

2000-2001 Fall-planted Onion Cultivar Trials at New Mexico State University

Christopher S. Cramer and Jose L. Mendoza

Department of Agronomy and Horticulture, New Mexico State University, Las Cruces, NM 88003-0003

Materials and Methods

- Eleven entries were placed in the early maturing group (table 1); six entries were placed in the intermediate-maturing group (table 3); and four entries were placed in the late-maturing group (table 5).
- Seeded Sept. 14, 2000. Thinned on Oct. 27, 2000 to 4 in. (10 cm) between plants.
- Plots were 8 ft long.
- RCBD within maturity group. 4 replications per entry.
- Standard cultural practices used.
- All four replications of a particular entry were harvested when all of the plots exhibited 80% of the plants with their tops down.
- Traits measured: bulb maturity date, number of seedstalks, pink root incidence, Fusarium basal rot (FBR) incidence, number of bulbs per plot, weight of bulbs per plot, number of marketable bulbs, weight of marketable bulbs, number of bulbs with single growing points.
- Percentage of seedstalks: Number of seedstalks divided by number of plants.
- Pink root rating: 25 bulbs rated on 1 (no infected roots) to 9 (all infected roots) scale.
- Percentage of Fusarium basal rot: Basal plate cut for each bulb. Presence or absence of disease recorded. Expressed as percentage of total bulbs.
- Percentage of marketable yield: Marketable bulb weight divided by total bulb weight.
- Marketable yield: Weight of marketable bulbs per plot converted to per hectare.
- Average bulb weight: Marketable bulb weight divided by marketable bulb number.
- Percentage of single centers: Bulbs cut transversely at vertical center. Single growing point or multiple growing points within 2 cm from center of bulb considered single center.
- Means per entry and all entries within each maturity group. Trait differences between entries using ANOVA. Fisher's least significant difference (LSD) mean separation test at 5% level.

Results

Early maturing entries (Table 1)

- Approximate bulb maturity ranged from 11 May 2001 to 29 May 2001.
- Seedstalks varied among entries tested. The percentage was generally low (3.7%) for all entries.
- Pink root rating generally was low (2.6) for most entries.
- The Fusarium basal rot (FBR) severity was generally low among all entries.
- The percentage of marketable bulbs was variable among entries.
- Bulb size was generally large.
- The percentage of single centered bulbs was generally low.

Intermediate maturing entries (Table 3)

- Bulb maturity ranged from May 29 to June 5, 2001.
- The bolting incidence was generally low (3.1%).
- The percentage of bulbs with pink root was generally high (82.3%) among entries while pink root severity was generally low (2.4)
- The Fusarium basal rot (FBR) incidence and severity was generally low among entries except for 'Cardinal' (table 3).
- The percentage of marketable bulbs was generally high (91%) and not different among entries.
- Yield and bulb size were excellent for all entries except 'Cardinal'.
- The percentage of single centered bulbs was generally low for all entries.

Late maturing entries (Table 5)

- Entries matured on June 16, 2001.
- Seedstalk production was generally low (5.0%) among the entries with 'NuMex Luna' producing the greatest percentage.
- The pink root and FBR severity and incidence was low.
- The percentage of marketable bulbs was generally high.
- High marketable bulb yield.
- The percentage of single centered bulbs was generally low.

Table 1. Bulb maturity, seedstalk production, and disease evaluation of fall-seeded, early maturing entries in 2000-2001 onion trial at Fabian Garcia Research Center in Las Cruces, N.M.

