

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
PULLMAN, WASHINGTON

NOTICE OF RELEASE
OF OKANOGAN GERmplasm SASKATOON SERVICEBERRY
Amelanchier alnifolia (Nutt.) Nutt. ex M. Roemer from Okanogan, Washington

The Natural Resources Conservation Service, U.S. Department of Agriculture announces the release of a selected ecotype of SASKATOON SERVICEBERRY (*Amelanchier alnifolia*).

Species: *Amelanchier alnifolia*
Release Name: Okanogan Germplasm
Common Name: Saskatoon serviceberry
Plant Symbol: AMALA
Accession Numbers: 9033672, T33672

Origin: Native plants near Okanogan, Okanogan County, Washington, at 1200 feet, Major Land Resource Area B-8.

Description: Okanogan Germplasm is a deciduous shrub up to 10 feet in height and 6 feet in width. It produces numerous stems and leaves. Plants are rhizomatous and have an extensive root system with a massive root crown with horizontal and vertical rhizomes. Plants tend to be taller and grow faster than others evaluated in the planting.

Okanogan Germplasm represents five plants surviving of the six original plants.

It was selected from a Pullman Plant Materials Center study of 222 Saskatoon serviceberry accessions, 169 of which were planted in the field. The study was evaluated from 1983 - 1995. Okanogan Germplasm was rated excellent in vigor, stem and leaf abundance and average in fruit production. It was a taller plant than the planting average and other selections.

Areas of Adaptation: Saskatoon serviceberry is naturally found on slopes adjacent to riparian areas and on uplands on dry rocky slopes in precipitation zones with a minimum of 12-14 inches of mean annual precipitation. It occurs in lowlands in interior valleys to near timberline. Its native range is from southern Alaska to California; east to Alberta, the Dakotas and south to New Mexico and Arizona. It occurs with white alder, Douglas hawthorn, chokecherry, mountain ash and elderberry in riparian zones throughout its distribution area. It occurs with many other plant associations, depending on the geographic region of concern.

Anticipated Conservation Use: The primary potential use is in rehabilitation efforts in riparian areas in the Pacific Northwest. Other uses occur in reclamation projects, diversity enhancement, wildlife and shelterbelt plantings. It is an excellent plant for erosion control on streambanks and other sites with adequate moisture. It is an attractive plant for landscaping as a screen or hedge. Conservation practices that may use serviceberry plantings include Channel Vegetation, Conservation Cover, Critical Area Planting, Riparian Forest Buffer and Streambank and Shoreline Protection.

National Environmental Policy Act (NEPA): An Environmental Evaluation worksheet was completed according to the NRCS National Plant Materials Manual, Exhibit 540-31 and attached to the release documentation.

Maintenance of Okanogan Germplasm Serviceberry: The USDA Natural Resources Conservation Service, Plant Materials Center, Pullman, Washington will maintain the genetic material and make material available on a limited basis to nurseries and researchers.

Notice of Release of Okanogan Germplasm serviceberry (continued)

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**Documentation for the “Selected” Release
of
Okanogan Germplasm Serviceberry**

Scientific Name: *Amelanchier alnifolia* (Nutt.) Nutt. ex. M. Roemer

Common Name: Saskatoon serviceberry

Identification Used: 9033672, T33672

Origin: Seed was collected by Byron Fitch in July, 1982 near Okanogan, WA on a 8 – 15% south slope at 1200 feet elevation (366 m). Associated plants were rose, bitterbrush, big sagebrush, bluebunch wheatgrass and gray rabbitbrush. Major Land Resource Area (MLRA) was B-8 (Columbia Plateau). Mean annual precipitation was 12 inches (30.5 cm).

Plant Description: Okanogan Germplasm serviceberry is a native multi-stemmed, deciduous shrub with alternate branching, massive root crown, horizontal and vertical rhizomes and an extensive root system. Flowers are white racemes. Mature fruit are purplish black. Saskatoon serviceberry (*Amelanchier alnifolia*) occurs from southern Alaska to California; east to Alberta, the Dakotas and south to New Mexico and Arizona.

