**POTATO (*Solanum tuberosum***
**'Atlantic', 'Dark Red Norland',**
**'Russet Burbank', 'Snowden')**
**Seedpiece Treatment Evaluation**

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**EVALUATION OF POTATO SEEDPIECE TREATMENTS - HANCOCK, 1999:** Cut seedpieces of Atlantic, Dark Red Norland, Russet Burbank and Snowden potatoes were planted at the Hancock Agricultural Research Station to evaluate the effect of chemical and cultural treatments on seedpiece decay, emergence, stand, and yield. All seedpieces were cut mechanically with most treatments cut the day of planting. To apply chemical seedpiece treatments, seedpieces (40 lb - Dark Red Norland; 45 lb - Atlantic, Russet Burbank, Snowden) were placed in plastic bags with the chemical and shaken until seedpieces were uniformly coated with chemical. The "Early Trial" containing the majority of the treatments was planted April 21. To compare the effect of weather conditions at planting and during emergence, an additional set of two treatments for each cultivar (fresh cut or healed 5 days) were planted on April 28 (Late Trial). All seedpieces were planted with an assist-feed planter approximately 3 inches deep. Conditions at planting April 21 were: Air temperature 59°F, soil temperature 63°F at the depth of seedpiece placement, seedpiece temperature 57°F and relative humidity 62%, high thin clouds completely covered the sky and the soil was moderately moist. Conditions on April 28 were: Air temperature 60°F, soil temperature 59°F at the depth of seedpiece placement, seedpiece temperature 57°F, relative humidity was 46% and skies were clear. The experiment was designed as a randomized complete block with four replications. Each plot consisted of 50 feet of row with seedpieces planted 12 inches apart in the row and treatment rows were spaced three feet apart. Soil type was a Plainfield loamy sand with pH 6.3. Fertilizer consisted of 250 lb/A of 0-0-60 (broadcast April 6 as a preplant application), 500 lb/A of 6-24-24 (applied in the row at planting), sidedress applications on May 19 (21-0-0, 350 lb/A) and June 10 (34-0-0, 375 lb/A) and broadcast application June 3 of Cal-Sul, 400 lb/A. Insects were controlled with Admire (16 oz./A) incorporated in the fertilizer at planting and foliar application of Dimethoate 400 (1 pt/A, June 25), Monitor 4 (1 qt/A, July 2) and Provado 1.6 F (4 oz./A, August 20 and 27). Linex 4 L (1.0 pt/A) was applied May 11 for weed control. Fungicide was applied on a standard schedule for early and late blight control (Bravo Zn 1.13 pt/A - June 18, July 2, July 16; 1.5 pt/A - July 29; 2.13 pt/A - August 20, September 10; Quadris 2.08F, 6.2 fl oz./A - June 25, July 9, July 23, August 13; 12.4 fl oz./A - September 3; Curzate, 3.3 oz./A + Bravo Zn, 2.13 pt/A August 27). Vines were killed with applications of Diquat, 1.0 pt/A, plus Peptoil, 1.0 qt/A (Dark Red Norland and Atlantic on August 16; Russet Burbank and Snowden on September 8). Rainfall measured during the growing season (inches) was 0.9 (April 21-30); 3.3 - May; 3.7 - June; 10.7 - July; 4.5 - August and 0.5 - September (through the 20$^{th}$). An additional 7.6 inches of water was applied as overhead sprinkler irrigation in 16 applications (June 10 - August 17).

Emergence was counted for each plot seven times between May 25 and June 15 for all treatments and an additional time on June 22 for the later planted trial. Height measurements were taken for all plants in the trial on May 28 and June 7, and for only the later planted treatments on June 22. To evaluate seedpiece decay, disease development and general plant vigor, 10 hills per plot were evaluated (June 16 for the earlier planted trial and June 25 for the later planted trial). The 10 hills from each plot were dug by hand and the number of stems per plant, Rhizoctonia severity, incidence of black leg symptoms and extent of seedpiece decay were recorded. Seedpieces from plants which were dug and evaluated were removed and discarded. Total fresh weight of all leaves and stems, and weight of daughter tubers was recorded for the sample of plants dug from each plot. These values were expressed as grams (fresh weight) per hill. Plant height was expressed in two different ways: height per plant is the sum of all plant heights, divided by the actual number of plants which emerged; height per hill is the sum of heights measured, divided by 50, the number of hills planted. Height per hill thus represents a measure of general vigor of all plants in a plot, since this value would be very low if few plants emerged. A forty-foot section of row in each plot was mechanically harvested (Dark Red Norland and Atlantic on August 27; Russet Burbank and Snowden on September 14) and graded into US#1, undersize, and cull categories. Specific gravity was measured on a sample of tubers from each plot of the Russet Burbank and Snowden treatments. US#1 tubers from all plots were sorted using an optical size grader into six categories: <4 oz., 4-6 oz., 6-10 oz., 10-13 oz., 13-16 oz., and >16 oz.

