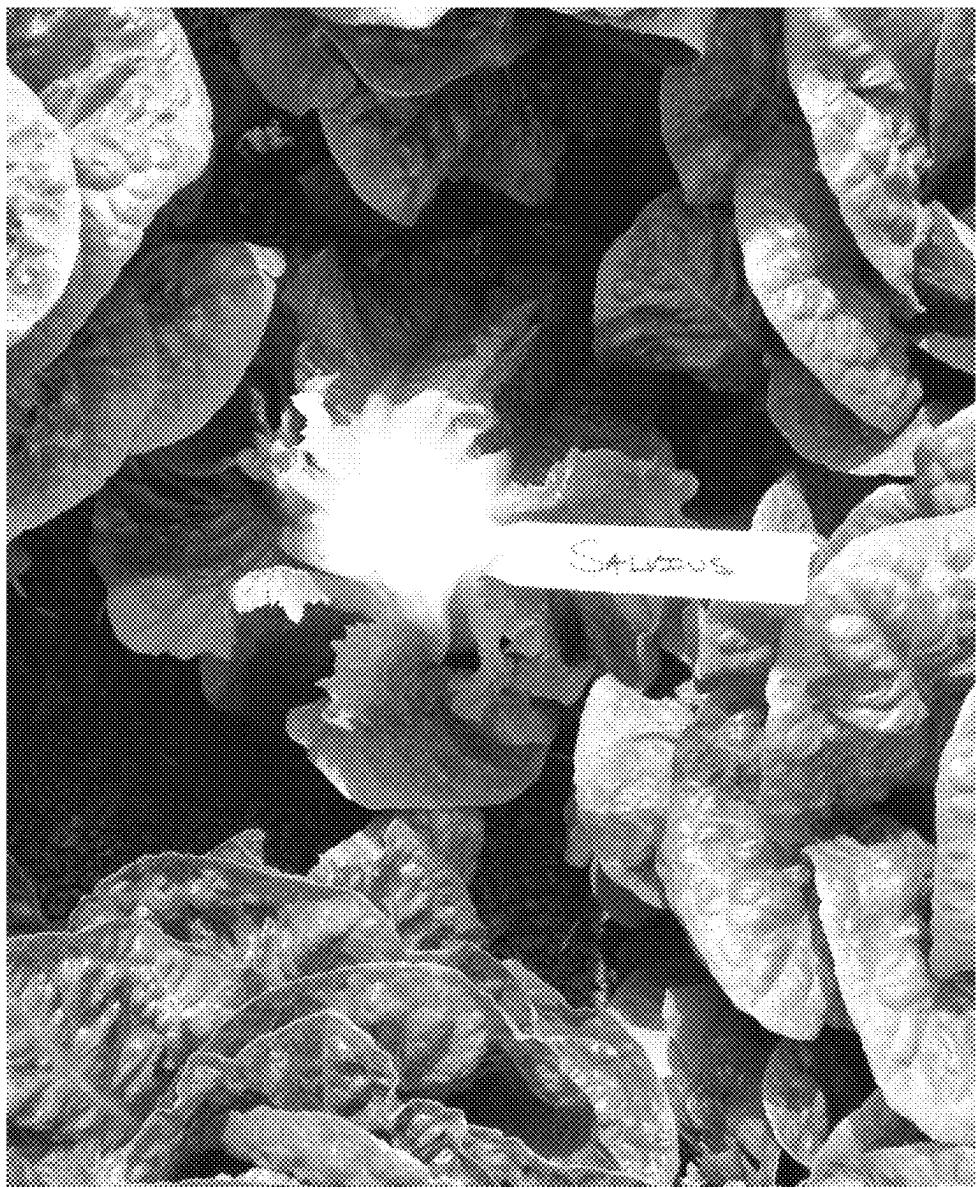
**FIG. 4C**



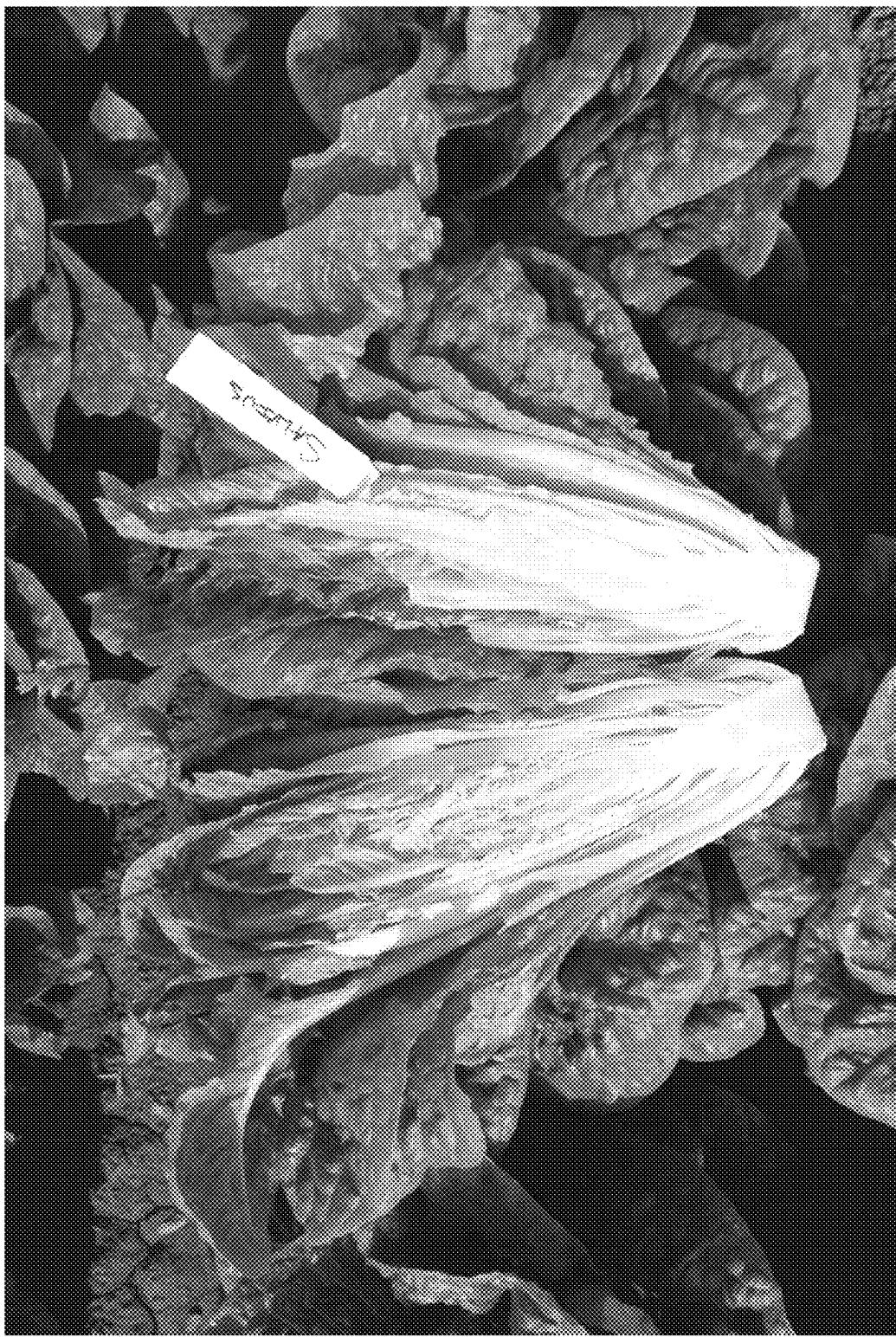
**FIG. 4D**



**FIG. 4E**



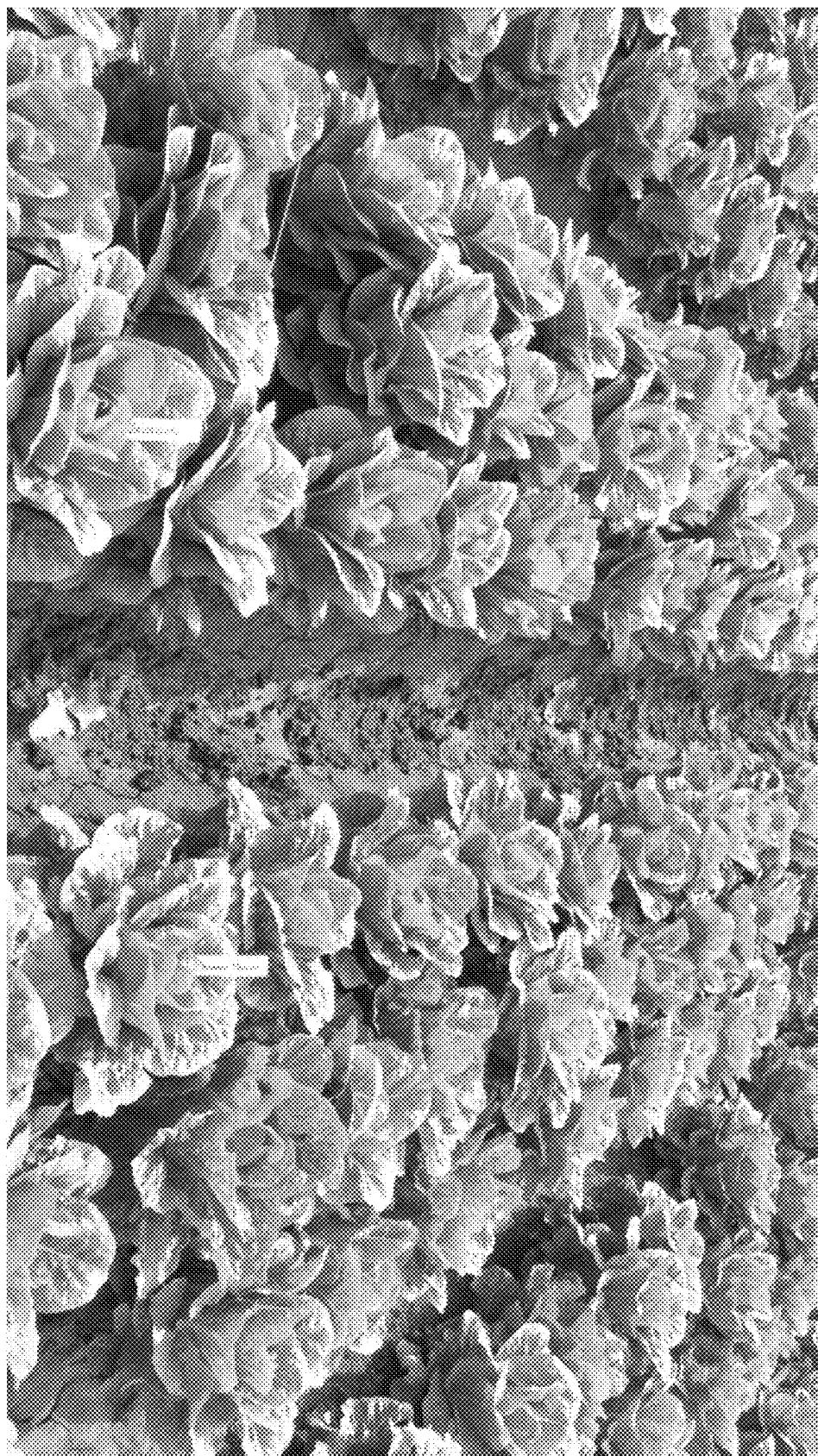
**FIG. 4F**



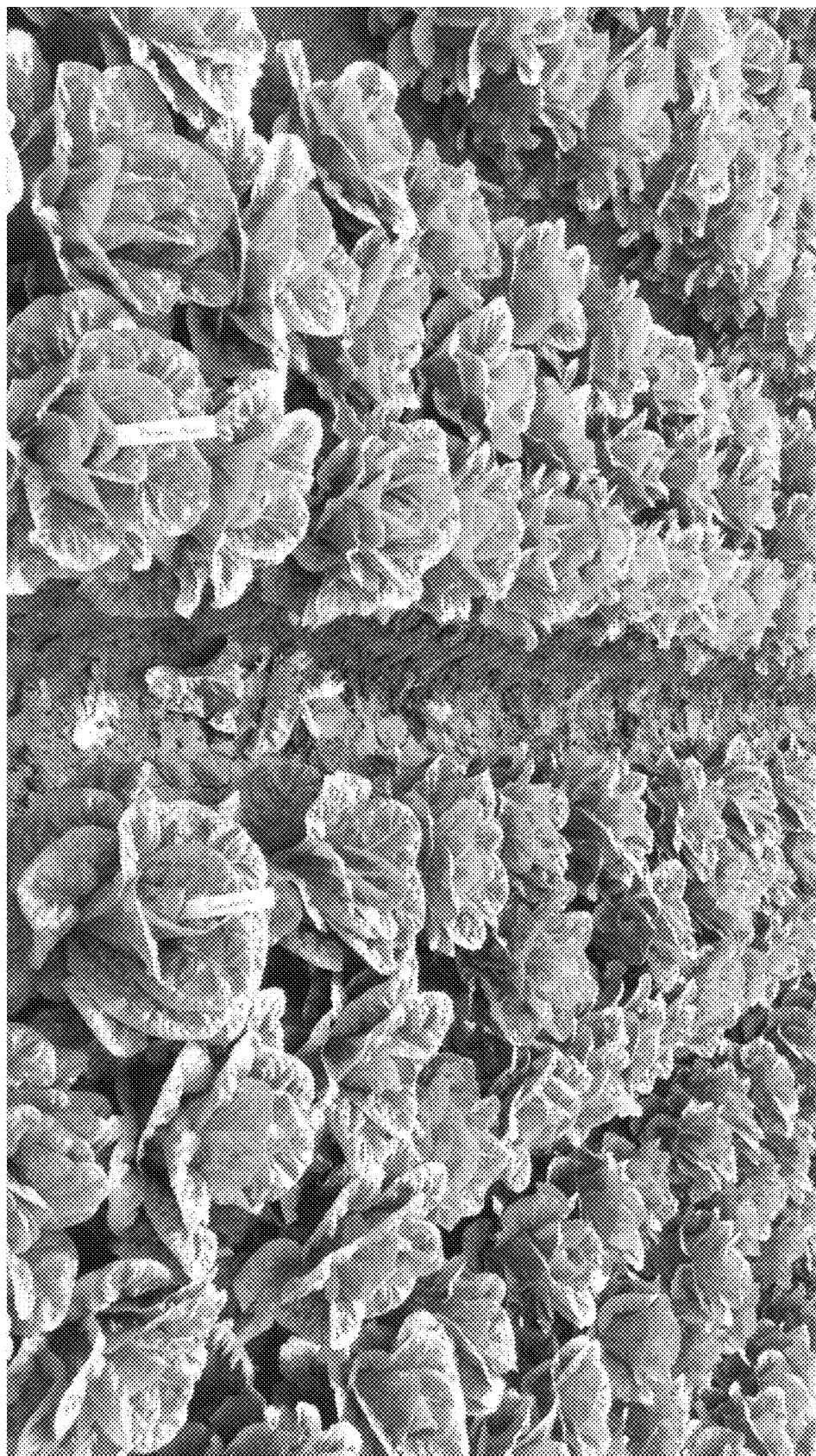
**FIG. 4G**



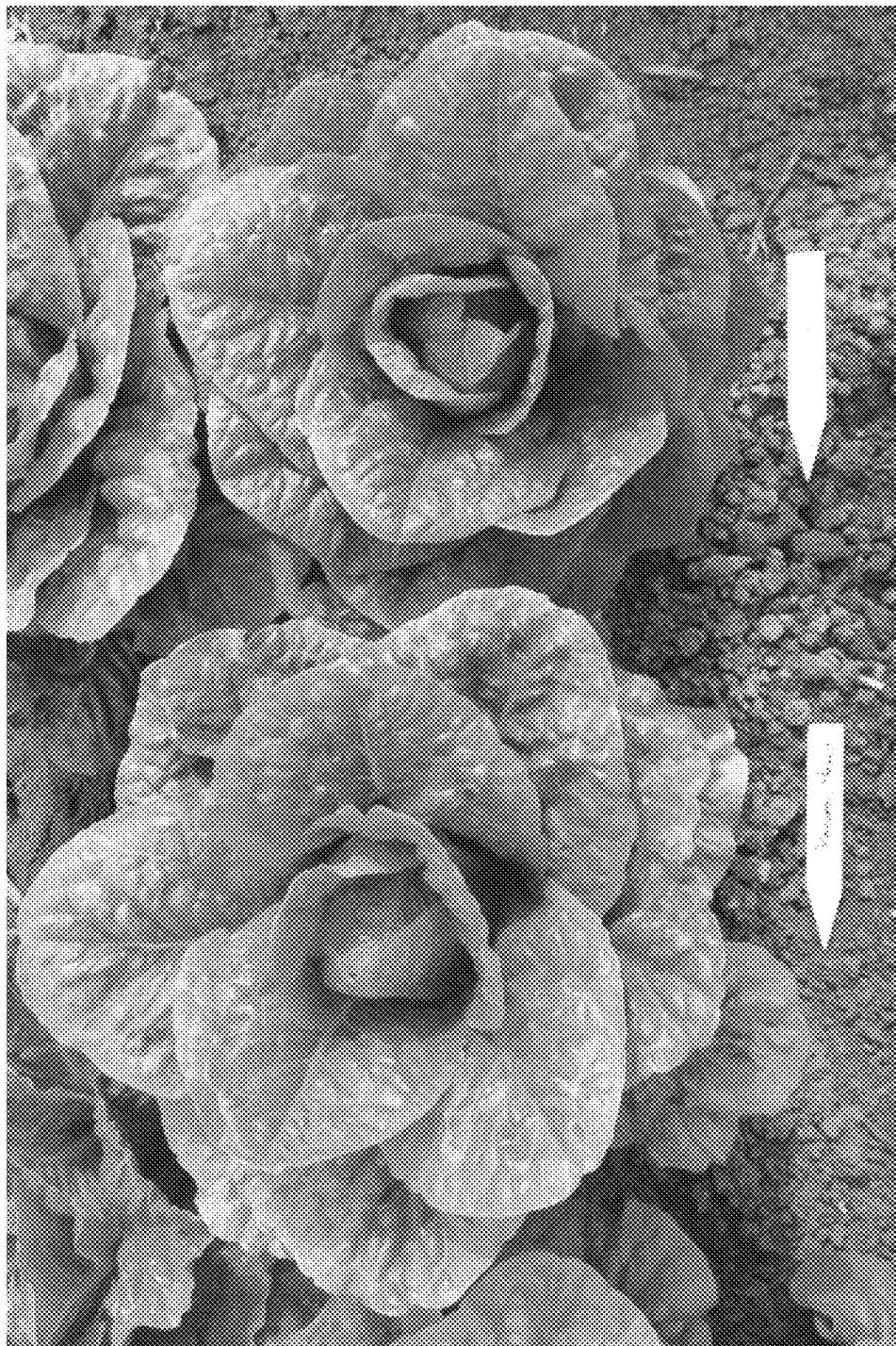
**FIG. 4H**



**FIG. 4I**



**FIG. 4J**



**FIG. 4K**



FIG. 4L



FIG. 4M



FIG. 4N

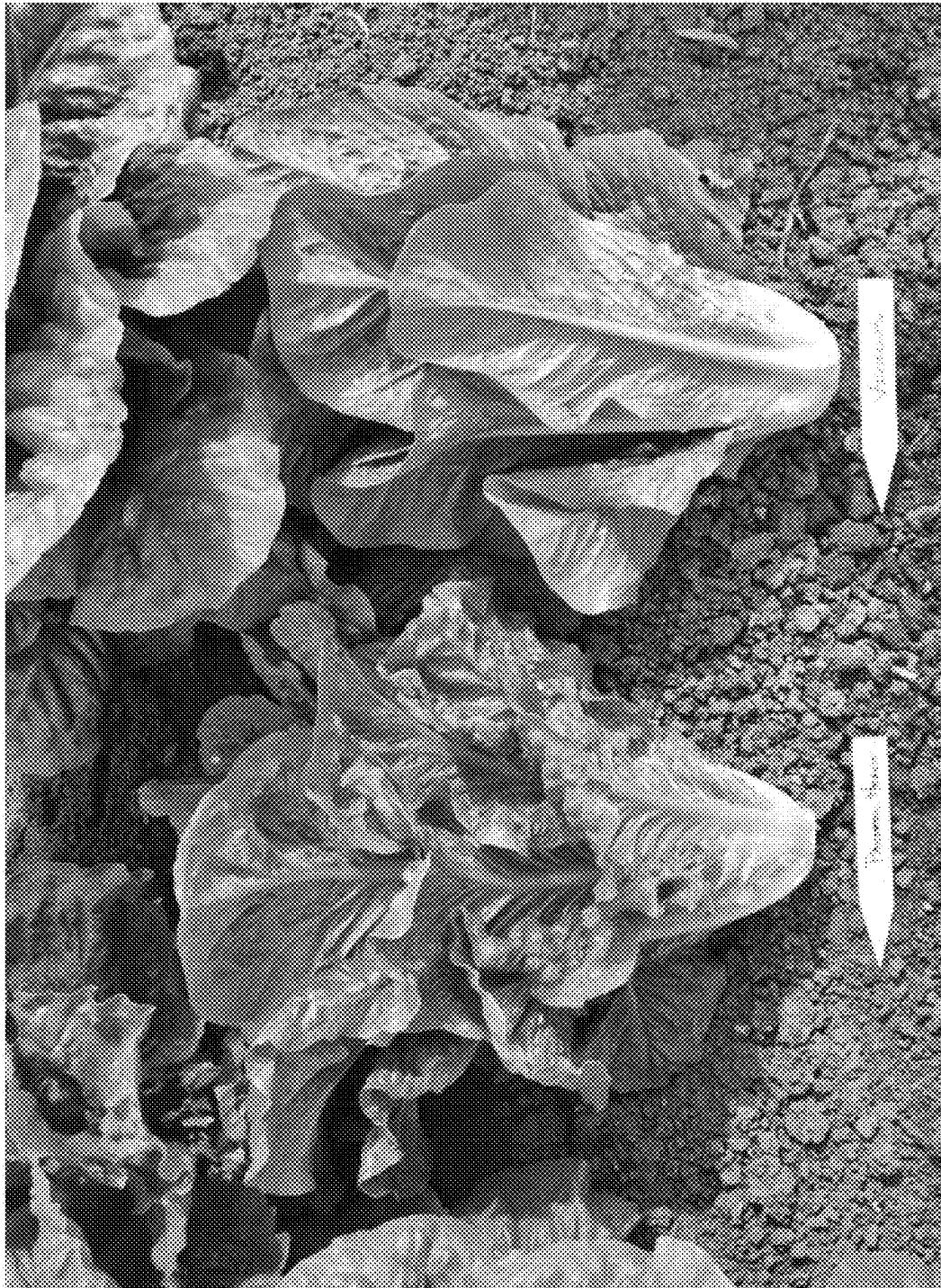


FIG. 40



FIG. 4P



FIG. 4Q



**FIG. 4R**



FIG. 4S