Mature height of Okanogan Germplasm serviceberry was 122 inches (310 cm) and mature canopy width was 71 inches (180 cm) in 11 years at Pullman, WA on an upland site with 20 inches (50.8 cm) average annual precipitation. The site also supported a mature stand of Durar hard fescue immediately adjacent to the serviceberry plants. Five year data indicated height at 59 inches (150 cm) and canopy width at 28 inches (70 cm).

Method of Development: Okanogan Germplasm was selected from among a collection of 222 accessions, 169 of which were successfully established in the field in groups of six plants per accession in 1983 and 1984. The collection was evaluated from 1983 through 1995. Selection was made in 1994 based on overall plant vigor, rate of height growth, stem abundance, foliage abundance and occurrence of the original collection site in MLRA B-8. Okanogan Germplasm is cold hardy and has no noted disease problems. This selection flowers and matures fruit earlier than other selections.

Areas of Adaptation: Serviceberry as a species is cold-hardy and is adapted to dry, rocky slopes in full sunlight or partial shade. It also occurs on moist fertile soils, forming an underbrush in aspen and lodgepole pine. It occurs from near sea level to 9000 feet elevation. It occurs in many areas down to 14 inches mean annual precipitation.

Successional Status: Saskatoon serviceberry is most vigorous in seral plant communities. It rarely establishes from seed in early stages of primary succession. It is common after disturbances such as fire, logging or insect outbreak. Serviceberry in forests is fire-dependent, where sprouting from crowns and rhizomes is the primary reproductive means. Serviceberry grows in open sun to moderate shade, but is intolerant of deep shade. It is suppressed in shade and is not normally found in closed canopy forests. It is found in the understory of mixed open forests.

Uses: Serviceberry is used in riparian, reclamation projects, diversity enhancement, wildlife, and shelterbelt plantings. It can be used as a shrub row in multiple row windbreaks. It is planted using containerized materials. Serviceberry is a valued browse plant for wildlife. It is utilized by elk, deer, black bear, beaver, hares, upland game birds, mountain goat, bighorn sheep and bison. It is also used by domestic livestock including cattle, goats and sheep.

Serviceberry is noted as having been used by Native Americans. Fruit was dried and used for winter food. It was also used in pemmican.

Propagation: Okanogan Germplasm serviceberry can easily be propagated from seed. The seed should be fall sown outside or for greenhouse planting, the seed should be cold-stratified with moisture at about 40° F for 120 to 180 days. Seed does not need scarification.

Establishment: Serviceberry can be established in the field via containerized plants. Supplemental water may be necessary, depending on site conditions. Control of competing vegetation may be necessary.

Serviceberry is recommended for rehabilitating moist sites within its range. It is well adapted to disturbed sites, stabilizes soil and is relatively easy to establish.

Initial Evaluation Performance at the Pullman PMC: Okanogan Germplasm serviceberry was noted as having good stem abundance, foliage abundance and grew faster in height than other accessions.

Wildlife Potential: Serviceberry is a valuable wildlife plant. It is utilized by elk, deer, black bear, beaver, hares, upland game birds, mountain goat, bighorn sheep and bison.

Livestock: Serviceberry is rated fair to good in palatability to cattle, goats – good, domestic sheep – fair to good and horses – poor to fair.

Poisonous Properties: There is documentation concerning poisoning of cattle, sheep and goats. Serviceberry contains cyanogenic glucosides, which are hydrolysed by rumen bacteria to free hydrogen cyanide (HCN). The cyanide blocks the action of the cellular enzyme cytochrome oxidase, thereby preventing hemoglobin from releasing oxygen to the tissues. HCN occurs in the twigs before the leaves appear and during the bloom period. The level of HCN potential is highest in new-growth twigs, especially during dry years.

Weediness: Serviceberry is not generally considered to be a weed.

Wetland Indicator: Facultative Upland (FACU): usually occurs in non-wetlands (estimated probability 67-99%), but occasionally found in wetlands (1 – 33% probability). (USFWS, Region 9 - Pacific Northwest)

Maintenance of Okanogan Germplasm (9033672) Serviceberry: The NRCS Plant Materials Center at Pullman, WA will maintain seed production blocks. Limited amounts of seed will be supplied to interested nurseries for seed production block establishment and to researchers as requested and as available.

