‘NuMex Camino’ Onion

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The New Mexico State Univ. Agricultural Experiment Station announces the release of ‘NuMex Camino’ onion (*Allium cepa* L.). ‘NuMex Camino’ is an open-pollinated, early-maturing, single-centered, bolting-resistant, pink-root-resistant, firm, round globe, short-day, yellow-skin onion cultivar for fall seeding in southern New Mexico and similar environments. ‘NuMex Camino’ matures in mid-May when fall seeded in Las Cruces, N.M.

Origin

‘NuMex Camino’ originates from a cross made in 1980 between ‘Excel 986B’ and a pink-root- and bolting-resistant selection of ‘Texas Early Grano 502’ (‘TEG 502 PRR BR’) (Fig. 1). ‘Excel 986B’ is a selection from ‘Yellow Bermuda’ (Goldman and Havey, 1998), is an early-maturing, short-day, yellow, flat Bermuda onion. ‘NuMex Camino’ possesses normal (N) cytoplasm inherited from the maternal parent, ‘Excel 986B’. ‘Texas Grano 502 PRR BR’ is a pink root (*Phoma terrestris*)- and bolting-resistant selection from ‘Texas Grano 502’ (Corgan,

1984). ‘Texas Grano 502’ was selected from ‘New Mexico Early Grano’ that originated from lines introduced from Spain labeled as ‘Valencia Grano’ (Corgan, 1984; Garcia and Fite, 1931). ‘Texas Early Grano 502 PRR BR’ is a short-day, yellow selection onion that matures between 20 May to 1 June when fall-planted in southern New Mexico. ‘Texas Early Grano 502’ is grano-shaped and produces large bulbs that are low in pungency and soluble solids, have soft flesh and few dry scales, and store for short periods of time (Hawthorn, 1944). ‘Texas Early Grano 502 PRR BR’ has sterile (S) cytoplasm (Havey and Bark, 1994).

The cross was made in a common pollination cage using honeybees as the pollen vector. Seed was collected from the ‘Excel 986B’ parent population only and planted. The following year, two separate selections were made using phenotypic evaluation at field maturity from fall seeding near Las Cruces, N.M. For each selection, yellow bulbs that possessed early bulb maturity, uniform maturity, pink root resistance, bolting resistance, uniform round globe bulb shape, hard bulb firmness, light bronze to bronze scale color, multiple scale layers, and thin scale were selected. The selections were made from fields that contained high inoculum levels of *Phoma terrestris* (Hansen) and *Fusarium oxysporum* f. sp. *cepae* [(H.N. Hans.) W.C. Snyder & H.N. Hans]. At bulb maturity, bulbs were rated for incidence of pink root. Only bulbs that possessed a healthy root

system with minimal symptoms of pink root were selected. At bulb maturity, bulbs possessing *Fusarium* basal rot were not selected. During storage, bulbs that developed *Fusarium* basal rot were discarded. Selection for bolting resistance was done in field plantings that possessed 70% or more plants with scapes at harvest time. Seed was planted about 1 Sept. to promote scape formation. This date is three to four weeks earlier than the earliest recommended planting date for fall-planted onions in southern New Mexico.

Selection for bulb shape was for a round, globe shape, and for a bulb that was rounder and deeper than a typical flat Bermuda shape. Selection for bulb shape uniformity was for bulbs of the same size possessing the same desired shape. Selection for bulb scale color was based on the color of the dry outer bulb scales. Selection for bulb shape and color was based on subjective visual observation. Selection for bulb firmness was based on a subjective evaluation of the amount of bulb scale resistance when a force was applied to the bulb. Selection for bulb maturity was based on a desired harvest date of the second week of May.

In 1982, selected bulbs were intercrossed with two separate bolting and pink root resistant selections of ‘Texas Early Grano 502’. Seed was collected from each parent population, kept separate from each other, and planted as separate lines. The following year, selections were made within each line using the forementioned selection criteria and were kept separate. In 1984, selected bulbs from the four breeding lines were intercrossed with ‘Texas Grano 1015Y’. ‘Texas Grano 1015Y’ (TG1015Y) was developed from a single bulb selection from ‘Texas Early Grano 951’ (Pike et al., 1988). TG1015Y is a short-day, top-shaped, yellow grano cultivar with good pink-root resistance.

Seed was collected from each parent population, kept separate from each other, and planted

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Fig. 1. Pedigree of ‘NuMex Camino’.

as separate lines. In 1985, 1987, 1989, and 1991, selections were made within each line using the fore-mentioned selection criteria and were kept separate. After each selection, bulbs from each line were kept separate and were intercrossed in a crossing cage. Seed was collected from each parent population, kept separate from each other, and planted as separate lines. In 1992, selections made from the breeding line originally derived from 'Texas Grano 1015Y' were excluded from the crossing cage and not perpetuated further. Seed was collected from each remaining parent population, kept separate from each other, and planted as separate lines. In 1993, selections were made within each line using the fore-mentioned selection criteria. Selections made from the two breeding lines that originated from the 'Excel 986B' and 'TEG 502 PRR BR' cross were massed together as a single breeding line. Selections from other breeding lines were kept separate. In 1994, seed was collected from each parent population, kept separate from each other, and planted as separate lines. In 1995, selections were made within each line; however, only selections from the breeding line derived from the 'Excel 986B' and 'TEG 502 PRR BR' cross were kept and placed in the crossing cage. Seed was collected the following year and planted. In 1997, 1999, and 2001, selections were made and each year's selections were intercrossed to form the next generation. In addition to the selection criteria mentioned previously, bulbs that possessed a single growing point when cut transversely at the vertical center of the bulb were selected.