| Entry ^a | Seed source | Harvest date ^b | Maturity date ^c | Seedstalks (%) ^d | Pink root ^e | Pink root (%) ^f | Fusarium ^g | Fusarium (%) ^h |
|--------------------|-------------|---------------------------|----------------------------|-----------------------------|------------------------|----------------------------|-----------------------|---------------------------|
| Daybreak | Shamrock | May 30 | May 27 | 4.5 | 2.3 | 89.0 | 2.2 | 42.0 |
| Bus | Shamrock | May 30 | May 29 | 0.5 | 2.4 | 79.0 | 2.9 | 52.0 |
| NMSU 00-13-1 | NMSU | May 16 | May 15 | 0.0 | 2.3 | 98.0 | 1.4 | 25.0 |
| NMSU 99-16 | NMSU | May 22 | May 22 | 0.0 | 2.2 | 91.0 | 1.3 | 23.0 |
| NMSU 99-28 | NMSU | May 30 | May 29 | 0.0 | 2.3 | 83.0 | 2.4 | 61.0 |
| NMSU 99-91 | NMSU | May 16 | May 11 | 3.0 | 2.2 | 93.0 | 1.5 | 32.0 |
| NuMex Chaco | NMSU | May 22 | May 22 | 0.0 | 2.3 | 98.0 | 1.6 | 34.0 |
| NuMex Mesa | NMSU | May 22 | May 22 | 0.5 | 2.3 | 95.0 | 1.3 | 19.0 |
| NuMex Sweetpak | NMSU | May 22 | May 19 | 12.3 | 2.3 | 90.0 | 1.8 | 38.0 |
| Texas Early White | Seminis | May 22 | May 22 | 19.6 | 2.1 | 91.0 | 1.5 | 27.0 |
| NIZ 3700 | Vilmorin | May 16 | May 15 | 0.0 | 5.5 | 100.0 | 5.0 | 98.0 |
| Mean | | May 21 | 3.7 | 2.6 | 91.5 | 2.1 | 41.0 | |
| LSD (5%) | | 2 ^{***} | 5.5 ^{***} | 0.3 ^{**} | NS | 0.6 [*] | 15.4 | |

NS, **Nonsignificant, significant at $P = 0.001$, respectively.

^aAll entries have yellow skin, except NMSU 99-28, NMSU 99-91, and 'Texas Early White', which have white skin.

^bAn entry was harvested when all four replications had 80% of their tops down within the plot.

^cA plot was considered matured when 80% of the tops were down.

^dThe percentage of seedstalks was determined at harvest and calculated by dividing the number of plants with seedstalks by the total number of plants per plot.

^ePink root rating. Root system of bulbs were rated based on a scale of 1 (no infected roots) to 9 (completely infected roots).

^fPercentage of bulbs with pink root.

^gFusarium basal plates rot rating. Cut basal plates were rated based on a scale of 1 (no disease tissue) to 9 (70% or more of basal plate decayed).

^hPercentage of bulbs with Fusarium basal plate rot (FBR). Each bulb's basal plate was cut transversely to reveal the presence or absence of FBR.



Texas Early White



NuMex Mesa



NuMex Chaco



NuMex Sweetpak



NMSU 00-13-1



NMSU 99-16

Table 3. Bulb maturity, seedstalk production, and disease evaluation of fall-seeded, intermediate maturing entries in 2000-2001 onion trial at Fabian Garcia Research Center in Las Cruces, N.M.

| Entry ^a | Seed source | Harvest date ^b | Maturity date ^c | Seedstalks (%) ^d | Pink root ^e | Pink root (%) ^f | Fusarium ^g | Fusarium (%) ^h |
|--------------------|-------------|---------------------------|----------------------------|-----------------------------|------------------------|----------------------------|-----------------------|---------------------------|
| Cardinal | Shamrock | May 30 | May 29 | 0.0 | 3.9 | 100.0 | 5.6 | 75.0 |
| NMSU 98-20 | NMSU | June 7 | June 4 | 0.5 | 1.8 | 69.0 | 2.1 | 44.0 |
| NuMex Crispy | NMSU | May 30 | May 29 | 6.1 | 1.8 | 56.0 | 2.4 | 62.0 |
| NuMex Dulce | NMSU | June 7 | June 4 | 11.1 | 2.5 | 96.0 | 1.6 | 24.0 |
| NuMex Starlite | NMSU | June 7 | June 4 | 0.0 | 2.2 | 80.0 | 1.5 | 25.0 |
| NuMex Vado | NMSU | June 7 | June 5 | 1.1 | 2.4 | 93.0 | 2.0 | 35.0 |
| Mean | | June 2 | 3.1 | 2.4 | 82.3 | 2.5 | 44.2 | |
| LSD (5%) | | 3 ^{***} | 2.9 ^{***} | 0.4 ^{***} | 15.3 ^{***} | 0.6 ^{**} | 28.2 ^{**} | |

NS, **Nonsignificant at $P = 0.01$, significant at $P = 0.001$, respectively.