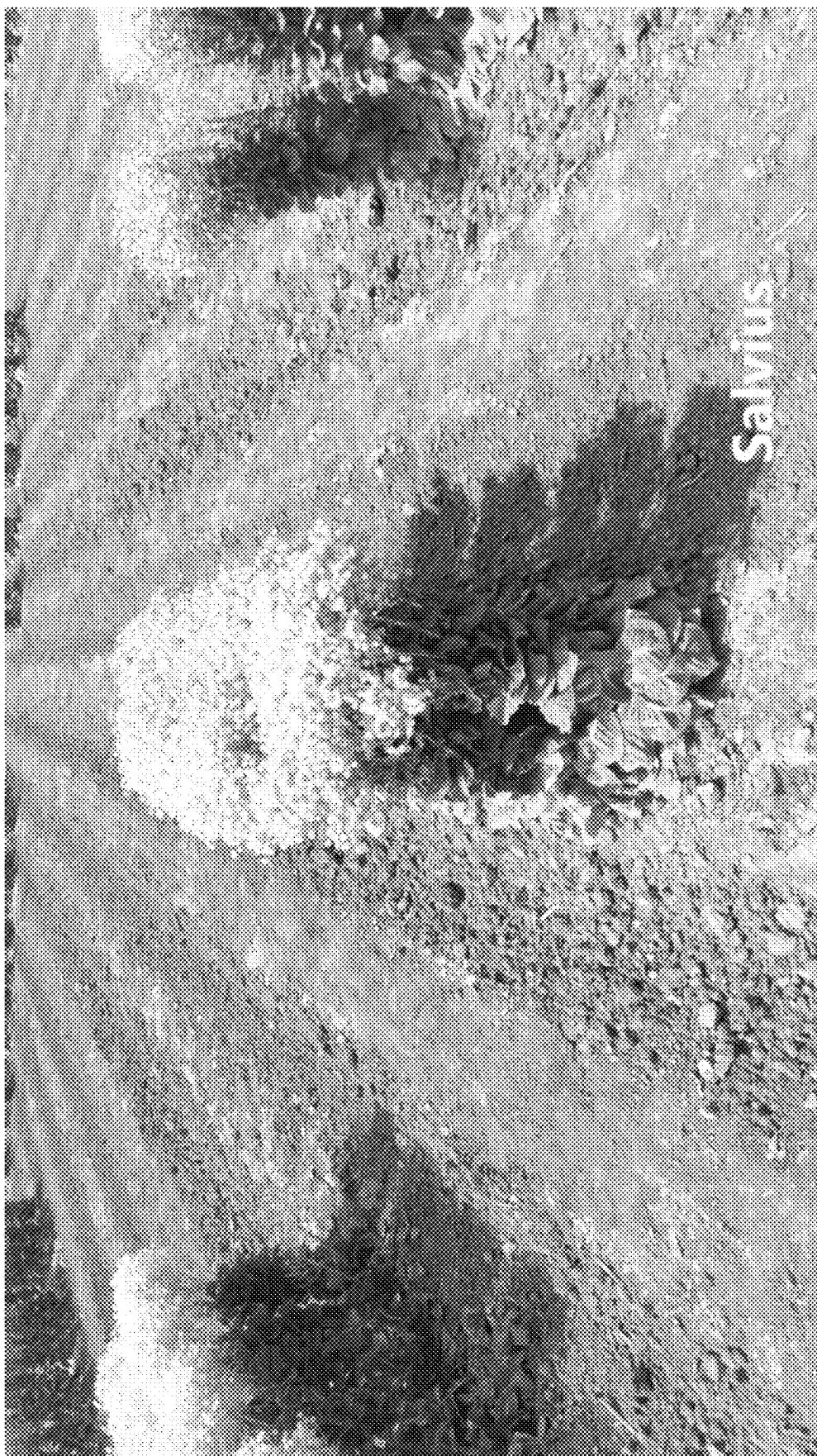


FIG. 4T

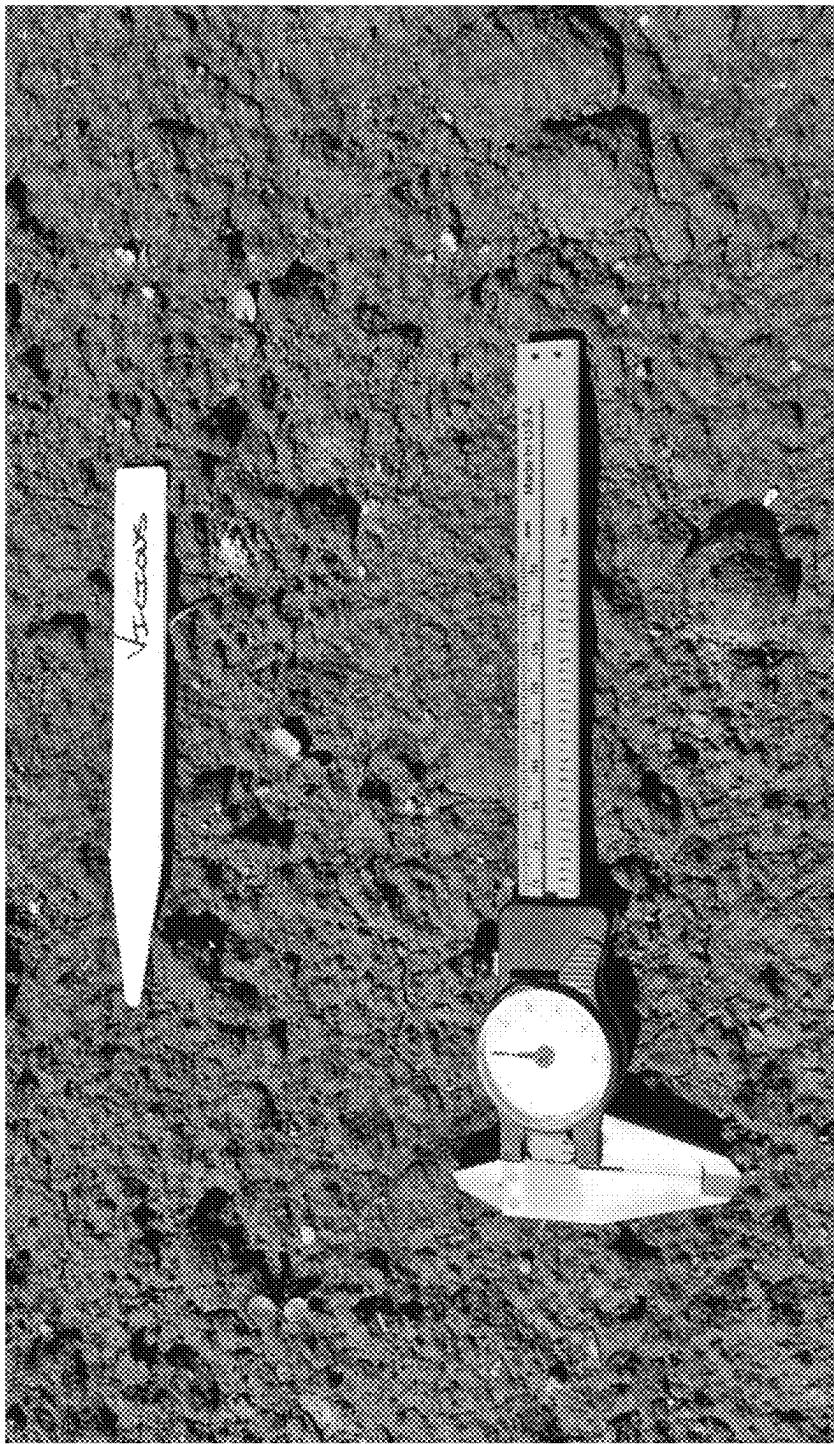


FIG. 4U

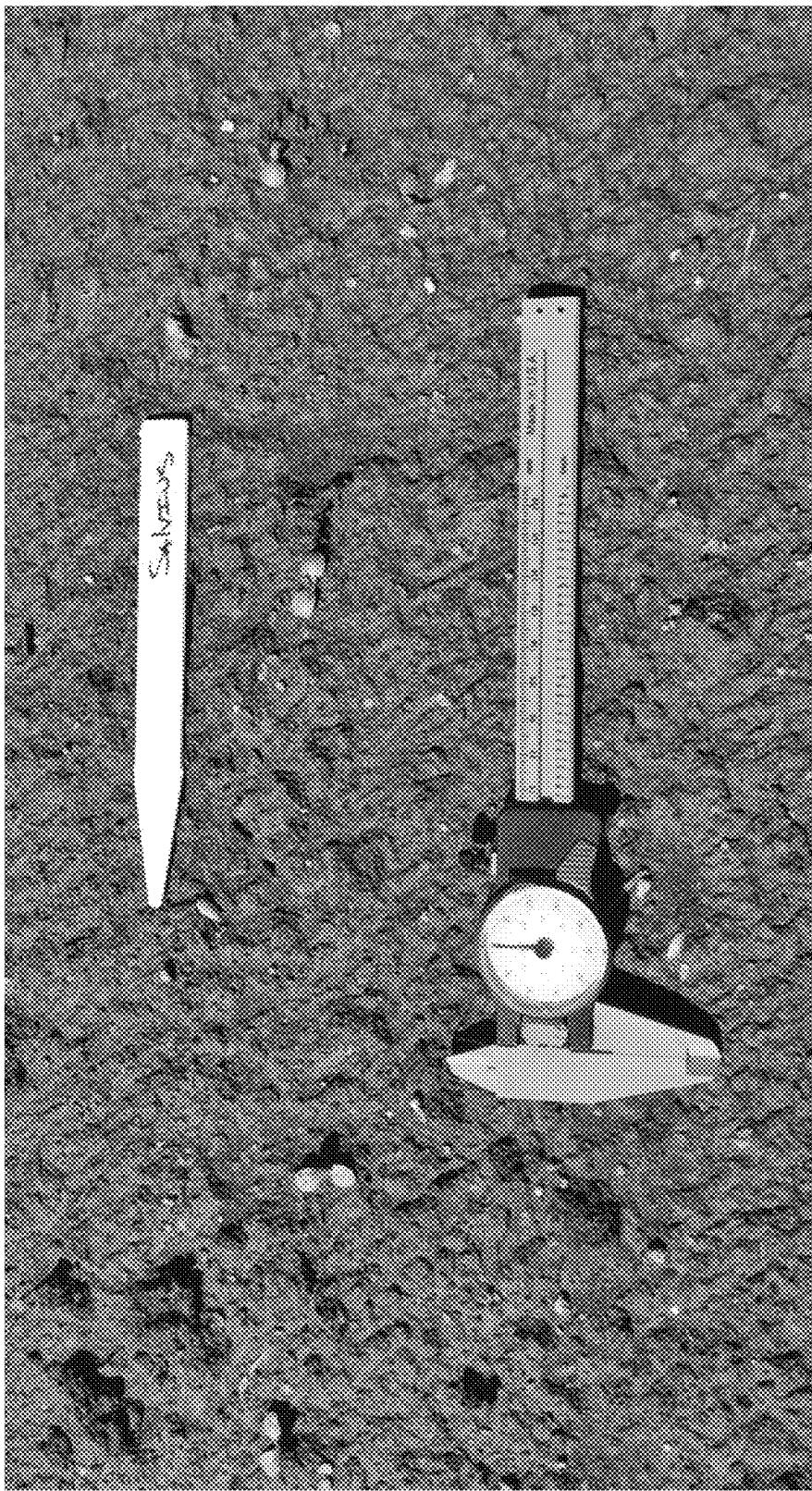


FIG. 4V



**FIG. 5A**



**FIG. 5B**



**FIG. 5C**



**FIG. 5D**



**FIG. 5E**



**FIG. 5F**



**FIG. 5G**



**FIG. 5H**



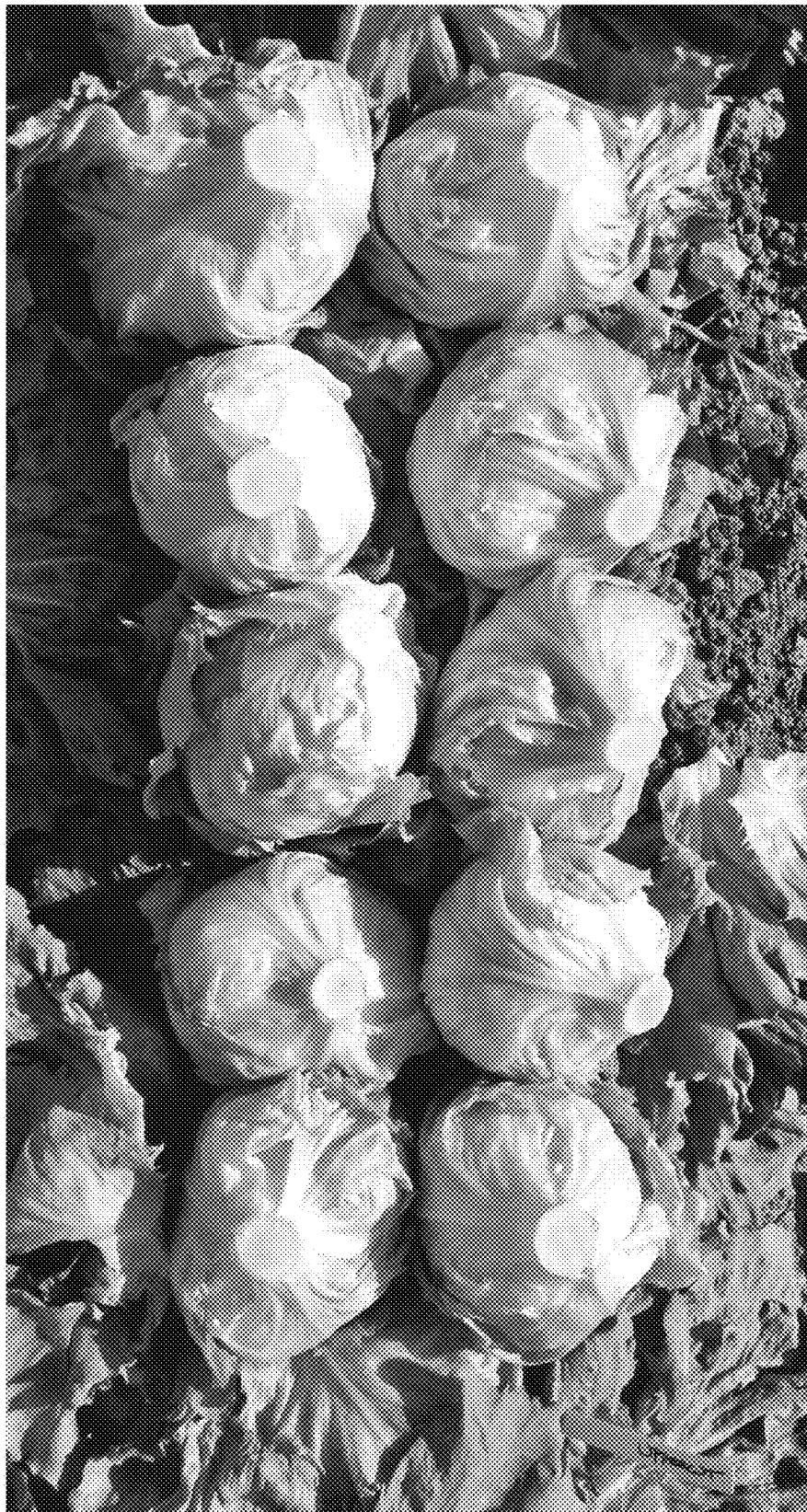
**FIG. 5I**



**FIG. 5J**



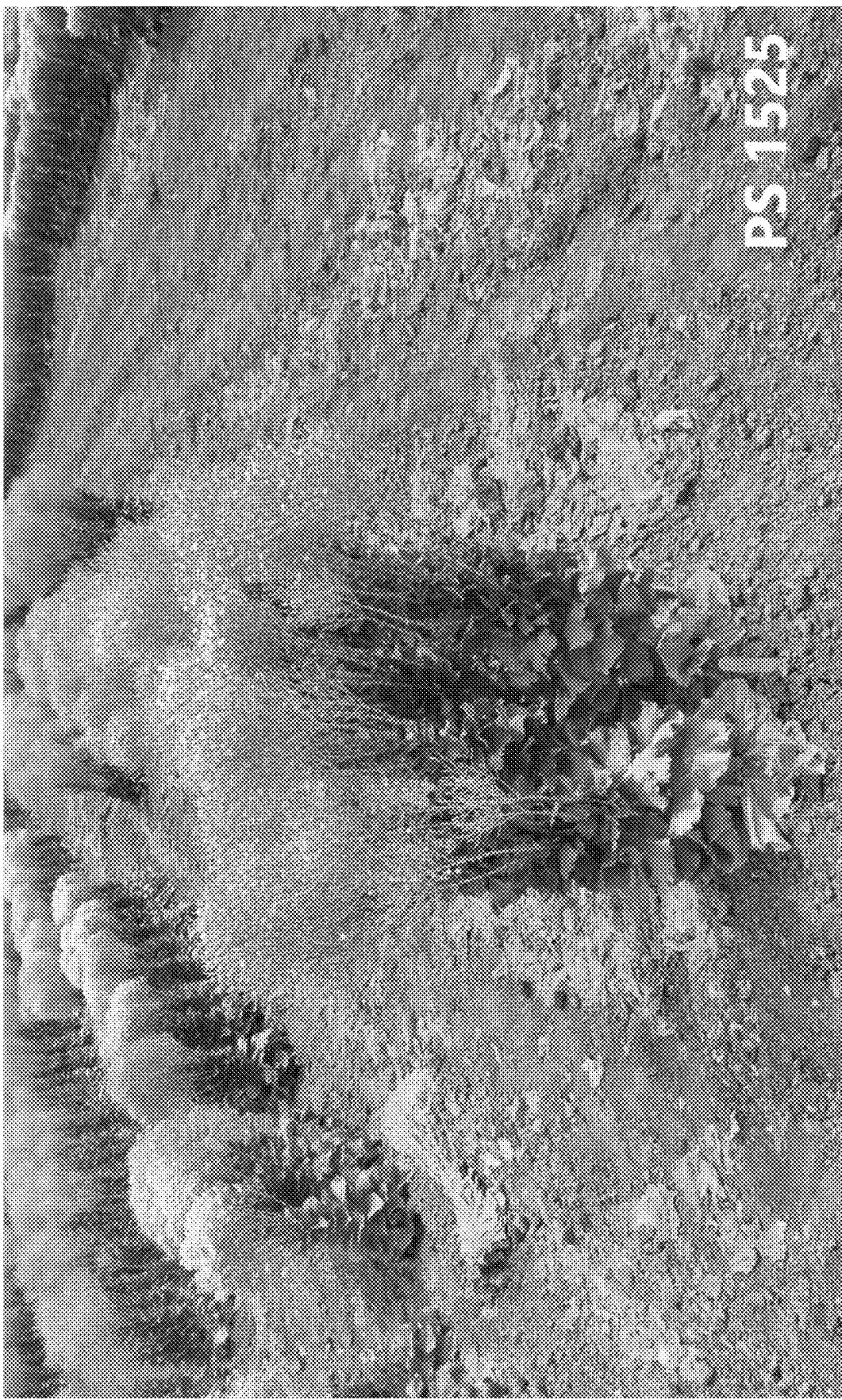
**FIG. 5K**



**FIG. 5L**



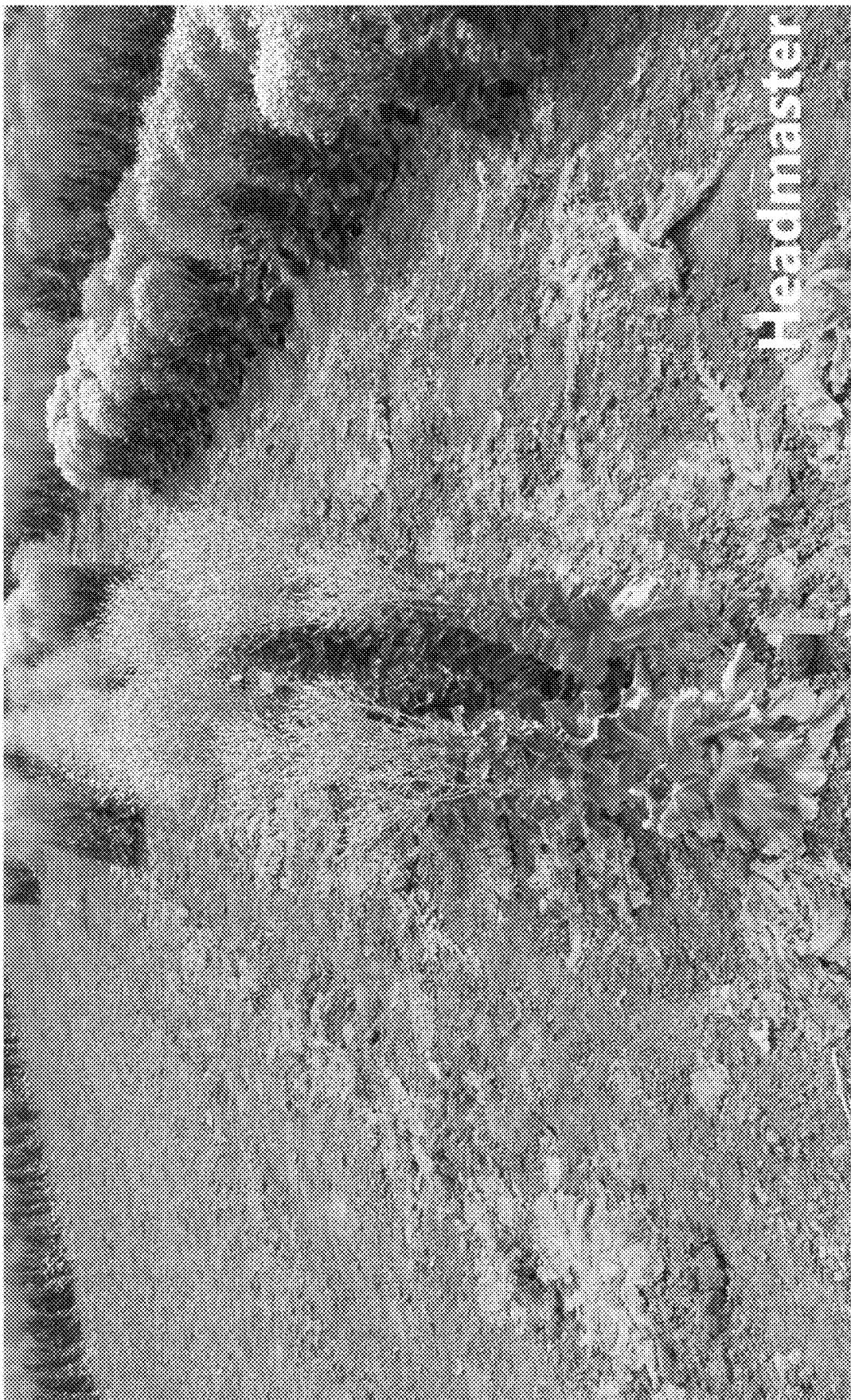