National Environmental Policy Act (NEPA) Consideration: This material is native germplasm. It is a common plant through much of the West. Serviceberry is not considered a weed. See attached environmental evaluation.

SERVICEBERRY EVALUATIONS SUMMARY, 1983-1995

SUMMARY: Okanogan Germplasm serviceberry (9033672) compared very favorably with the initial evaluation planting averages. Means of Okanogan Germplasm for various parameters across years versus the planting means are listed in Table 1. Okanogan Germplasm stood out even though as years progressed in the evaluation, only the better accessions were evaluated in the planting. This was consistently the tallest accession in the planting. Most rated parameters including vigor, stem abundance and foliage abundance were consistently above that of the planting. Average seed(fruit) production was below that of the planting.

BACKGROUND: The majority of the collections were from native serviceberry stands in eastern Washington, eastern Oregon and north Idaho.

Breakdown for Major Land Resource Areas(MLRA) represented in the collection follows:

| <u>MLRA</u> | <u>No. Accessions</u> |
|--------------|-----------------------|
| A2 | 1 |
| B6 | 3 |
| B8 | 34 |
| B9 | 56 |
| B10 | 5 |
| B11 | 1 |
| B13 | 1 |
| D25 | 2 |
| E43 | 84 |
| E44 | 33 |
| Other | 2* |
| TOTAL | 222 |

*Source was materials from USDA Agriculture Research Service Plant Introduction Station.

The collection(fruit) was stored at 32° F and cleaned in a speed controlled blender. Seed was surface dried and stored at 40° F in cloth bags. Seed was fall sown in outside plant beds. Spring germinated plants were transferred to 10 cubic inch Ray Leach super cell cone-tainers. Plants were placed in a growth chamber to accelerate growth, then placed in a lath house on August 5. Plants were transferred in October for over-wintering to the PMC cold frame. Five accessions were field planted April 7, 1983 and the rest of the 169 accessions were planted April 16, 1984.

The collection was planted into an existing stand of Durar hard fescue which was established in 1982. The fescue had 3 foot squares spot sprayed with Glyphosate(Roundup) 5 days prior to planting. Hand weeding was used in the planting year to reduce competition. The site was an upland on Thatuna silt loam soil.

Okanogan Germplasm (9033672) was selected from the initial evaluation collection in Field Q1.

GROWTH RATES: The following chart represents growth rates in the initial evaluation planting (IEP).

Height and canopy for serviceberry

| | Heights (cm) | | | |
|-----------------------|--------------|---------|----------|----------|
| | 2 years | 5 years | 10 years | 12 years |
| Planting Means | 33.1 | 59.2 | 214.1 | 221.0 |
| 9033548 | 34.0 | 57.0 | 140.0 | 150.0 |
| 9033580 | 33.0 | 60.0 | 172.0 | 175.0 |
| Okanogan Germplasm | 45.0 | 150.0 | 295.0 | 310.0 |

| | Canopy Width (cm) | | | |
|-----------------------|-------------------|---------|----------|----------|
| | 3 years | 5 years | 10 years | 12 years |
| Planting Means | 23.3 | 32.1 | 137.9 | 147.2 |
| 9033548 | 30.0 | 30.0 | 105.0 | 125.0 |
| 9033580 | 22.0 | 35.0 | 130.0 | 130.0 |
| Okanogan Germplasm | 42.0 | 70.0 | 170.0 | 180.0 |

INITIAL EVALUATION PLANTING MEANS VS OKANOGAN GERMPLASM

(9033672) The following table summarizes some of the data from the initial evaluation planting that is not year dependent.