Cool weather conditions during late April and mid May appeared to delay emergence and prolong the emergence period. Soil temperatures were relatively stable and rainfall was sufficient, but not excessive. The

cultivars used in this trial required approximately 10 days more in 1999 for emergence than observed in 1998. Regionally there were more stand losses associated with seedpiece decay and Rhizoctonia canker in 1999 than in the previous five years. It is likely that the prolonged emergence period contributed to these losses. Observations in our field trials are listed below by cultivar.

**Atlantic (Tables 1-4)**

The use of seedpieces cut and healed for 5 days before planting significantly improved emergence of the plots planted on April 21 when compared with the planting of fresh cut seedpieces. This effect was still evident, although the differences were less, in the plots planted on April 28. The average number of days required to reach full emergence was similar for plots planted with either fresh cut or healed seedpieces. Plots planted on April 21 required an average of 8.6 days longer to achieve full emergence when compared with plots planted on April 28, due in part to the warmer soil conditions in late April. The severity of seedpiece decay was significantly higher on fresh cut versus healed seedpieces at the June 25 field evaluation. The planting date, however, had no effect on seedpiece decay severity. While not significant at the 0.05 level, more Rhizoctonia stem canker was observed in plots planted with healed versus fresh cut seedpieces. For the April 21 planting, stem numbers were slightly higher in plots planted with healed seedpieces compared with plots planted with fresh cut seed. Stem numbers were similar in the April 28 planting regardless of whether the planting material was healed or fresh cut. Although not significant in all cases, plant fresh weight and the weight of daughter tubers tended to be higher on June 25 in plots planted with healed seedpieces. For those plots planted on April 21 and for pooled data from both planting dates, total yield and yield of US#1A tubers were significantly higher in plots planted with healed versus fresh cut seedpieces. Differences were smaller and not significant at $P = 0.05$ for plots planted on April 28. Significant differences in size grades were not observed between fresh cut versus healed seedpiece treatments and the two planting dates. Healing seedpieces before planting significantly improved the crop value per acre compared with using fresh cut seed for the April 21 planting and pooled data for both planting dates. Significant differences in crop values between the two planting dates were not observed for pooled data.

**Dark Red Norland (Tables 5-8)**

Healing seedpieces before planting on both planting dates significantly improved emergence. The number of days to full emergence did not differ significantly between the two planting dates. Likewise the average plant height was similar for both seedpiece treatments and planting dates. The severity of seedpiece decay was greatest for plots planted with fresh cut seed on both planting dates. The severity of blackleg and Rhizoctonia stem canker were unaffected by treatment. For the April 21 planting, stem numbers were significantly higher in plots planted with healed seedpieces than in plots planted with fresh cut seed. For those plots planted on April 28, stem numbers were similar regardless of planting healed or fresh cut seedpieces. For data pooled across both planting dates, the plant fresh weight on June 25 was greatest in plots planted with healed seedpieces. For data pooled across seedpiece treatments, the plant fresh weight was highest for plots planted on April 28. Yields for both planting dates and seedpiece treatments were low. However the total yield and yield of US#1 tubers were highest in plots where seedpieces were healed for 5 days before planting on April 28. The size distribution of harvested tubers was similar for all treatments and planting dates. Crop values were highest for plots planted with healed versus fresh cut seedpieces and those planted on April 28 versus April 21.

**Russet Burbank (Tables 9-12)**

Most chemical treatments applied to freshly cut seedpieces prior to planting improved plant emergence when compared with no chemical treatment. Emergence in plots planted with healed, but untreated seedpieces was similar to emergence in plots planted with chemically treated fresh cut seed. The number of days for maximum emergence was similar for healed versus fresh cut seedpieces and for the April 21 versus April 28 planting dates. Plant height on June 25 was not affected by seedpiece treatment. The least amount of seedpiece decay was observed in plots planted with healed seedpieces on April 21. Many of the chemical treatments applied to freshly cut seed and planted on April 21 increased the amount of seedpiece decay on the June 25 evaluation. Blackleg incidence and severity were low throughout the trial. The severity of