**FIG. 5M**



**FIG. 5N**



**FIG. 50**



**Headmaster**

**FIG. 5P**

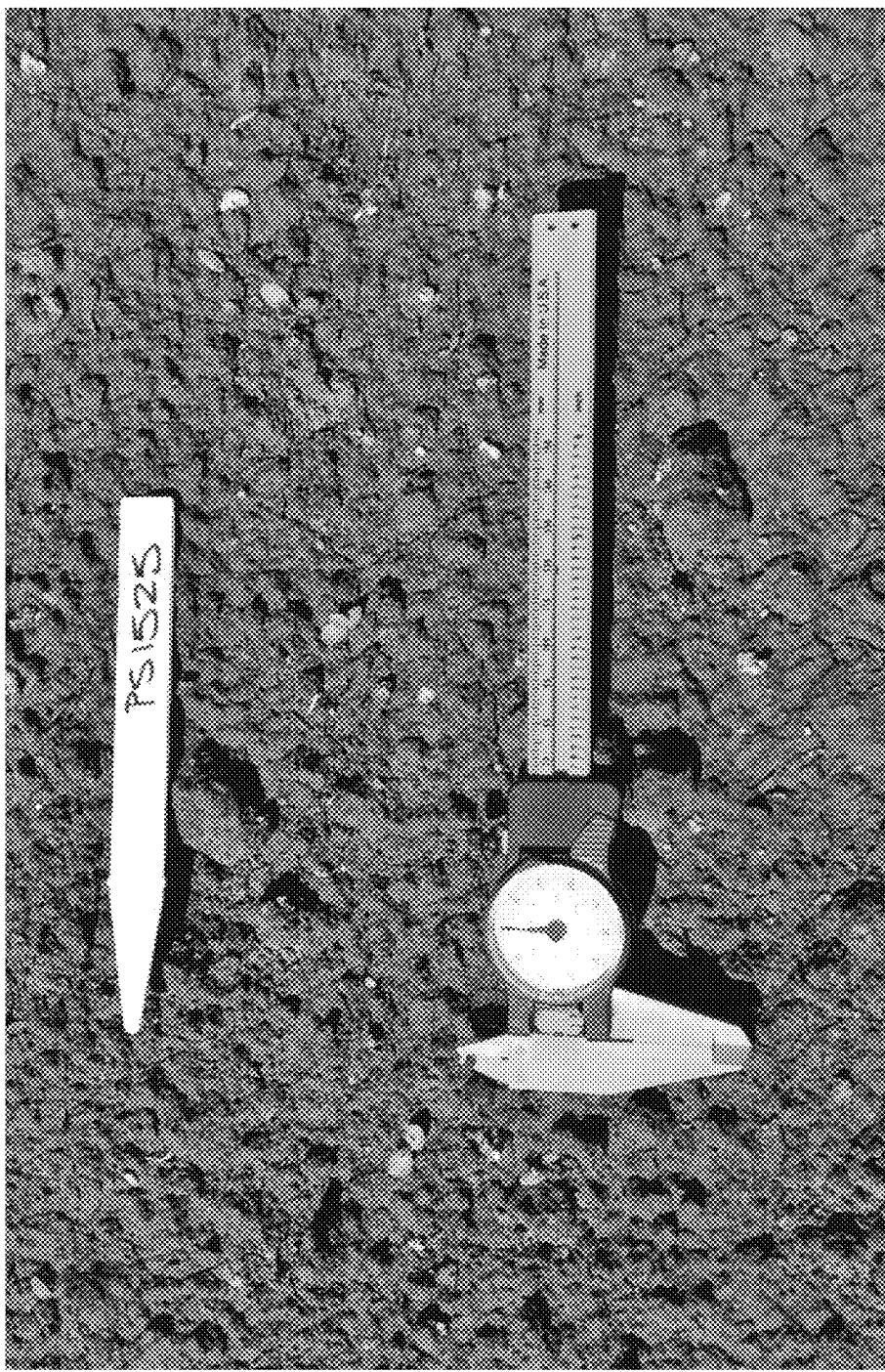


FIG. 5Q

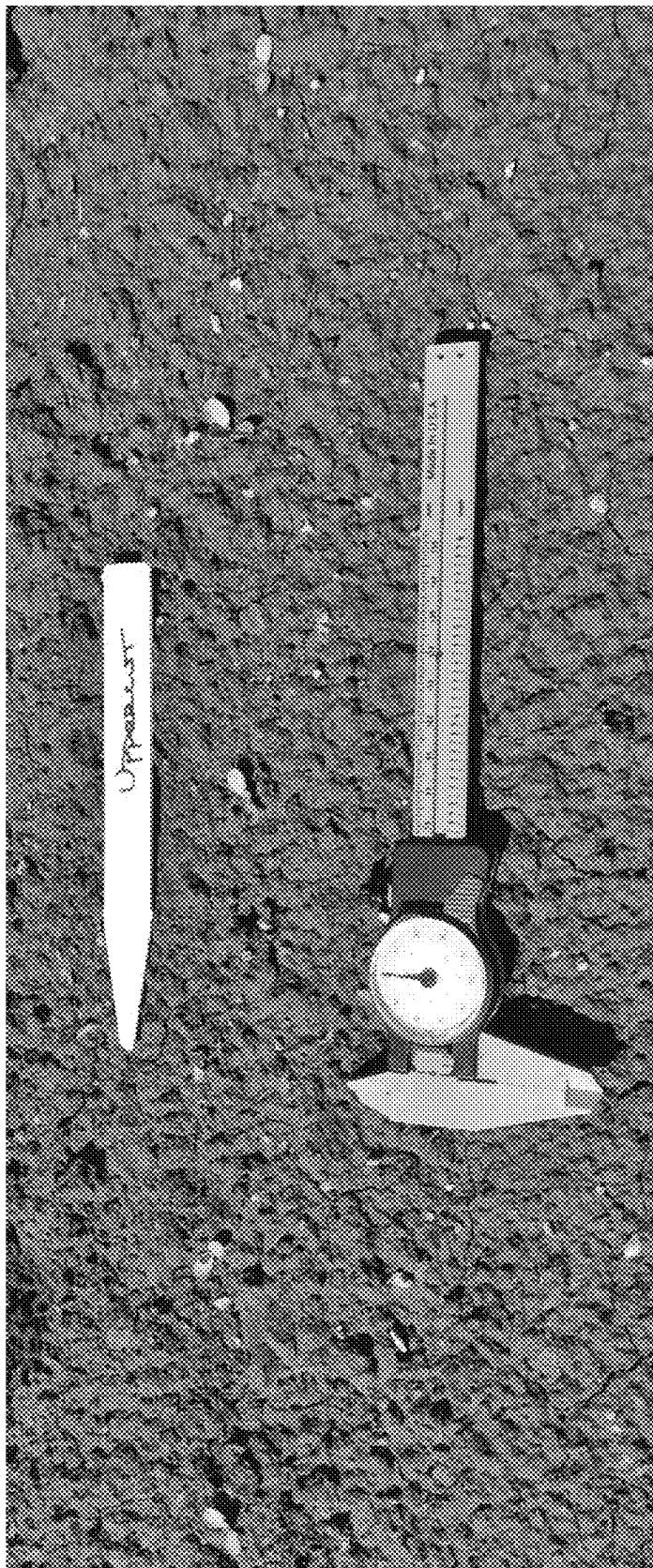
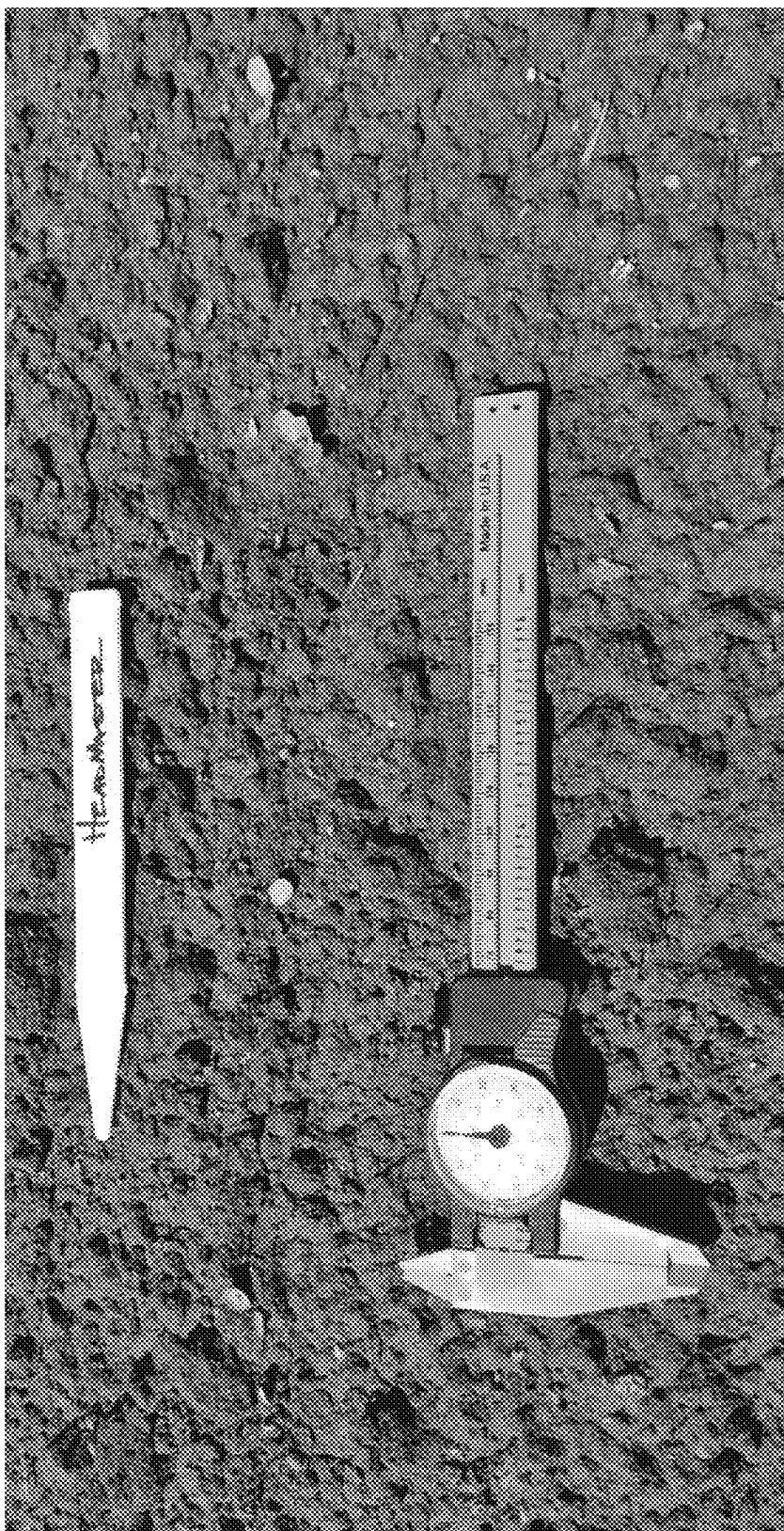


FIG. 5R



**FIG. 5S**

## 1

## LETTUCE VARIETY 'PS 1525'

CROSS-REFERENCE TO RELATED  
APPLICATION

This application claims the benefit of U.S. Provisional Application No. 63/178,895, filed Apr. 23, 2021, which is hereby incorporated by reference in its entirety.

## FIELD

This invention relates to the field of plant breeding. In particular, this invention relates to new lettuce, *Lactuca sativa*, varieties 'Latitude', 'Pacific Heart', and 'PS 1525'.

## BACKGROUND

Lettuce is an increasingly popular crop. Worldwide lettuce consumption continues to increase. As a result of this demand, there is a continued need for new lettuce varieties. In particular, there is a need for improved lettuce varieties that are stable, high yielding, and agronomically sound.