Description and performance

'NuMex Camino' is an open-pollinated, early-maturing, short-day, round globe onion that matures from 9 to 15 May when fall-seeded in Las Cruces, N.M. (Table 1). Suggested planting dates at Las Cruces are 15–20 Sept. 'NuMex Camino' matures earlier from fall seeding than other cultivars commonly grown in New Mexico. It has excellent bolting resistance and will tolerate early seeding dates. 'NuMex Camino' exhibits pink root resistance comparable to later maturing cultivars. It has a marketable bulb yield, an average bulb size, and a percentage of single centered bulbs comparable to later maturing yellow cultivars. 'NuMex Camino' produces round globe bulbs that possess good firmness and multiple light bronze dry outer scale layers.

Replicated field trials were conducted in 1999–2000, 2000–2001, and 2001–2002 comparing 'NuMex Camino' to 'NuMex Chaco' (Cramer and Corgan, 2001), 'NuMex Mesa', and 'NuMex Sweetpak' (Wall and Corgan, 1999) (Table 1). In each year, 'NuMex Camino' matured 6 to 10 d earlier than the other yellow

Table 1. Bulb maturity, scape production, marketable yield, average bulb weight, and percentage of single centers of 'NuMex Camino' as compared to 'NuMex Chaco', 'NuMex Mesa', and 'NuMex Sweetpak' when grown on soil moderately infested with pink root and *Fusarium* basal rot pathogens at the Fabian Garcia Research Center, Las Cruces, N.M., from 1999 to 2002.

Entry	Maturity date ^z	Scapes (%) ^y	Marketable yield (t-ha ⁻¹) ^x	Avg bulb wt (g) ^w	Single centers (%) ^v
<i>1999–2000 (20 Sept. 1999 seeding date)</i>					
NuMex Camino	11 May	0.0	68.6	363	69.0
NuMex Chaco	17 May	0.5	71.8	392	85.0
NuMex Mesa	17 May	1.5	83.8	443	57.0
NuMex Sweetpak	17 May	18.6	67.8	514	58.0
Mean	15 May	5.1	73.0	428	67.3
LSD _{0.05}	1 d***	5.2***	NS	NS	10.6***
<i>2000–2001 (14 Sept. 2000 seeding date)</i>					
NuMex Camino	15 May	0.0	68.4	383	64.0
NuMex Chaco	22 May	0.0	83.4	437	68.0
NuMex Mesa	22 May	0.5	85.2	451	39.0
NuMex Sweetpak	19 May	12.3	76.3	485	42.0
Mean	19 May	19.1	78.3	440	53.3
LSD _{0.05}	3 d***	3.0***	8.5**	45**	11.1***
<i>2001–2002 (18 Sept. 2001 seeding date)</i>					
NuMex Camino	9 May	0.0	56.4	335	68.5
NuMex Chaco	19 May	1.0	56.9	372	80.0
NuMex Mesa	15 May	1.5	64.0	323	51.0
NuMex Sweetpak	15 May	13.1	54.3	369	64.0
Mean	15 May	3.9	58.0	349	65.9
LSD _{0.05}	5 d*	1.8***	NS	NS	15.9*

^zA plot was considered mature when 80% of the tops were down and was harvested at that time.

^yThe percentage of scapes was determined at harvest and calculated by dividing the number of plants with scapes by the total number of plants per plot and multiplying by 100.

^xMarketable bulb yield (t-ha⁻¹) was calculated by weighing the marketable bulbs per plot and adjusting the plot size to 1 ha.

^wAverage bulb weight was calculated by dividing the marketable bulb weight by the number of marketable bulbs.

^vThe percentage of bulbs with single centers (single growing points) was determined by cutting each bulb transversely at the vertical center and measuring the number of growing points that extended 1.3 cm beyond the bulb's center.

NS, *, **, ***Nonsignificant at $P = 0.05$, significant at $P = 0.05$, 0.01, and 0.001, respectively. Test was conducted at $\alpha = 0.05$.

cultivars tested. 'NuMex Camino' produced fewer seedstalks than 'NuMex Sweetpak' and had bolting resistance comparable to 'NuMex Chaco' and 'NuMex Mesa'. In 2 years of testing, 'NuMex Camino' produced a marketable bulb yield comparable to the other cultivars tested. In the 2000–2001 test year, 'NuMex Camino' produced smaller bulbs than the other cultivars and this difference in bulb size resulted in lower bulb yield when compared to other tested cultivars. The smaller bulb size could be attributed to earlier maturity of 'NuMex Camino' as compared to the other cultivars. In each year, 'NuMex Camino' produced a higher percentage of single-centered bulbs than 'NuMex Mesa'. For the past 2 years, 'NuMex Camino' produced a percentage of single-centered bulbs comparable to 'NuMex Chaco', a cultivar known for producing a high percentage of single-centered bulbs.

Availability

Currently, 'NuMex Camino' is being produced, marketed, and sold exclusively by

Lockhart Seeds of Stockton, Calif. Application for Plant Variety Protection will be filed.

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