Table 1. Okanogan Germplasm (9033672) and planting means across years, Field Q1, Pullman PMC.

| <u>----dates----</u> | <u>Planting Means</u> | <u>Newport² Germplasm</u> | <u>Kendrick³ Germplasm</u> | <u>Okanogan Germplasm</u> |
|------------------------------------|-----------------------|--|---|-------------------------------|
| Recovery | April 16 | April 15 | April 8 | April 6 |
| Bloom | May 2 | May 11 | May 3 | April 23 |
| Fruit Mature | July 14 | July 24 | July 18 | July 15 |
| Dormant | Oct. 13 | Oct. 17 | Oct. 20 | Oct. 20 |
| Leaf Fall | Oct. 13 | Oct. 11 | Oct. 15 | Oct. 16 |
| <u>----ratings¹----</u> | | | | |
| vigor 1 | 2.6 | 1.8 | 2.1 | 1.2 |
| vigor 2 | 2.7 | 1.9 | 2.5 | 1.5 |
| stem abundance | 2.9 | 2.0 | 2.4 | 1.4 |
| foliage abundance | 2.7 | 2.0 | 1.8 | 1.3 |
| cold resistance | 1.2 | 1.5 | 1.1 | 1.1 |
| seed amount | 5.9 | 5.0 | 3.8 | 6.3 |

1 Ratings are 1-9, with 1 best

2 9033548

3 9033580

Table 2. Serviceberry yearly performance average (1982-1995) for the planting versus the selected accessions. Location: Pullman PMC, Pullman, WA. Field Q1.

| | Planting | -----Accessions----- | | |
|----------------------------------|----------|----------------------|----------------------|----------------------|
| | | 9033548 ¹ | 9033580 ² | 9033672 ³ |
| 1983 | | | | |
| No. accessions evaluated (T) | 5 | -- | -- | -- |
| Total no. field transplants | 30 | -- | -- | -- |
| No. plants survived | 20(66%) | -- | -- | -- |
| Vigor 1* | 3.4 | -- | -- | -- |
| Spring establishment height (cm) | 10.6 | -- | -- | -- |
| End of season height (cm) | 23.0 | -- | -- | -- |
| Average growth (cm) | 12.4 | -- | -- | -- |
| | | | | |
| 1984 | | | | |
| No. acc. evaluated (T) | 169 | 1 | 1 | 1 |
| No. plants survived | 910(90%) | 6 | 6 | 5 |
| Vigor 1* | 3.3 | 2 | 3 | 1 |
| Height (cm) | 23 | 26 | 31 | 25 |
| | | | | |
| 1985 | | | | |
| No. acc. evaluated (T) | 169 | 1 | 1 | 1 |
| No. plants survived | 718(71%) | 5 | 6 | 5 |
| No. plants bloomed | 0 | 0 | 0 | 0 |
| No. plants matured fruit | 0 | 0 | 0 | 0 |
| Recovery date | 04/22 | 04/22 | 04/22 | 04/22 |
| Dormant date | 10/15 | 10/17 | 10/17 | 10/17 |
| Vigor 1* | 3.4 | 4 | 3 | 1 |
| Vigor 2* | 3.8 | 3 | 4 | 1 |
| Height (cm) | 33 | 34 | 33 | 45 |
| | | | | |
| 1986 | | | | |
| No. acc. evaluated (T) | 161 | 1 | 1 | 1 |
| No. plants survived | 555(55%) | 4 | 6 | 5 |
| No. plants bloomed | 20 | 0 | 0 | 0 |
| No. plants matured fruit | 11 | 0 | 0 | 0 |
| Recovery date | 04/07 | 03/27 | 03/27 | 03/27 |
| Dormant date | 10/10 | 10/08 | 10/16 | 10/17 |
| Leaf fall date | 10/10 | 10/08 | 10/08 | 10/17 |
| Vigor 1* | 3.6 | 1 | 2 | 2 |
| Vigor 2* | 3.6 | 1 | 2 | 2 |
| Stem abundance* | 3.4 | 1 | 3 | 2 |
| Foliage abundance* | 3.4 | 1 | 2 | 2 |
| Disease resistance* | 1.6 | 2 | 2 | 2 |
| Insect resistance* | 1.0 | 1 | 1 | 1 |
| Cold resistance* | 1.0 | 1 | 1 | 1 |
| Drought resistance* | 1.9 | 2 | 3 | 2 |
| Height (cm) | 41.7 | 50 | 45 | 67 |
| Canopy cover (cm) | 23.3 | 30 | 22 | 42 |