## SUMMARY

In order to meet these needs, the present invention is directed to improved lettuce varieties.

In one embodiment, the present invention is directed to lettuce, *Lactuca sativa*, seed designated as 'Latitude'. In one embodiment, the present invention is directed to a *Lactuca sativa* lettuce plant and parts isolated therefrom produced by growing 'Latitude' lettuce seed. In another embodiment, the present invention is directed to a *Lactuca sativa* plant and parts isolated therefrom having all the physiological and morphological characteristics of a *Lactuca sativa* plant produced by growing 'Latitude' lettuce seed. In still another embodiment, the present invention is directed to an  $F_1$  hybrid *Lactuca sativa* lettuce seed, plants grown from the seed, and a head isolated therefrom having 'Latitude' as a parent, where 'Latitude' is grown from 'Latitude' lettuce seed.

Lettuce plant parts include lettuce heads, lettuce leaves, parts of lettuce leaves, pollen, ovules, flowers, and the like. In another embodiment, the present invention is further directed to lettuce heads, lettuce leaves, parts of lettuce leaves, flowers, pollen, and ovules isolated from 'Latitude' lettuce plants. In another embodiment, the present invention is further directed to tissue culture of 'Latitude' lettuce plants, and to lettuce plants regenerated from the tissue culture, where the plant has all of the morphological and physiological characteristics of 'Latitude' lettuce plants.

The present invention is further directed to a method of selecting lettuce plants by: a) growing more than one 'Latitude' lettuce plant, where the plants are grown from lettuce seed; and b) selecting a plant from step a). The present invention is further directed to lettuce plants and seeds produced therefrom, where the lettuce plants and seeds are isolated by the selection method of the invention.

In another embodiment, the present invention is further directed to a method of breeding lettuce plants by crossing a lettuce plant with a plant grown from 'Latitude' lettuce seed. In still another embodiment, the present invention is further directed to lettuce plants, lettuce parts from the lettuce plants (e.g., lettuce heads), and seeds produced therefrom where the lettuce plant is isolated by the breeding method of the invention.

## 2

In one embodiment, the present invention is directed to lettuce, *Lactuca sativa*, seed designated as 'Pacific Heart'. In one embodiment, the present invention is directed to a *Lactuca sativa* lettuce plant and parts isolated therefrom produced by growing 'Pacific Heart' lettuce seed. In another embodiment, the present invention is directed to a *Lactuca sativa* plant and parts isolated therefrom having all the physiological and morphological characteristics of a *Lactuca sativa* plant produced by growing 'Pacific Heart' lettuce seed. In still another embodiment, the present invention is directed to an  $F_1$  hybrid *Lactuca sativa* lettuce seed, plants grown from the seed, and a heart isolated therefrom having 'Pacific Heart' as a parent, where 'Pacific Heart' is grown from 'Pacific Heart' lettuce seed.

Lettuce plant parts include lettuce hearts, lettuce leaves, parts of lettuce leaves, pollen, ovules, flowers, and the like. In another embodiment, the present invention is further directed to lettuce hearts, lettuce leaves, parts of lettuce leaves, flowers, pollen, and ovules isolated from 'Pacific Heart' lettuce plants. In another embodiment, the present invention is further directed to tissue culture of 'Pacific Heart' lettuce plants, and to lettuce plants regenerated from the tissue culture, where the plant has all of the morphological and physiological characteristics of 'Pacific Heart' lettuce plants.

The present invention is further directed to a method of selecting lettuce plants by: a) growing more than one 'Pacific Heart' lettuce plant, where the plants are grown from lettuce seed; and b) selecting a plant from step a). The present invention is further directed to lettuce plants and seeds produced therefrom, where the lettuce plants and seeds are isolated by the selection method of the invention.

In another embodiment, the present invention is further directed to a method of breeding lettuce plants by crossing a lettuce plant with a plant grown from 'Pacific Heart' lettuce seed. In still another embodiment, the present invention is further directed to lettuce plants, lettuce parts from the lettuce plants (e.g., lettuce hearts), and seeds produced therefrom where the lettuce plant is isolated by the breeding method of the invention.

In one embodiment, the present invention is directed to lettuce, *Lactuca sativa*, seed designated as 'PS 1525' having ATCC Accession Number PTA-127758. In one embodiment, the present invention is directed to a *Lactuca sativa* lettuce plant and parts isolated therefrom produced by growing 'PS 1525' lettuce seed. In another embodiment, the present invention is directed to a *Lactuca sativa* plant and parts isolated therefrom having all the physiological and morphological characteristics of a *Lactuca sativa* plant produced by growing 'PS 1525' lettuce seed having ATCC Accession Number PTA-127758. In still another embodiment, the present invention is directed to an  $F_1$  hybrid *Lactuca sativa* lettuce seed, plants grown from the seed, and a head isolated therefrom having 'PS 1525' as a parent, where 'PS 1525' is grown from 'PS 1525' lettuce seed having ATCC Accession Number PTA-127758.

Lettuce plant parts include lettuce heads, lettuce leaves, parts of lettuce leaves, pollen, ovules, flowers, and the like. In another embodiment, the present invention is further directed to lettuce heads, lettuce leaves, parts of lettuce leaves, flowers, pollen, and ovules isolated from 'PS 1525' lettuce plants. In another embodiment, the present invention is further directed to tissue culture of 'PS 1525' lettuce plants, and to lettuce plants regenerated from the tissue culture, where the plant has all of the morphological and physiological characteristics of 'PS 1525' lettuce plants.

The present invention is further directed to a method of selecting lettuce plants by: a) growing more than one ‘PS 1525’ lettuce plant, where the plants are grown from lettuce seed having ATCC Accession Number PTA-127758; and b) selecting a plant from step a). The present invention is further directed to lettuce plants and seeds produced therefrom, where the lettuce plants and seeds are isolated by the selection method of the invention.

In another embodiment, the present invention is further directed to a method of breeding lettuce plants by crossing a lettuce plant with a plant grown from ‘PS 1525’ lettuce seed having ATCC Accession Number PTA-127758. In still another embodiment, the present invention is further directed to lettuce plants, lettuce parts from the lettuce plants (e.g., lettuce heads), and seeds produced therefrom where the lettuce plant is isolated by the breeding method of the invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawings will be provided by the office upon request and payment of the necessary fee.

FIGS. 1A-1F show lettuce variety ‘Latitude’. FIG. 1A shows a top view of plants of lettuce variety ‘Latitude’. FIG. 1B shows a bottom view of a head of lettuce variety ‘Latitude’. FIG. 1C shows a cross-sectional view of a head of lettuce variety ‘Latitude’. FIG. 1D shows a bottom view of heads of lettuce variety ‘Latitude’. FIG. 1E shows bolting plants of lettuce variety ‘Latitude’. FIG. 1F shows seedlings of lettuce variety ‘Latitude’.

FIGS. 2A-2Q show comparisons of lettuce variety ‘Latitude’ with lettuce varieties ‘PS 1501’ (unpatented; released as PI 673092) and ‘Tiber’ (unpatented; released as PI 635075). FIG. 2A shows a top view of a plant of lettuce variety ‘Latitude’ (top) and a plant of lettuce variety ‘PS 1501’ (bottom). FIG. 2B shows a top view of a plant of lettuce variety ‘Latitude’ (top) and a plant of lettuce variety ‘Tiber’ (bottom). FIG. 2C shows a bottom view of a head of lettuce variety ‘Latitude’ (top) and lettuce variety ‘PS 1501’ (bottom). FIG. 2D shows a bottom view of a head of lettuce variety ‘Latitude’ (top) and lettuce variety ‘Tiber’ (bottom). FIG. 2E shows a side view of a head of lettuce variety ‘Latitude’ (top) and a head of lettuce variety ‘PS 1501’ (bottom). FIG. 2F shows a side view of a head of lettuce variety ‘Latitude’ (top) and a head of lettuce variety ‘Tiber’ (bottom). FIG. 2G shows a cross-sectional view of a head of lettuce variety ‘Latitude’ (top) and a head of lettuce variety ‘PS 1501’ (bottom). FIG. 2H shows a cross-sectional view of a head of lettuce variety ‘Latitude’ (top) and a head of lettuce variety ‘Tiber’ (bottom). FIG. 2I shows a mature leaf of lettuce variety ‘Latitude’ (top) and a mature leaf of lettuce variety ‘PS 1501’ (bottom). FIG. 2J shows a mature leaf of lettuce variety ‘Latitude’ (top) and a mature leaf of lettuce variety ‘Tiber’ (bottom). FIG. 2K shows a bottom view of heads of lettuce variety ‘Latitude’. FIG. 2L shows a bottom view of heads of lettuce variety ‘PS 1501’. FIG. 2M shows a bottom view of heads of lettuce variety ‘Tiber’. FIG. 2N shows bolting plants of lettuce variety ‘PS 1501’. FIG. 2O shows bolting plants of lettuce variety ‘Tiber’. FIG. 2P shows seedlings of lettuce variety ‘PS 1501’. FIG. 2Q shows seedlings of lettuce variety ‘Tiber’.

FIGS. 3A-3F show lettuce variety ‘Pacific Heart’. FIG. 3A shows a top view of plants of lettuce variety ‘Pacific Heart’. FIG. 3B shows a bottom view of a plant of lettuce variety ‘Pacific Heart’. FIG. 3C shows a cross-sectional

view of a heart of lettuce variety ‘Pacific Heart’. FIG. 3D shows a bottom view of hearts of lettuce variety ‘Pacific Heart’. FIG. 3E shows bolting plants of lettuce variety ‘Pacific Heart’. FIG. 3F shows seedlings of lettuce variety ‘Pacific Heart’.

FIGS. 4A-4V show comparisons between lettuce varieties ‘Pacific Heart’, ‘Vicious’, and ‘Salvius’ (U.S. Pat. No. 8,389,810, variety designation “41-49 RZ”). FIG. 4A shows a top view of plants of lettuce variety ‘Vicious’. FIG. 4B shows a bottom view of a head of lettuce variety ‘Vicious’. FIG. 4C shows a cross-sectional view of a head of lettuce variety ‘Vicious’. FIG. 4D shows a bottom view of heads of lettuce variety ‘Vicious’. FIG. 4E shows a top view of plants of lettuce variety ‘Salvius’. FIG. 4F shows a bottom view of a head of lettuce variety ‘Salvius’. FIG. 4G shows a cross-sectional view of a head of lettuce variety ‘Salvius’. FIG. 4H shows a bottom view of heads of lettuce variety ‘Salvius’. FIG. 4I shows plants of lettuce varieties ‘Vicious’ (top) and ‘Pacific Heart’ (bottom). FIG. 4J shows plants of lettuce varieties ‘Pacific Heart’ (top) and ‘Salvius’ (bottom). FIG. 4K shows a top view of heads of lettuce varieties ‘Pacific Heart’ (left) and ‘Vicious’ (right). FIG. 4L shows a top view of heads of lettuce varieties ‘Pacific Heart’ (left) and ‘Salvius’ (right). FIG. 4M shows a bottom view of heads of lettuce varieties ‘Pacific Heart’ (left) and ‘Vicious’ (right). FIG. 4N shows a bottom view of heads of lettuce varieties ‘Pacific Heart’ (left) and ‘Salvius’ (right). FIG. 4O shows hearts of lettuce varieties ‘Pacific Heart’ (left) and ‘Vicious’ (right). FIG. 4P shows hearts of lettuce varieties ‘Pacific Heart’ (left) and ‘Salvius’ (right). FIG. 4Q shows a cross-sectional view of hearts of lettuce varieties ‘Pacific Heart’ (left) and ‘Vicious’ (right). FIG. 4R shows a cross-sectional view of hearts of lettuce varieties ‘Pacific Heart’ (left) and ‘Salvius’ (right). FIG. 4S shows bolting plants of lettuce variety ‘Vicious’. FIG. 4T shows bolting plants of lettuce variety ‘Salvius’. FIG. 4U shows seedlings of lettuce variety ‘Vicious’. FIG. 4V shows seedlings of lettuce variety ‘Salvius’.

FIGS. 5A-5S show comparisons between lettuce varieties ‘PS 1525’, ‘Uppercut’ (U.S. Patent Publication No. US 2021/0084853 A1), and ‘Headmaster’ (U.S. Plant Variety Protection Certificate No. 9800023). FIG. 5A shows plants of lettuce varieties ‘PS 1525’ (top) and ‘Uppercut’ (bottom). FIG. 5B shows plants of lettuce varieties ‘PS 1525’ (top) and ‘Headmaster’ (bottom). FIG. 5C shows a bottom view of heads of lettuce varieties ‘PS 1525’ (top) and ‘Uppercut’ (bottom). FIG. 5D shows a bottom view of heads of lettuce varieties ‘PS 1525’ (top) and ‘Headmaster’ (bottom). FIG. 5E shows a side view of heads of lettuce varieties ‘PS 1525’ (top) and ‘Uppercut’ (bottom). FIG. 5F shows a side view of heads of lettuce varieties ‘PS 1525’ (top) and ‘Headmaster’ (bottom). FIG. 5G shows a top view of heads of lettuce varieties ‘PS 1525’ (top) and ‘Uppercut’ (bottom). FIG. 5H shows a top view of heads of lettuce varieties ‘PS 1525’ (top) and ‘Headmaster’ (bottom). FIG. 5I shows a cross-sectional view of heads of lettuce varieties ‘PS 1525’ (top) and ‘Uppercut’ (bottom). FIG. 5J shows a cross-sectional view of heads of lettuce varieties ‘PS 1525’ (top) and ‘Headmaster’ (bottom). FIG. 5K shows a bottom view of heads of lettuce variety ‘PS 1525’. FIG. 5L shows a bottom view of heads of lettuce variety ‘Uppercut’. FIG. 5M shows a bottom view of heads of lettuce variety ‘Headmaster’. FIG. 5N shows bolting plants of lettuce variety ‘PS 1525’. FIG. 5O shows bolting plants of lettuce variety ‘Uppercut’. FIG. 5P shows bolting plants of lettuce variety ‘Headmaster’. FIG. 5Q shows seedlings of lettuce variety ‘PS 1525’. FIG.

5R shows seedlings of lettuce variety 'Uppercut'. FIG. 5S shows seedlings of lettuce variety 'Headmaster'.

## DETAILED DESCRIPTION

## Definitions

In order to more clearly understand the invention, the following definitions are provided:

Core Diameter: Core diameter is the diameter of the lettuce stem at the base of the cut head.

Core Length: Core length is the length of the vertically sliced lettuce plant as measured from the base of the cut stem to the top of the apex (growing point).