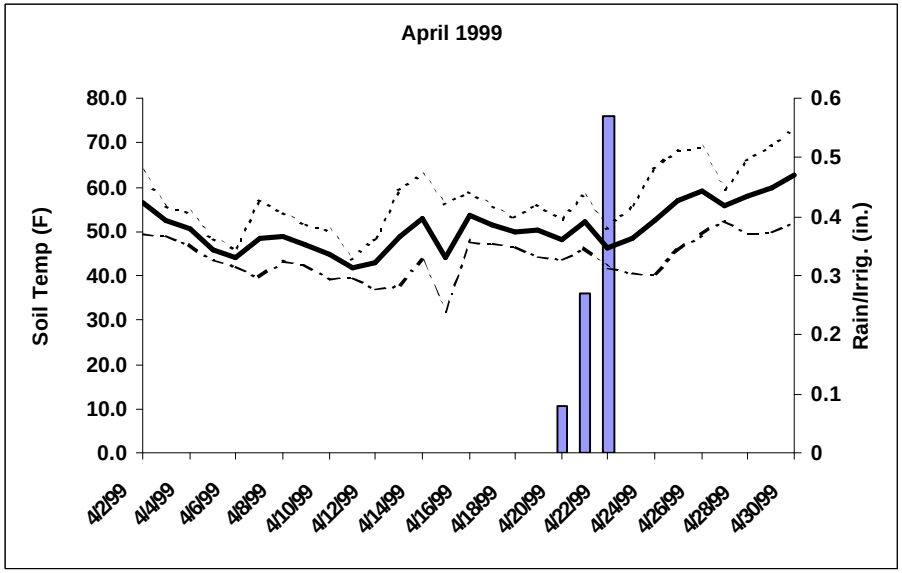
Rhizoctonia stem canker was highest in plots receiving no fungicide application to the seedpieces. Stem numbers tended to be similar between treatments with the exception of the LS295 treatment that reduced emergence and stem numbers. Prevalence of early dying in this plot contributed to low yields. Compared with the untreated fresh cut seed plots, yields were improved with the application of most chemical treatments. The addition of AuxiGro to the Tops-MZ treatment appeared to improve total yield and yield of culls, but not yields of US#1A tubers. Seed treatments did not affect the size distribution of harvested tubers. Crop values were highest for plots planted with untreated seedpieces healed for 5 days before planting and lowest for plots planted with fresh cut seedpieces treated with LS295.