T = total

* Ratings 1-9, with 1 best

1 Newport Germplasm

2 Kendrick Germplasm

3 Okanogan Germplasm

Table 2. continued

| | Planting | -----Accessions----- | | |
|--------------------------|----------|----------------------|---------|---------|
| | | 9033548 | 9033580 | 9033672 |
| 1987 | | | | |
| No. acc. evaluated (T) | 154 | 1 | 1 | 1 |
| No. plants survived | 455(45%) | 4 | 6 | 5 |
| No. plants bloomed | 61 | 1 | 2 | 0 |
| No. plants matured fruit | 35 | 0 | 2 | 0 |
| Fruit mature date | 07/07 | -- | -- | -- |
| Recovery date | 04/15 | 04/17 | 04/02 | 04/02 |
| Dormant date | 10/11 | 10/10 | 10/17 | 10/17 |
| Leaf fall date | 10/17 | 10/17 | 10/17 | 10/17 |
| Vigor 1* | 3.1 | 1 | 1 | 1 |
| Vigor 2* | 3.4 | 3 | 2 | 2 |
| Stem abundance* | 3.1 | 1 | 2 | 1 |
| Foliage abundance* | 3.5 | 2 | 1 | 2 |
| Disease resistance* | 1.9 | 2 | 2 | 2 |
| Insect resistance* | 1.0 | 1 | 1 | 1 |
| Cold resistance* | 1.0 | 1 | 1 | 1 |
| Drought resistance* | 3.1 | 3 | 2 | 3 |
| Height (cm) | 51.0 | 50 | 55 | 95 |
| Canopy cover (cm) | 27.4 | 30 | 35 | 50 |
| 1988 | | | | |
| No. acc. evaluated (T) | 140 | 1 | 1 | 1 |
| No. plants survived | 372(37%) | 4 | 6 | 5 |
| No. plants bloomed | 64 | 1 | 4 | 3 |
| No. plants matured fruit | 30 | 0 | 2 | 3 |
| Bloom date | 05/08 | 05/10 | 05/01 | 04/27 |
| Fruit mature date | -- | -- | -- | -- |
| Recovery date | 04/20 | 04/12 | 04/05 | 04/02 |
| Dormant date | 10/19 | 11/04 | 11/04 | 11/04 |
| Leaf fall date | 10/13 | 10/12 | 10/21 | 10/12 |
| Vigor 1* | 3.5 | 2 | 2 | 2 |
| Vigor 2* | 4.0 | 2 | 3 | 2 |
| Stem abundance* | 3.4 | 2 | 2 | 1 |
| Foliage abundance* | 3.9 | 2 | 2 | 2 |
| Disease resistance* | 1.6 | 1 | 2 | 2 |
| Insect resistance* | 1.1 | 1 | 2 | 1 |
| Cold resistance* | 1.4 | 1 | 1 | 1 |
| Drought resistance* | 3.2 | 2 | 2 | 3 |
| Seed amount* | 9.0 | 9 | 9 | 9 |
| Height (cm) | 59.2 | 57 | 60 | 150 |
| Canopy Cover (cm) | 32.1 | 30 | 35 | 70 |