^aAll entries have yellow skin, except NMSU 98-20 and 'NuMex Crispy', which have white skin, and 'Cardinal', which has red skin.

^bAn entry was harvested when all four replications had 80% of their tops down within the plot.

^cA plot was considered matured when 80% of the tops were down.

^dThe percentage of seedstalks was determined at harvest and calculated by dividing the number of plants with seedstalks by the total number of plants per plot.

^ePink root rating. Root system of bulbs were rated based on a scale of 1 (no infected roots) to 9 (completely infected roots).

^fPercentage of bulbs with pink root.

^gFusarium basal plates rot rating. Cut basal plates were rated based on a scale of 1 (no disease tissue) to 9 (70% or more of basal plate decayed).

^hPercentage of bulbs with Fusarium basal plate rot (FBR). The basal plate of each bulb was cut transversely to reveal the presence or absence of FBR.



NuMex Starlite



NuMex Crispy



NuMex Dulce

Table 5. Bulb maturity, seedstalk production, and disease evaluation of fall-seeded, late maturing entries in 2000-2001 onion trial at Fabian Garcia Research Center in Las Cruces, N.M.

| Entry ^a | Seedstalks (%) ^b | Pink root ^c | Pink root (%) ^d | Fusarium ^e | Fusarium (%) ^f |
|--------------------|-----------------------------|------------------------|----------------------------|-----------------------|---------------------------|
| NMSU 99-24 | 6.2 | 1.7 | 56.0 | 2.2 | 31.0 |
| NuMex Freedom | 0.5 | 1.6 | 46.0 | 1.7 | 25.0 |
| NuMex Luna | 12.1 | 2.0 | 70.0 | 2.3 | 36.0 |
| NuMex Solano | 1.1 | 1.8 | 63.0 | 1.7 | 26.0 |
| Mean | 5.0 | 1.8 | 58.8 | 2.0 | 29.5 |
| LSD (5%) | 4.9 ^{**} | NS | NS | NS | NS |

NS, **Nonsignificant, significant at $P = 0.01$, respectively.

^aAll entries have yellow skin, except 'NuMex Solano', which has white skin. All entries originated from New Mexico State University. All entries were harvested on June 16, 2001 and had the same maturity date. An entry was harvested when all four replications had 80% of their tops down within the plot. A plot was considered matured when 80% of the tops were down.

^bThe percentage of seedstalks was determined at harvest and calculated by dividing the number of plants with seedstalks by the total number of plants per plot.

^cPink root rating. Root system of bulbs were rated based on a scale of 1 (no infected roots) to 9 (completely infected roots).

^dPercentage of bulbs with pink root.

^eFusarium basal plates rot rating. Cut basal plates were rated based on a scale of 1 (no disease tissue) to 9 (70% or more of basal plate decayed).

^fPercentage of bulbs with Fusarium basal plate rot (FBR). The basal plate of each bulb was cut transversely to reveal the presence or absence of FBR.



NuMex Freedom



NMU 99-24



NuMex Solano

Recommendations

- NMSU 00-13-1, NMSU 99-16, 'NuMex Chaco', and 'NuMex Mesa' for late May harvest of yellow onions.
- With a later planting, 'NuMex Sweetpak' for late May harvest of sweet onions and 'Texas Early White' for late May harvest of white onions.
- 'NuMex Starlite' for harvest of sweet yellow onions and 'NuMex Crispy' for harvest of white onions during early June.
- NMSU 99-24 and 'NuMex Freedom' for harvest of sweet yellow onions and 'NuMex Solano' for harvest of white onions during mid to late June.

Acknowledgements

We would like to thank Jim Fowler and the farm staff at the Fabian Garcia Research Center for their assistance with these trials. Finally, we would like to thank the students who worked to plant, thin, weed, harvest, and grade the trials.