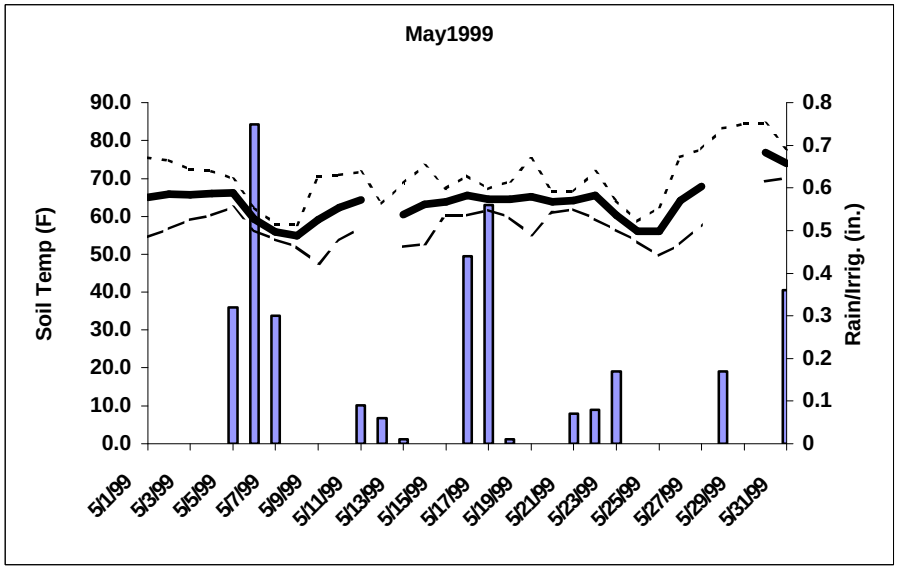
**Snowden (Tables 13-16)**

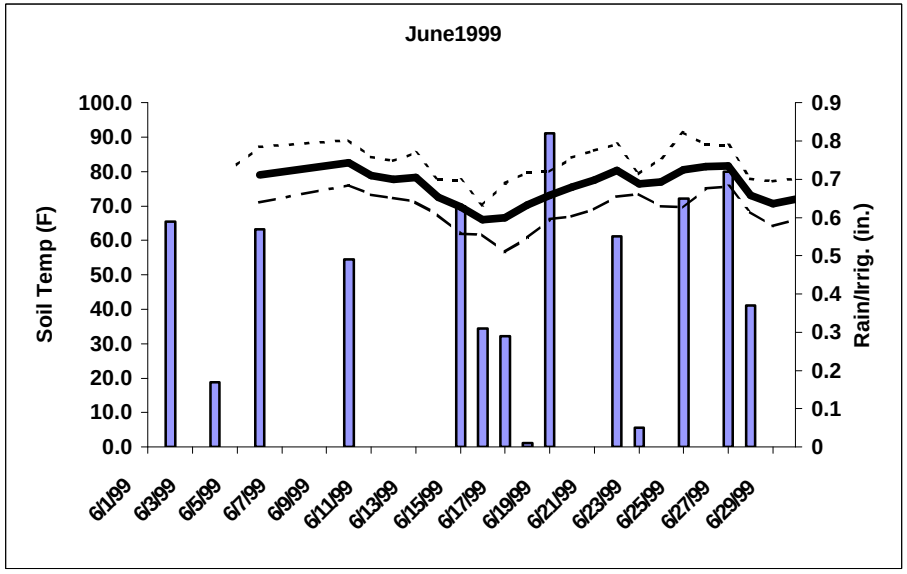
Healing seedpieces planted on April 21 for five days before planting significantly improved plant emergence compared with plots planted with fresh cut seed. For plots planted a week later on April 28 (warmer soil), differences were not observed in the performance of fresh cut or healed seedpieces. For pooled data, six additional days were needed for maximum emergence for the early planting date versus the late planting date. The severity of seedpiece decay was high for all plots. Healing the seedpieces before planting reduced seedpiece decay and the incidence and severity of blackleg. This was most evident for plots planted on April 21. The severity of Rhizoctonia stem canker was highest in plots planted on April 28 and unaffected by planting either healed or fresh cut seed. For the early planting date, healed seed produced a higher number of stems, a higher fresh weight of foliage and a higher fresh weight of daughter tubers than fresh cut seed. No differences in stem numbers were observed for the late planting date. For pooled data across both planting dates, yields were unaffected by using either fresh cut or healed seedpieces. Yields in plots planted on April 21, however, were significantly higher than in plots planted on April 28. The size distribution of tubers was unaffected by planting date or seed treatment. An evaluation of treatment values showed an advantage of using healed seed for the early planting and fresh cut seed for the late planting.

**Figure 1. Soil Temperature and Rainfall/Irrigation - Hancock Agricultural Research Station, 1999**

Rain/Irrigation (inches) | Average soil temperature (°F) | Dotted lines represent minimum-maximum soil temperature each day | Planting dates: April 21 (early trial), April 28 (late trial)



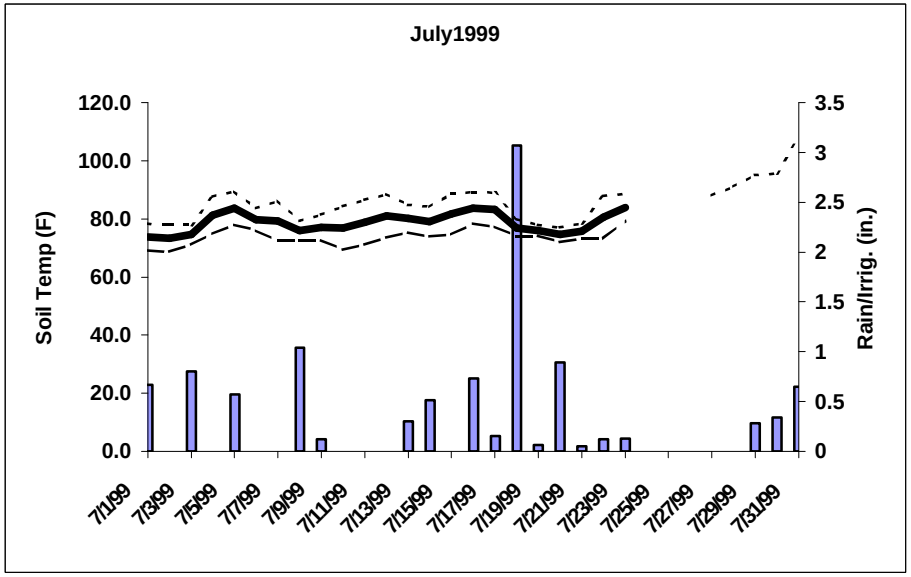



*Table 1. Effect of potato seedpiece treatment on field emergence, stand and height of Atlantic potatoes.*