T = total

* Ratings 1-9, with 1 best

Table 2. continued

| | Planting | -----Accessions----- | | |
|--------------------------|----------|----------------------|---------|---------|
| | | 9033548 | 9033580 | 9033672 |
| 1989 | | | | |
| No. acc. evaluated (T) | 130 | 1 | 1 | 1 |
| No. plants survived | 342(34%) | 4 | 6 | 5 |
| No. plants bloomed | 89 | 0 | 3 | 4 |
| No. plants matured fruit | 44 | 0 | 2 | 4 |
| Bloom date | 05/05 | -- | 05/01 | 04/24 |
| Fruit mature date | 07/10 | -- | -- | 07/11 |
| Recovery date | 04/21 | 04/24 | 04/14 | 04/10 |
| Dormant date | 10/12 | 10/16 | 10/16 | 10/16 |
| Leaf fall date | 10/11 | 10/09 | 10/16 | 10/20 |
| Vigor 1* | 3.1 | 1 | 2 | 1 |
| Vigor 2* | 3.1 | 2 | 2 | 1 |
| Stem abundance* | 3.1 | 2 | 2 | 1 |
| Foliage abundance* | 3.4 | 2 | 2 | 1 |
| Disease resistance* | 1.6 | 1 | 1 | 2 |
| Insect resistance* | 1.0 | 1 | 1 | 1 |
| Cold resistance* | 1.0 | 1 | 1 | 1 |
| Drought resistance* | 2.9 | 1 | 2 | 2 |
| Seed amount* | 6.0 | -- | -- | -- |
| Height (cm) | 69.7 | 60 | 70 | 183 |
| Canopy cover (cm) | 39.6 | 45 | 40 | 70 |
| 1990 | | | | |
| No. acc. evaluated (T) | 72 | 1 | 1 | 1 |
| No. plants survived | 301(30%) | 4 | 6 | 5 |
| No. plants bloomed | 31 | 0 | 0 | 2 |
| No. plants matured fruit | 29 | 0 | 0 | 2 |
| Bloom date | -- | -- | -- | 04/10 |
| Fruit mature date | -- | -- | -- | 07/13 |
| Vigor 1* | 1.9 | 2 | 2 | 1 |
| Vigor 2* | 2.0 | 2 | 3 | 1 |
| Stem abundance* | 2.0 | 2 | 2 | 1 |
| Foliage abundance* | 2.1 | 3 | 2 | 1 |
| Disease resistance* | 1.3 | 1 | 1 | 2 |
| Insect resistance* | 1.1 | 2 | 1 | 1 |
| Cold resistance* | 1.1 | 2 | 1 | 1 |
| Drought resistance* | 1.9 | 2 | 2 | 2 |
| Seed amount* | 7.3 | -- | -- | 9 |
| Height (cm) | 141.6 | 75 | 80 | 243 |
| Canopy cover (cm) | 77.1 | 60 | 50 | 107 |

T = total

* Ratings 1-9, with 1 best

Table 2. continued

| | Planting | -----Accessions----- | | |
|--------------------------|----------|----------------------|---------|---------|
| | | 9033548 | 9033580 | 9033672 |
| 1991 | | | | |
| No. acc. evaluated (T) | 7 | 1 | 1 | 1 |
| No. plants survived | 288(28%) | 4 | 6 | 5 |
| No. plants bloomed | 20 | 2 | 4 | 5 |
| No. plants matured fruit | 20 | 2 | 4 | 5 |
| Fruit mature date | 07/22 | 07/24 | 07/24 | 07/18 |
| Vigor 1* | 1.7 | 2 | 3 | 1 |
| Vigor 2* | 1.9 | 2 | 3 | 1 |
| Stem abundance* | 2.4 | 3 | 3 | 1 |
| Foliage abundance* | 2.3 | 3 | 2 | 1 |
| Disease resistance* | 1.3 | 1 | 2 | 1 |
| Insect resistance* | 1.3 | 2 | 1 | 1 |
| Cold resistance* | 1.7 | 2 | 2 | 1 |
| Drought resistance* | 2.0 | 2 | 2 | 1 |
| Seed amount* | 4.1 | 6 | 3 | 4 |
| Height (cm) | 172.1 | 100 | 140 | 265 |
| Canopy cover (cm) | 102.1 | 80 | 100 | 120 |
| 1992 | | | | |
| No. acc. evaluated (T) | 7 | 1 | 1 | 1 |
| No. plants survived | 271(27%) | 5 | 6 | 5 |
| No. plants bloomed | 18 | 2 | 6 | 5 |
| No. plants matured fruit | 12 | 1 | 6 | 0 |
| Recovery date | 04/08 | 04/14 | 04/01 | 04/01 |
| Bloom date | 04/14 | -- | -- | 04/14 |
| Fruit mature date | 07/16 | 07/23 | 07/18 | -- |
| Vigor 1* | 1.7 | 1 | 1 | 1 |
| Vigor 2* | 1.9 | 1 | 1 | 2 |
| Stem abundance* | 2.6 | 1 | 2 | 1 |
| Foliage abundance* | 2.1 | 1 | 1 | 1 |
| Disease resistance* | 1.0 | 1 | 1 | 1 |
| Insect resistance* | 1.3 | 1 | 1 | 1 |
| Cold resistance* | 1.7 | 1 | 1 | 1 |
| Drought resistance* | 1.9 | 2 | 1 | 2 |
| Seed amount* | 7.8 | 4 | 1 | 9 |
| Height (cm) | 199.3 | 125 | 140 | 275 |
| Canopy cover (cm) | 117.9 | 145 | 190 | 150 |