*Fusarium* Wilt: *Fusarium* wilt of lettuce is a disease caused by the fungus *Fusarium oxysporum* f. sp. *lactucae* that causes infected seedlings to wilt, and turn red or brown in color in inner tissues, and causes leaves of infected older plants to turn yellow and develop tip burn.

Head Diameter: Head diameter is the diameter of the vertically sliced iceberg lettuce plant head at its widest horizontal point, perpendicular to the stem.

Head Length: Head length is the diameter of the vertically sliced iceberg lettuce plant head as measured from the base of the cut stem to the cap leaf.

Heart: Heart is the portion in the center of romaine type lettuces where the leaf tips curve inward to cover the growing point. Cut and trimmed hearts of romaine type lettuces can be obtained by removing the frame leaves and cutting the stem off just below the base of the outermost heart leaf.

Heart Length: Heart length is the length of the vertically sliced romaine lettuce plant as measured from the base of the cut stem to the top leaf margin of the longest outermost leaf that encloses the green leaf heart.

Lettuce Mosaic Virus: A disease that can cause a stunted, deformed, or mottled pattern in young lettuce and yellow, twisted, and deformed leaves in older lettuce.

Maturity Date: Maturity refers to the stage when the plants are of full size or optimum weight, in marketable form or shape to be of commercial or economic value.

Munsell: Munsell refers to the Munsell Color Chart, which uses the Munsell color system.

*Nasonovia ribisnigri*: A lettuce aphid that colonizes the innermost leaves of the lettuce plant, contaminating areas that cannot be treated easily with insecticides.

Plant Diameter: The plant diameter is a measurement across the top of the lettuce plant at its widest point. The measurement of frame diameter is taken from the outer most leaf tip horizontally to the outer most leaf tip.

Tip burn: Means a browning of the edges or tips of lettuce leaves that is a physiological response to a lack of calcium.

*Verticillium* Wilt: *Verticillium* Wilt of lettuce is a disease caused by the fungus *Verticillium dahliae* that can cause the basal leaves that cover the outer part of the lettuce head to wilt and then collapse, leading to premature plant death and an unharvestable head.

Taking into account these definitions, the present invention is directed to seeds of the lettuce varieties 'Latitude', 'Pacific Heart', and 'PS 1525' and plants produced by growing 'Latitude', 'Pacific Heart', and/or 'PS 1525' lettuce seeds; heads or hearts isolated or harvested from the plants; one or more plants selected from a collection of 'Latitude', 'Pacific Heart', and/or 'PS 1525' plants and seeds derived or produced therefrom; and plants produced by crossing a lettuce plant with a 'Latitude', 'Pacific Heart', and/or 'PS 1525' lettuce plant and seeds derived or produced therefrom.

## Objective Description of the Variety 'Latitude'

'Latitude' is an iceberg lettuce variety. This variety is distinct and unique to all other iceberg lettuce varieties due to its resistance to *Verticillium* Wilt race 1, as well as characteristics including its green color, head weight, core diameter, head diameter, time to maturity, and core length. 'Latitude' has displayed outstanding yield and shipping qualities in the months when *Verticillium* Wilt can be at its highest levels. 'Latitude' has a growing season that includes summer in West Coast regions of the United States, such as Salinas, California, and is suitable for growing in the open. FIGS. 1A-1F depict plants, heads, and seedlings of lettuce variety 'Latitude'. Lettuce variety 'Latitude' is the result of numerous generations of plant selections chosen for its high degree of resistance to *Verticillium* Wilt race 1.

The variety has shown uniformity and stability for the traits, within the limits of environmental influence for the traits. It has been self-pollinated a sufficient number of generations with careful attention to uniformity of plant type. The line has been increased with continued observation for uniformity. No variant traits have been observed or are expected in variety 'Latitude'.

Lettuce variety 'Latitude' has the following morphologic and other characteristics:

25 Plant Type: Crisp (i.e., Iceberg)

Seed:

Color: Black (grey brown)

Light dormancy: Light required

Heat dormancy: Not susceptible

30 Cotyledon to Fourth Leaf Stage:

Shape of cotyledons: Broad

Shape of fourth leaf: Round

Fourth leaf length: 19.8 mm

Fourth leaf width: 9.4 mm

35 Fourth leaf index (length/width×10): 21.01

Apical margin: Finely dentate

Basal margin: Finely dentate

Green color: Medium green

Anthocyanin distribution: Absent

Cupping: Slight

Reflexing: Apical margin

Mature Leaves:

Margin:

Incision depth (deepest penetration of the margin):  
Moderate

Indentation (finest divisions of the margin): Crenate

Undulation of apical margin: Moderate

Green color: Munsell 5GY 5/6 (Medium green)

Anthocyanin distribution: Absent

Glossiness: Moderate

Blistering: Absent/ slight

Thickness: Intermediate

Trichomes: Absent (smooth)

Plant:

Weight: 681.8 g

Spread of frame leaves: 48.7 cm

Head diameter (market trimmed with single cap leaf):  
14.2 cm

Head shape: Spherical

Head size class: Medium

Head firmness: Firm

Butt:

Shape: Flat

Midrib: Flattened

Core:

Diameter at base of head: 32 mm

Ratio of head diameter/core diameter: 4.4

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Height from base of head to apex: 43.3 mm

Bolting:

Number of days from first water to seed stalk emergence under summer conditions: 74

Bolting class: Medium

Mature seed stalk height: 104.5 cm

Mature seed stalk spread: 36.9 cm

Bolter leaves: Straight

Margin: Entire

Bolter habit:

Terminal inflorescence: Absent

Lateral shoots: Present

Basal side shoots: Absent

Disease Resistance:

Lettuce Big-Vein Virus (LBVV): Susceptible

Lettuce Mosaic Virus (LMV) strain Ls-1: Susceptible

Powdery Mildew: Susceptible

Corky Root Rot: Susceptible

Downy Mildew (*Bremia lactucae*) (B1): Susceptible

*Verticillium* Wilt (*Verticillium dahliae*) Race 1: Resistant

Pest Resistance:

*Nasonovia ribisnigri* biotype 0 (Nr: 0): Susceptible

Stress Resistance:

Tipburn: Moderately resistant

Heat: Susceptible

Cold: Susceptible

Pink rib: Susceptible

Rusty brown discoloration: Susceptible

Internal rib necrosis: Susceptible

Comparisons to Other Lettuce Variety

Table 1 below compares characteristics of lettuce variety 'Latitude' with the lettuce variety 'Tiber' (unpatented; released as PI 635075). Column 1 lists the characteristics, column 2 shows the characteristics for lettuce variety 'Latitude', and column 3 shows the characteristics for lettuce variety 'Tiber'.  
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TABLE 1

Characteristic	'Latitude'	'Tiber'
Green color of mature leaves	Munsell 5GY 5/6	Munsell 5GY 5/8
Head diameter	14.2 cm	13.7 cm
Head weight	681.8 g	611 g
Spread of frame leaves	48.7 cm	49.8 cm
Core diameter at base of head	32 mm	30.6 mm
Core height from base of head to apex	43.3 mm	44.2 mm
10 Mature seed stalk height	104.5 cm	105.9 cm
Mature seed stalk spread	36.9 cm	36.1 cm

Table 2 below compares characteristics of lettuce variety 'Latitude' with the lettuce variety 'PS 1501' (unpatented; released as PI 673092). Column 1 lists the characteristics, column 2 shows the characteristics for lettuce variety 'Latitude', and column 3 shows the characteristics for lettuce variety 'PS 1501'.  
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TABLE 2

Characteristic	'Latitude'	'PS 1501'
Head diameter	14.2 cm	14.3 cm
Head weight	681.8 g	653.4 g
Spread of frame leaves	48.7 cm	49.5 cm
Core diameter at base of head	32 mm	31.1 mm
Core height from base of head to apex	43.3 mm	42 mm
Mature seed stalk height	104.5 cm	98.75 cm
Mature seed stalk spread	36.9 cm	34.8 cm

30 Tables 3A-3C below show results of a first trial that compares the head weight, head diameter, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'Latitude' (Table 3A) with those of 20 plants of lettuce variety 'PS 1501' (Table 3B; unpatented; released as PI 673092) and 20 plants of lettuce variety 'Tiber' (Table 3C; unpatented; released as PI 635075). The head weights shown are total head weights.  
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TABLE 3A

'Latitude'					
	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	850 g	164 mm	61 mm	35 mm	50.2 cm
Min	535 g	122 mm	47 mm	28 mm	41.6 cm
Average	686.75 g	137.2 mm	55.15 mm	31.75 mm	46.025 cm
Std. Dev.	95.14	10.30	3.30	1.92	2.46

TABLE 3B

'PS 1501'					
	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	985 g	172 mm	75 mm	34 mm	53.8 cm
Min	445 g	118 mm	42 mm	28 mm	46.5 cm
Average	740.25 g	141.95 mm	54.85 mm	31.25 mm	50.44 cm
Std. Dev.	167.01	14.51	9.40	1.77	2.11

TABLE 3C

'Tiber'				
	Head Wt.	Head Diameter	Core Length	Core Diameter
Max	770 g	155 mm	81 mm	34 mm
Min	490 g	114 mm	44 mm	26 mm
Average	619.5 g	131.55 mm	60.5 mm	30.1 mm
Std. Dev.	83.73	9.64	9.97	2.25
				56.1 cm
				47.3 cm
				50.015 cm
				2.57

Tables 4A-4C below show results of a second trial that compares the head weight, head diameter, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'Latitude' (Table 4A) with those of 20 plants of lettuce variety 'PS 1501' (Table 4B; unpatented; released as PI 673092) and 20 plants of lettuce variety 'Tiber' (Table 4C; unpatented; released as PI 635075). The head weights shown are total head weights.

TABLE 4A

'Latitude'				
	Head Wt.	Head Diameter	Core Length	Core Diameter
Max	885 g	165 mm	60 mm	40 mm
Min	510 g	130 mm	21 mm	31 mm
Average	744.75 g	144.6 mm	38.4 mm	34.95 mm
Std. Dev.	109.60	10.86	10.45	2.54
				58.2 cm
				48.5 cm
				52.31 cm
				2.74

TABLE 4B

'PS 1501'				
	Head Wt.	Head Diameter	Core Length	Core Diameter
Max	845 g	160 mm	62 mm	36 mm
Min	490 g	125 mm	18 mm	28 mm
Average	643.45 g	140.3 mm	40.65 mm	32.95 mm
Std. Dev.	114.38	10.50	11.78	2.44
				54.3 cm
				48.3 cm
				51.775 cm
				1.80

TABLE 4C

'Tiber'				
	Head Wt.	Head Diameter	Core Length	Core Diameter
Max	960 g	156 mm	73 mm	37 mm
Min	379 g	115 mm	24 mm	26 mm
Average	668.65 g	138.85 mm	38.4 mm	31.7 mm
Std. Dev.	188.48	10.99	11.84	3.15
				54.3 cm
				46.4 cm
				50.46 cm
				2.57

Tables 5A-5C below show results of a third trial that compares the head weight, head diameter, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'Latitude' (Table 5A) with those of 20 plants of lettuce variety 'PS 1501' (Table 5B; unpatented; released as PI 673092) and 20 plants of lettuce variety 'Tiber' (Table 5C; unpatented; released as PI 635075). The head weights shown are total head weights.

TABLE 5A

'Latitude'				
	Head Wt.	Head Diameter	Core Length	Core Diameter
Max	660 g	141 mm	31 mm	33 mm
Min	385 g	121 mm	23 mm	27 mm
				50.3 cm
				38.7 cm

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TABLE 5A-continued

	'Latitude'				
	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Average	507.5 g	129.6 mm	26.05 mm	30.7 mm	45.75 cm
Std. Dev.	80.94	5.55	2.31	1.53	2.72

TABLE 5B

	'PS 1501'				
	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	650 g	151 mm	31 mm	33 mm	47.5 cm
Min	415 g	124 mm	20 mm	27 mm	41.1 cm
Average	536 g	135.75 mm	23.65 mm	29.75 mm	44.93 cm
Std. Dev.	66.64	7.97	2.72	2.02	2.44

TABLE 5C

	'Tiber'				
	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	620 g	159 mm	32 mm	34 mm	53.4 cm
Min	335 g	112 mm	21 mm	27 mm	42.4 cm
Average	509 g	130.15 mm	24.85 mm	30.8 mm	48.16 cm
Std. Dev.	89.35	11.93	2.94	1.85	3.02

Tables 6A-6C below show results of a fourth trial that compares the head weight, head diameter, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'Latitude' (Table 6A) with those of 20 plants of lettuce variety 'PS 1501' (Table 6B; unpatented; released as PI 673092) and 20 plants of lettuce variety 'Tiber' (Table 6C; unpatented; released as PI 635075). The head weights shown are total head weights.

TABLE 6A

	'Latitude'				
	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	955 g	167 mm	68 mm	36 mm	55.1 cm
Min	610 g	135 mm	41 mm	27 mm	45.7 cm
Average	788 g	155.55 mm	53.6 mm	30.65 mm	50.835 cm
Std. Dev.	90.20	8.30	7.56	2.66	2.46

TABLE 6B

'PS 1501'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	960 g	174 mm	65 mm	34 mm	55.6 cm
Min	530 g	138 mm	35 mm	27 mm	48.3 cm
Average	693.75 g	154.45 mm	48.7 mm	30.55 mm	51.05 cm
Std. Dev.	123.46	9.03	7.70	2.04	2.04

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TABLE 6C

'Tiber'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	885 g	160 mm	66 mm	35 mm	53.2 cm
Min	480 g	130 mm	39 mm	26 mm	47.8 cm
Average	647 g	148.3 mm	53.05 mm	29.95 mm	50.52 cm
Std. Dev.	118.94	8.58	6.95	2.70	1.63

10 Further distinguishing features are apparent from the comparison of the variety 'Latitude' with the varieties 'PS 1501' and 'Tiber' depicted in FIGS. 2A-2Q.

#### Objective Description of the Variety 'Pacific Heart'

15 'Pacific Heart' is a romaine lettuce variety. This variety is distinct and unique to all other romaine lettuce varieties due to its resistance to *Nasonovia ribisnigri* Nr. 0 and *Fusarium* Wilt race 1, as well as characteristics including its green color, time to maturity, leaf cupping, leaf smoothness, and rib smoothness. 'Pacific Heart' has a growing season that includes spring and summer in West Coast regions of the United States as well as winter in regions in the Southwest of the United States, such the Arizona desert, and is suitable for growing in the open. FIGS. 3A-3F depict plants, hearts, and seedlings of lettuce variety 'Pacific Heart'. Lettuce variety 'Pacific Heart' is the result of numerous generations of plant selections chosen for its high degree of resistance to *Nasonovia ribisnigri* Nr. 0 and *Fusarium* Wilt race 1.