T = total

* Ratings 1-9, with 1 best

Table 2. continued.

| | Planting | -----Accessions----- | | |
|--------------------------|----------|----------------------|---------|---------|
| | | 9033548 | 9033580 | 9033672 |
| 1993 | | | | |
| No. acc. evaluated (T) | 7 | 1 | 1 | 1 |
| No. plants survived | 268(27%) | 3 | 6 | 5 |
| No. plants bloomed | 23 | 3 | 6 | 5 |
| No. plants matured fruit | 57 | 3 | 6 | 5 |
| Recovery date | 04/19 | 04/23 | 04/16 | 04/09 |
| Bloom date | 05/11 | 05/13 | 05/10 | 05/10 |
| Vigor 1* | 1.9 | 3 | 2 | 1 |
| Vigor 2* | 1.9 | 2 | 3 | 1 |
| Stem abundance* | 2.7 | 3 | 3 | 2 |
| Foliage abundance* | 2.1 | 2 | 2 | 1 |
| Disease resistance* | 1.0 | 1 | 1 | 1 |
| Insect resistance* | 1.0 | 1 | 1 | 1 |
| Cold resistance* | 1.0 | 1 | 1 | 1 |
| Drought resistance* | 1.9 | 2 | 2 | 2 |
| Seed amount* | 3.9 | 4 | 3 | 2 |
| Height (cm) | 214.1 | 140 | 172 | 295 |
| Canopy cover (cm) | 137.9 | 105 | 130 | 170 |
| 1994 | | | | |
| No. acc. evaluated (T) | 9 | 1 | 1 | 1 |
| No. plants survived | 255(25%) | 3 | 6 | 5 |
| No. plants bloomed | 30 | 3 | 6 | 5 |
| No. plants matured fruit | 30 | 3 | 6 | 5 |
| Fruit mature date | 07/06 | -- | 07/05 | 07/10 |
| Vigor 1* | 1.9 | 2 | 2 | 1 |
| Vigor 2* | 2.0 | 2 | 3 | 1 |
| Stem abundance* | 3.0 | 3 | 3 | 2 |
| Foliage abundance* | 2.2 | 2 | 2 | 1 |
| Disease resistance* | 1.6 | 2 | 2 | 1 |
| Insect resistance* | 1.0 | 1 | 1 | 1 |
| Cold resistance* | 1.0 | 1 | 1 | 1 |
| Drought resistance* | 1.8 | 1 | 1 | 1 |
| Seed amount* | 5.7 | 6 | 6 | 6 |
| Height (cm) | 205.2 | 150 | 172 | 310 |
| Canopy cover (cm) | 138.3 | 125 | 130 | 180 |
| 1995 | | | | |
| No. acc. evaluated (T) | 9 | 1 | 1 | 1 |
| No. plants survived | 254(25%) | 3 | 6 | 5 |
| No. plants bloomed | 33 | 3 | 6 | 5 |
| No. plants matured fruit | 33 | 3 | 6 | 5 |
| Fruit mature date | 07/25 | 07/25 | 07/25 | 07/25 |
| Vigor 1* | 1.9 | 1 | 2 | 1 |
| Vigor 2* | 1.9 | 2 | 1 | 2 |
| Stem abundance* | 2.8 | 2 | 2 | 2 |
| Foliage abundance* | 2.2 | 2 | 2 | 1 |
| Disease resistance* | 1.2 | 1 | 1 | 1 |
| Insect resistance* | 1.0 | 1 | 1 | 1 |
| Cold resistance* | 1.0 | 1 | 1 | 1 |
| Drought resistance* | 1.2 | 1 | 1 | 1 |
| Seed amount* | 4.7 | 1 | 1 | 5 |
| Height (cm) | 221.1 | 150 | 175 | 310 |
| Canopy cover (cm) | 147.2 | 125 | 130 | 180 |

T = total

*Ratings 1-9, with 1 best

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