20 The variety has shown uniformity and stability for the traits, within the limits of environmental influence for the traits. It has been self-pollinated a sufficient number of generations with careful attention to uniformity of plant type. The line has been increased with continued observation for uniformity. No variant traits have been observed or are expected in variety 'Pacific Heart'.

25 Lettuce variety 'Pacific Heart' has the following morphologic and other characteristics:

Plant type: Cos (i.e., romaine)

Seed:

30 Color: Munsell 2.5Y 7/2 (White)

Light dormancy: Light required

Heat dormancy: Not susceptible

Cotyledon to Fourth Leaf Stage:

35 Shape of cotyledons: Intermediate

Shape of fourth leaf: Oval

Fourth leaf length: 18.9 mm

Fourth leaf width: 10.1 mm

Fourth leaf index (length/width×10): 18.8

Apical margin: Entire

Basal margin: Moderately dentate

Green color: Light green

Anthocyanin distribution: Absent

Cupping: Uncupped

Reflexing: Apical margins

Mature Leaves:

Margin:

Incision depth (deepest penetration of the margin):

Absent/shallow

Indentation (finest divisions of the margin): Entire

Undulation of apical margin: Absent/slight

Green color: Munsell 5GY 5/8 (Light green)

Anthocyanin distribution: Absent

Glossiness: Dull

Blistering: Moderate

Thickness: Intermediate

Trichomes: Absent (smooth)

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## Plant:

Weight: 672.7 g  
 Spread of frame leaves: 39 cm  
 Heart diameter (market trimmed): 32.6 cm  
 Heart shape: Elongate  
 Heart size class: Large  
 Heart firmness: Moderate

## Butt:

Shape: Rounded  
 Midrib: Prominently raised

## Core:

Diameter at base of head: 34.6 mm  
 Ratio of heart diameter/core diameter: 9.4  
 Height from base of heart to apex: 78.5 mm

## Bolting:

Number of days from first water to seed stalk emergence under summer conditions: 69

Bolting class: Rapid

Mature seed stalk height: 83.7 cm

Mature seed stalk spread: 31.5 cm

Bolter leaves: Curved

Margin: Dentate

Bolter habit:

Terminal inflorescence: Absent

Lateral shoots: Present

Basal side shoots: Present

## Disease Resistance:

Lettuce Big-Vein Virus (LBVV): Susceptible  
 Lettuce Mosaic Virus (LMV) strain Ls-1: Susceptible  
 Powdery Mildew: Susceptible

Corky Root Rot: Susceptible

Downy Mildew (*Bremia lactucae*) (B1): Resistant to isolates B1: 16, B1: 20, B1: 21, B1: 26, B1: 27, B1: 29, B1: 30, and B1: 33

*Fusarium* Wilt (*Fusarium oxysporum* f. sp. *lactucae*) race 1: Resistant

## Pest Resistance:

*Nasonovia ribisnigri* biotype 0 (Nr: 0): Resistant

## Stress Resistance:

Tipburn: Moderately resistant

Heat: Susceptible

Cold: Susceptible

Pink rib: Susceptible

Rusty brown discoloration: Susceptible

Internal rib necrosis: Susceptible

## Comparisons to Other Lettuce Variety

Table 7 below compares characteristics of lettuce variety 'Pacific Heart' with the lettuce variety 'Salvius' (U.S. Pat. No. 8,389,810, variety designation "41-49 RZ"). Column 1 lists the characteristics, column 2 shows the characteristics for lettuce variety 'Pacific Heart', and column 3 shows the characteristics for lettuce variety 'Salvius'.

TABLE 7

Characteristic	'Pacific Heart'	'Salvius'
Plant weight	672.7 g	705.6 g
Green color of mature leaves	Munsell 5GY 5/8	Munsell 5GY 4/6
Heart diameter	32.6 cm	33.7 cm
Core diameter	34.6 mm	35 mm
Core height at base of heart to apex	78.5 mm	58.7 mm
Mature seed stalk height	83.7 cm	91.6 cm
Mature seed stalk spread	31.5 cm	32.9 cm

Table 8 below compares characteristics of lettuce variety 'Pacific Heart' with the lettuce variety 'Vicious' (U.S. Pat.

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No. 9,913,452, variety designation "NUN 06117 LTL"). Column 1 lists the characteristics, column 2 shows the characteristics for lettuce variety 'Pacific Heart', and column 3 shows the characteristics for lettuce variety 'Vicious'.

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TABLE 8

Characteristic	'Pacific Heart'	'Vicious'
Plant weight	672.7 g	650 g
Green color of mature leaves	Munsell 5GY 5/8	Munsell 5GY 4/4
Spread of frame leaves	39 cm	39.1 cm
Heart diameter	32.6 cm	33.1 cm
Core diameter	34.6 mm	35.8 mm
Core height at base of heart to apex	78.5 mm	53.4 mm
Mature seed stalk height	83.7 cm	102.8 cm
Mature seed stalk spread	31.5 cm	45.2 cm

Tables 9A-9C below show results of a first trial that 20 compares the head weight, heart length, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'Pacific Heart' (Table 9A) with those of 20 plants of lettuce variety 'Salvius' (Table 9B; U.S. Pat. No. 8,389,810, variety designation "41-49 RZ") and 20 plants of lettuce variety 'Vicious' (Table 9C; U.S. Pat. No. 9,913,452, variety designation "NUN 06117 LTL"). The weights shown are of the whole plant (i.e., heart with the outer leaves attached), which is referred to as a head when sold (e.g., as a boxed product).

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TABLE 9A

'Pacific Heart'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	880 g	415 mm	120 mm	40 mm	43.1 cm
Min	595 g	370 mm	60 mm	34 mm	35.5 cm
Average	714.25 g	396.25 mm	94.7 mm	37.95 mm	38.505 cm
Std. Dev	85.78	12.66	15.25	1.93	2.12

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TABLE 9B

'Salvius'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	840 g	430 mm	140 mm	40 mm	42.4 cm
Min	540 g	370 mm	50 mm	32 mm	34.3 cm
Average	744.25 g	397.5 mm	84.7 mm	36.25 mm	38.5 cm
Std. Dev	77.52	18.10	24.08	2.31	2.40

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TABLE 9C

'Vicious'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	850 g	475 mm	64 mm	41 mm	40.4 cm
Min	590 g	370 mm	46 mm	30 mm	32.9 cm
Average	694.5 g	408.5 mm	56.05 mm	36.05 mm	35.695 cm
Std. Dev	79.72	23.79	5.10	3.30	2.58

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Tables 10A-10C below show results of a second trial that 60 compares the head weight, heart length, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'Pacific Heart' (Table 10A) with those of 20 plants of lettuce variety 'Salvius' (Table 10B; U.S. Pat. No. 8,389,810, variety designation "41-49 RZ") and 20 plants of lettuce variety 'Vicious' (Table 10C; U.S. Pat. No. 9,913,452, variety designation "NUN 06117 LTL"). The weights

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shown are of the whole plant (i.e., heart with the outer leaves attached), which is referred to as a head when sold (e.g., as a boxed product).

TABLE 10A

'Pacific Heart'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	1000 g	360 mm	115 mm	41 mm	38.5 cm
Min	530 g	290 mm	50 mm	32 mm	33.5 cm
Average	717.8 g	331.3 mm	75.6 mm	37.25 mm	35.73 cm
Std. Dev	97.82	20.71	17.74	3.13	1.66

TABLE 10B

'Salvius'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	1110 g	390 mm	103 mm	42 mm	40.1 cm
Min	655 g	340 mm	46 mm	30 mm	32.1 cm
Average	920.55 g	361.25 mm	75.8 mm	38.85 mm	34.645 cm
Std. Dev	131.10	14.13	14.46	2.76	2.06

TABLE 10C

'Vicious'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	805 g	390 mm	50 mm	40 mm	43.4 cm
Min	490 g	320 mm	28 mm	29 mm	34.8 cm
Average	650.25 g	355 mm	39.5 mm	35.95 mm	39.185 cm
Std. Dev	93.76	16.62	7.58	3.10	2.09

Tables 11A-11C below show results of a third trial that compares the head weight, heart length, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'Pacific Heart' (Table 11A) with those of 20 plants of lettuce variety 'Salvius' (Table 11B; U.S. Pat. No. 8,389,810, variety designation "41-49 RZ") and 20 plants of lettuce variety 'Vicious' (Table 11C; U.S. Pat. No. 9,913,452, variety designation "NUN 06117 LTL"). The weights shown are of the whole plant (i.e., heart with the outer leaves attached), which is referred to as a head when sold (e.g., as a boxed product).

TABLE 11A

'Pacific Heart'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	916 g	256 mm	82 mm	36 mm	50.2 cm
Min	350 g	215 mm	48 mm	25 mm	37.1 cm
Average	690.55 g	241.45 mm	61.95 mm	32.4 mm	44.22 cm
Std. Dev	142.09	11.18	9.76	3.15	3.58

TABLE 11B

'Salvius'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	720 g	270 mm	45 mm	40 mm	49.7 cm
Min	400 g	195 mm	24 mm	23 mm	39.4 cm
Average	581 g	243.85 mm	35.05 mm	32.65 mm	44.035 cm
Std. Dev	80.29	20.46	6.86	5.12	3.20

TABLE 11C

'Vicious'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	925 g	270 mm	65 mm	56 mm	48.1 cm
Min	550 g	194 mm	25 mm	25 mm	39.1 cm
Average	672 g	227.35 mm	42.85 mm	41.1 mm	43.765 cm
Std. Dev	97.80	21.94	13.25	8.94	2.54

10 Tables 12A-12C below show results of a fourth trial that compares the head weight, heart length, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'Pacific Heart' (Table 12A) with those of 20 plants of lettuce variety 'Salvius' (Table 12B; U.S. Pat. No. 8,389,810, variety designation "41-49 RZ") and 20 plants of lettuce variety 'Vicious' (Table 12C; U.S. Pat. No. 9,913,452, variety designation "NUN 06117 LTL"). The weights shown are of the whole plant (i.e., heart with the outer leaves attached), which is referred to as a head when sold (e.g., as a boxed product).

TABLE 12A

'Pacific Heart'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	825 g	371 mm	101 mm	36 mm	40.1 cm
Min	425 g	304 mm	64 mm	27 mm	34.2 cm
Average	568 g	333.9 mm	79.95 mm	30.9 mm	37.505 cm
Std. Dev	104.29	17.34	9.28	2.59	1.64

TABLE 12B

'Salvius'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	675 g	381 mm	45 mm	35 mm	40.4 cm
Min	445 g	321 mm	30 mm	29 mm	35.6 cm
Average	576.75 g	345.1 mm	39.25 mm	32.4 mm	38.56 cm
Std. Dev	53.10	16.23	4.48	1.64	1.45

TABLE 12C

'Vicious'	Heart Wt.	Heart Length	Core Length	Core Diameter	Frame Diameter
Max	685 g	363 mm	97 mm	33 mm	40.7 cm
Min	420 g	297 mm	58 mm	27 mm	34.8 cm
Average	583.25 g	332.55 mm	75.05 mm	29.95 mm	37.845 cm
Std. Dev	70.72	20.05	13.12	1.96	1.64

50 Further distinguishing features are apparent from the comparison of the varieties 'Pacific Heart', 'Salvius', and 'Vicious' depicted in FIGS. 4A-4V.

#### Objective Description of the Variety 'PS 1525'

55 'PS 1525' is an iceberg lettuce variety. This variety is distinct and unique to all other iceberg lettuce varieties due to its resistance to *Fusarium* Wilt race 1, as well as characteristics including its uniformity, weight, head diameter, and core diameter. 'PS 1525' has a growing season that includes summer and fall in West Coast regions of the United States as well as spring in regions in the Southwest of the United States, such as the Arizona desert, and is suitable for growing in the open. Lettuce variety 'PS 1525' is the result of numerous generations of plant selections chosen for its resistance to *Fusarium* Wilt race 1.

60 The variety has shown uniformity and stability for the traits, within the limits of environmental influence for the

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traits. It has been self-pollinated a sufficient number of generations with careful attention to uniformity of plant type. The line has been increased with continued observation for uniformity. No variant traits have been observed or are expected in variety 'PS 1525'.

Lettuce variety 'PS 1525' has the following morphologic and other characteristics:

Plant type: Crisp (i.e., iceberg)

Seed:

Color: Black (grey brown)

Light dormancy: Light not required

Heat dormancy: Susceptible

Cotyledon to Fourth Leaf Stage:

Shape of cotyledons: Spatulate

Shape of fourth leaf: Elongated

Fourth leaf length: 18.8 mm

Fourth leaf width: 9.5 mm

Fourth leaf index (length/width×10): 19.9

Apical margin: Finely dentate

Basal margin: Moderately dentate

Green color: Medium green

Anthocyanin distribution: Absent

Cupping: Slight

Reflexing: Apical margin

Mature Leaves:

Margin:

Incision depth (deepest penetration of the margin):

Moderate

Indentation (finest divisions of the margin): Crenate

Undulation of apical margin: Moderate

Green color: Munsell 5GY 5/4 (Medium green)

Anthocyanin distribution: Absent

Glossiness: Dull

Blistering: Moderate

Thickness: Intermediate

Trichomes: Absent (smooth)

Plant

Weight: 934.7 g

Spread of frame leaves: 56 cm

Head diameter (market trimmed with single cap leaf):

14.7 cm

Head shape: Spherical

Head size class: Large

Head firmness: Firm

Butt:

Shape: Rounded

Midrib: Moderately raised

Core:

Diameter at base of head: 36.5 mm

Ratio of head diameter/core diameter: 4

Height from base of head to apex: 41.2 mm

Bolting:

Number of days from first water to seed stalk emergence under summer conditions: 72

Bolting class: Medium

Mature seed stalk height: 105.3 cm

Mature seed stalk spread: 41.5 cm

Bolter leaves: Curved

Margin: Dentate

Bolter habit:

Terminal inflorescence: Present

Lateral shoots: Present

Basal side shoots: Absent

Disease Resistance:

Lettuce Big-Vein Virus (LBVV): Susceptible

Lettuce Mosaic Virus (LMV) strain Ls-1: Susceptible

Powdery Mildew: Susceptible

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Corky Root Rot: Susceptible

Downy Mildew (*Bremia lactucae*) (B1): Susceptible

*Fusarium* Wilt (*Fusarium oxysporum* f. sp. *lactucae*) race 1: Resistant

5 Pest Resistance:

*Nasonovia ribisnigri* biotype 0 (Nr: 0): Susceptible

Stress Resistance:

Tipburn: Moderately resistant

10 Heat: Susceptible

Cold: Susceptible

Pink rib: Susceptible

Rusty brown discoloration: Susceptible

15 Internal rib necrosis: Susceptible

Comparisons to Other Lettuce Variety

Table 13 below compares characteristics of lettuce variety 'PS 1525' with the lettuce variety 'Uppercut' (U.S. Patent Publication No. US 2021/0084853 A1). Column 1 lists the characteristics, column 2 shows the characteristics for lettuce variety 'PS 1525', and column 3 shows the characteristics for lettuce variety 'Uppercut'.

TABLE 13

	Characteristic	'PS 1525'	'Uppercut'
25	Weight	934.7 g	893.2 g
	Green color of mature leaves	Munsell 5GY 5/4	5GY 5/6
	Spread of frame leaves	56 cm	58.4 cm
	Head diameter	14.7 cm	14.3 cm
	Core diameter at base of head	36.5 mm	35.9 mm
	Core height from base of head to apex	41.2 mm	38.9 mm
30	Mature seed stalk height	105.3 cm	111.1 cm
	Mature seed stalk spread	41.5 cm	39.8 cm
35			

Table 14 below compares characteristics of lettuce variety

'PS 1525' with the lettuce variety 'Headmaster' (U.S. Plant Variety Protection Certificate No. 9800023). Column 1 lists the characteristics, column 2 shows the characteristics for lettuce variety 'PS 1525', and column 3 shows the characteristics for lettuce variety 'Headmaster'.

TABLE 14

	Characteristic	'PS 1525'	'Headmaster'
45	Weight	934.7 g	702.4 g
	Green color of mature leaves	Munsell 5GY 5/4	5GY 5/6
	Spread of frame leaves	56 cm	58.2 cm
	Head diameter	14.7 cm	14.2 cm
	Core diameter at base of head	36.5 mm	33.6 mm
	Core height from base of head to apex	41.2 mm	30.2 mm
50	Mature seed stalk height	105.3 cm	106.2 cm
	Mature seed stalk spread	41.5 cm	36.2 cm
55			

Tables 15A-15C below show results of a first trial that compares the head weight, head diameter, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'PS 1525' (Table 15A) with those of 20 plants of lettuce variety 'Uppercut' (Table 15B; U.S. Patent Publication No. US 2021/0084853 A1) and 20 plants of lettuce variety 'Headmaster' (Table 15C; U.S. Plant Variety Protection Certificate No. 9800023). The head weights shown are total head weights.

TABLE 15A

'PS 1525'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	1250 g	160 mm	55 mm	41 mm	53.5 cm
Min	960 g	130 mm	34 mm	30 mm	47.1 cm
Average	1060.25 g	146.75 mm	42.15 mm	36.4 mm	50.57 cm
Std. Dev.	83.88	9.06	5.10	3.45	1.61

TABLE 15B

'Uppercut'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	1110 g	151 mm	45 mm	40 mm	58.3 cm
Min	540 g	120 mm	22 mm	25 mm	50.4 cm
Average	859.5 g	136.5 mm	35.4 mm	33.1 mm	52.815 cm
Std. Dev.	152.98	7.74	5.72	3.46	2.18

TABLE 15C

'Head-master'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	890 g	156 mm	43 mm	36 mm	57.4 cm
Min	620 g	125 mm	20 mm	28 mm	50.5 cm
Average	759.75 g	139.75 mm	28.9 mm	31.8 mm	53.93 cm
Std. Dev.	74.40	7.79	4.89	2.21	2.13

Tables 16A-16C below show results of a second trial that compares the head weight, head diameter, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'PS 1525' (Table 16A) with those of 20 plants of lettuce variety 'Uppercut' (Table 16B; U.S. Patent Publication No. US 2021/0084853 A1) and 20 plants of lettuce variety 'Headmaster' (Table 16C; U.S. Plant Variety Protection Certificate No. 9800023). The head weights shown are total head weights.

TABLE 16A

'PS 1525'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	1110 g	163 mm	50 mm	41 mm	50.2 cm
Min	775 g	138 mm	29 mm	34 mm	45.1 cm
Average	955.75 g	152.3 mm	37.25 mm	36.95 mm	46.795 cm
Std. Dev.	96.92	6.33	6.09	2.56	1.30

TABLE 16B

'Uppercut'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	1140 g	164 mm	51 mm	43 mm	49.8 cm
Min	740 g	134 mm	29 mm	34 mm	44.1 cm
Average	977.5 g	149.2 mm	36.55 mm	38.15 mm	46.69 cm
Std. Dev.	89.20	8.16	5.88	2.81	1.56

TABLE 16C

'Head-master'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	1000 g	165 mm	40 mm	44 mm	49.1 cm
Min	635 g	133 mm	20 mm	29 mm	42.1 cm
Average	799.5 g	149.15 mm	30.2 mm	37.55 mm	44.99 cm
Std. Dev.	93.51	8.90	5.93	3.61	1.72

Tables 17A-17C below show results of a third trial that compares the head weight, head diameter, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'PS 1525' (Table 17A) with those of 20 plants of lettuce variety 'Uppercut' (Table 17B; U.S. Patent Publication No. US 2021/0084853 A1) and 20 plants of lettuce variety 'Headmaster' (Table 17C; U.S. Plant Variety Protection Certificate No. 9800023). The head weights shown are total head weights.

10

TABLE 17A

'PS 1525'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	1130 g	159 mm	73 mm	45 mm	56.1 cm
Min	630 g	133 mm	36 mm	31 mm	47.4 cm
Average	938.25 g	148.5 mm	57.35 mm	40.25 mm	51.565 cm
Std. Dev.	147.31	7.03	9.29	3.26	2.03

20

TABLE 17B

'Uppercut'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	1140 g	164 mm	65 mm	44 mm	59.1 cm
Min	740 g	138 mm	41 mm	32 mm	47.3 cm
Average	994.25 g	149.35 mm	52 mm	39.15 mm	52.09 cm
Std. Dev.	114.46	7.85	7.42	3.10	3.37

30

TABLE 17C

'Head-master'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	900 g	164 mm	62 mm	40 mm	57.1 cm
Min	485 g	125 mm	30 mm	32 mm	46.5 cm
Average	689.25 g	144.55 mm	40.05 mm	35.6 mm	51.195 cm
Std. Dev.	100.53	12.72	7.62	2.16	2.20

40

Tables 18A-18C below show results of a fourth trial that compares the head weight, head diameter, core length, core diameter, and frame diameter of 20 plants of the lettuce variety 'PS 1525' (Table 18A) with those of 20 plants of lettuce variety 'Uppercut' (Table 18B; U.S. Patent Publication No. US 2021/0084853 A1) and 20 plants of lettuce variety 'Headmaster' (Table 18C; U.S. Plant Variety Protection Certificate No. 9800023). The head weights shown are total head weights.

50

TABLE 18A

'PS 1525'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	997 g	159 mm	36 mm	40 mm	86 cm
Min	453 g	123 mm	20 mm	28 mm	68 cm
Average	784.35 g	139.8 mm	27.9 mm	32.3 mm	75.125 cm
Std. Dev.	129.30	11.20	4.04	2.89	4.59

60

TABLE 18B

'Uppercut'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	710 g	163 mm	45 mm	41 mm	93.5 cm
Min	420 g	111 mm	2 mm	25 mm	72 cm

65

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TABLE 18B-continued

'Upper-cut'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Average	741.5 g	137.4 mm	31.5 mm	33.35 mm	81.875 cm
Std. Dev.	121.11	13.14	10.40	3.70	7.48

TABLE 18C

'Head-master'	Head Wt.	Head Diameter	Core Length	Core Diameter	Frame Diameter
Max	865 g	148 mm	34 mm	40 mm	99 cm
Min	400 g	120 mm	10 mm	20 mm	70.5 cm
Average	561.25 g	136.25 mm	21.8 mm	29.6 mm	82.525 cm
Std. Dev.	178.10	6.71	6.68	5.21	8.59

Further distinguishing features are apparent from the comparison of the variety 'PS 1525' with the varieties 'Uppercut' and 'Headmaster' depicted in FIGS. 5A-5S.

## Further Embodiments

## Breeding

In lettuce breeding, lines are selected for their appropriate characteristics. For example, one line may be selected for bolt tolerance in the fall growing conditions of the desert production locations of California and Arizona. Another line may be selected for the size, color, and texture of the lettuce head. Crosses are made, for example, to produce a dark green, sure heading iceberg lettuce with improved texture, and size for fall plantings in Yuma, Arizona and the Salinas Valley, California.

To optimize crossing, it is important to note that lettuce is an obligate self-pollinating species. This means that the pollen is shed before stigma emergence, assuring 100% self-fertilization. Since each lettuce flower is an aggregate of about 10-20 individual florets (typical of the Compositae family), manual removal of the anther tubes containing the pollen is performed by procedures well known in the art of lettuce breeding.

The manual removal of anther tubes, though an effective means to ensure the removal of all self pollinating possibilities, is very tedious and time consuming when a large number of crosses are to be made. The breeders have therefore adapted a well documented and modified method of making crosses more efficiently using these methods. This particular cross was made by first misting the designated male flowers to wash the pollen off prior to fertilization. This process of misting is a proven and effective means of pollen removal that assures crossing or hybridization. About 60-90 minutes past sunrise, flowers to be used for crossings are selected. The basis for selection are open flowers, with the stigma emerged and the pollen visibly attached to the single stigma (about 10-20 stigma). Using 3-4 pumps of water from a regular spray bottle, the pollen is washed off with enough pressure to dislodge the pollen grains, but not enough to damage the style. Excess water is dried off with clean paper towels. About 30 minutes later, the styles should spring back up and the two lobes of the stigma are visibly open in a "V" shape. Pollen from another variety or donor parent is then introduced by gently rubbing the stigma and style of the donor parent to the maternal parent. Tags with the pertinent information on date and pedigree are then secured to the flowers in order to keep track.

About 2-3 weeks after pollination, seeds are harvested when the involucre have matured. The seeds are eventually

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sown and in the presence of markers such as leaf color or leaf margins, the selfed or maternal seedlings or plants are identified. Generally, there are no visible markers and breeders must wait until the F<sub>2</sub> generations when expected segregation patterns for the genetic character of interest can be followed. This latter situation mandates a lengthy wait to determine if hybrids are produced. Two relevant references teaching methods for out crossing lettuce are: (1) Ryder, E. J. and A. S. Johnson. 1974. Mist depollination of lettuce flowers. Hortscience 9:584; and (2) Nagata, R. T. 1992. Clip and Wash Method of Emasculation for Lettuce. Hortscience 27 (8): 907-908 both of which are hereby incorporated by reference in their entirety for the purpose of providing details on the techniques well known in the art.

## 15 Selection

In addition to crossing, selection may be used to identify and isolate new lettuce lines. In lettuce selection, lettuce seeds are planted, the plants are grown and single plant selections are made of plants with desired characteristics.

20 Such characteristics may include improved head, heart, and frame size, deeper or darker green leaf color, etc. Seed from the single plant selections are harvested, separated from seeds of the other plants in the field and re-planted. The plants from the selected seed are monitored to determine if they exhibit the desired characteristics of the originally selected line. Selection work is continued over multiple generations to increase the uniformity of the new line.

## DEPOSIT INFORMATION

## 30 Lettuce Variety 'PS 1525'

A deposit of the lettuce variety 'PS 1525' is maintained by Pinnacle Seed, Inc., having an address of P.O. Box 222672, Carmel, California 93923, United States of America. Access 35 to this deposit will be available during the pendency of this application to persons determined by the Commissioner of Patents and Trademarks to be entitled thereto under 37 C.F.R. § 1.14 and 35 U.S.C. § 122. Upon allowance of any claims in this application, all restrictions on the availability to the public of the variety will be irrevocably removed by affording access to a deposit of at least 2,500 seeds of the same variety made according to the Budapest Treaty in the American Type Culture Collection, (ATCC), ATCC Patent Depository, 10801 University Boulevard, Manassas, Virginia, 20110, USA.

40 The lettuce variety 'PS 1525' was deposited on May 3, 2024 according to the Budapest Treaty in the American Type Culture Collection (ATCC), ATCC Patent Depository, 10801 University Boulevard, Manassas, Virginia, 20110, USA. The deposit has been assigned ATCC number PTA-127758. Access to this deposit will be available during the pendency of this application to persons determined by the Commissioner of Patents and Trademarks to be entitled thereto under 37 C.F.R. § 1.14 and 35 U.S.C. § 122. Upon allowance of 45 any claims in this application, all restrictions on the availability to the public of the variety will be irrevocably removed.

50 The deposit will be maintained in the ATCC depository, which is a public depository, for a period of at least 30 years, or at least 5 years after the most recent request for a sample of the deposit, or for the effective life of the patent, whichever is longer, and will be replaced if a deposit becomes nonviable during that period.

## 55 What is claimed:

60 1. A *Lactuca sativa* seed designated as 'PS 1525', representative sample of seed having been deposited under ATCC Accession Number PTA-127758.

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2. A *Lactuca sativa* plant produced by growing the seed of claim 1.
3. A plant part from the plant of claim 2.
4. The plant part of claim 3, wherein said part is a head, a heart, a leaf, or a portion thereof.
5. The plant part of claim 4, wherein said part is a head or a heart.
6. A *Lactuca sativa* plant having all the physiological and morphological characteristics of the *Lactuca sativa* plant of claim 2.
7. A plant part from the plant of claim 6.
8. The plant part of claim 7, wherein said part is a head, a heart, a leaf, or a portion thereof.
9. The plant part of claim 8, wherein said part is a head or a heart.
10. An F<sub>1</sub> hybrid *Lactuca sativa* plant having 'PS 1525' as a parent where 'PS 1525' is grown from the seed of claim 1. 15

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11. A pollen grain or an ovule of the plant of claim 2.
12. A tissue culture of the plant of claim 2.
13. A *Lactuca sativa* plant regenerated from the tissue culture of claim 12, wherein the plant has all of the morphological and physiological characteristics of a lettuce plant produced by growing seed designated as 'PS 1525', representative sample of seed having been deposited under ATCC Accession Number PTA-127758.
14. A method of making *Lactuca sativa* seeds, said method comprising crossing the plant of claim 2 with another lettuce plant and harvesting seed therefrom.
15. A method of selecting *Lactuca sativa*, comprising:
  - a) growing more than one plant from the seed of claim 1; and
  - b) selecting a plant from step a).

\* \* \* \* \*