| Treatment and rate per cwt | Percentage of plants emerged on: [1] | | | | | | | Avg. days to emergence [2] | Avg. height (cm) [3] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Per plant | | | Per hill | | |
| | 5/25 | 5/28 | 6/1 | 6/7 | 6/11 | 6/15 | 6/22 | | 5/28 | 6/7 | 6/22 | 5/28 | 6/7 | 6/22 |
| **Earlier Planted Trial (4/21/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 75.0 | 75.0 | 77.5 | 73.5 | 76.5 | 80.0 | --- | 38.5 | 8.3 | 19.8 | --- | 6.4 | 14.6 | --- |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 51.5 | 50.5 | 50.5 | 52.0 | 52.5 | 50.0 | --- | 40.2 | 8.6 | 18.7 | --- | 4.4 | 9.5 | --- |
| **Pr > F** [4] | 0.03 | 0.05 | 0.02 | 0.03 | 0.03 | <0.01 | --- | 0.44 | 0.70 | 0.42 | --- | 0.05 | 0.05 | --- |
| **LSD** (*P* = 0.05) [4] | 19.7 | 23.6 | 18.8 | 17.7 | 20.0 | 8.2 | --- | NS | NS | NS | --- | 2.0 | 5.1 | --- |
| **Later Planted Trial (4/28/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 57.5 | 61.0 | 65.5 | 69.5 | 70.5 | 73.0 | 76.0 | 31.0 | 4.5 | 15.2 | 37.1 | 2.7 | 10.6 | 28.3 |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 62.5 | 64.0 | 65.5 | 63.0 | 65.0 | 63.5 | 63.0 | 30.7 | 4.8 | 15.2 | 36.3 | 3.0 | 9.5 | 22.9 |
| **Pr > F** [4] | 0.53 | 0.77 | 1.00 | 0.32 | 0.44 | 0.10 | 0.03 | 0.74 | 0.37 | 1.00 | 0.72 | 0.49 | 0.49 | 0.11 |
| **LSD** (*P* = 0.05) [4] | NS | NS | NS | NS | NS | 13.1* | 10.9 | NS | NS | NS | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | | | | | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | | | | | | | | |
| Healed 5 days | 66.3 | 68.0 | 71.5 | 71.5 | 73.5 | 76.5 | --- | 34.7 | 6.4 | 17.5 | --- | 4.5 | 12.6 | --- |
| Fresh cut | 57.0 | 57.3 | 58.0 | 57.5 | 58.8 | 56.8 | --- | 35.4 | 6.7 | 16.9 | --- | 3.7 | 9.5 | --- |
| **Pr > F** [4] | 0.06 | 0.07 | 0.01 | <0.01 | <0.01 | <0.01 | --- | 0.43 | 0.67 | 0.67 | --- | 0.25 | 0.02 | --- |
| **LSD** (*P* = 0.05) [4] | 9.6* | 11.8* | 8.8 | 8.0 | 8.5 | 4.5 | --- | NS | NS | NS | --- | NS | 2.5 | --- |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | | | | | | | | |
| Earlier planting date | 63.3 | 62.8 | 64.0 | 62.8 | 64.5 | 65.0 | --- | 39.4 | 8.5 | 19.2 | --- | 5.4 | 12.0 | --- |
| Later planting date | 60.0 | 62.5 | 65.5 | 66.3 | 67.8 | 68.3 | --- | 30.8 | 4.6 | 15.2 | --- | 2.9 | 10.1 | --- |
| **Pr > F** [4] | 0.46 | 0.96 | 0.71 | 0.35 | 0.41 | 0.14 | --- | <0.01 | < 0.01 | 0.01 | --- | < 0.01 | 0.10 | --- |
| **LSD** (*P* = 0.05) [4] | NS | NS | NS | NS | NS | NS | --- | 1.9 | 1.6 | 3.0 | --- | 1.5 | 2.5* | --- |
| Interaction between healing and planting | | | | | | | | | | | | | | |
| **Pr > F** [4] | 0.01 | 0.03 | 0.01 | 0.06 | 0.04 | <0.01 | --- | 0.30 | 1.0 | 0.7 | --- | 0.1 | 0.1 | --- |

1. Based on 50 seedpieces planted/50 feet of row. A sample from each plot in the early planted trial was dug and rated for disease on June 16 so emergence was not recorded for the early trial on June 22.
2. The average number of days to emergence was calculated for all plants which did come up.
3. Avg. height per plant includes only those plants which grew. To calculate avg. height per hill, a height of 0 is included in the average for hills where no plant grew.
4. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 2. Effect of potato seedpiece treatment on decay, black leg and Rhizoctonia symptoms and plant development on Atlantic potatoes.*

| Treatment and rate per cwt | Evaluation of 10 hills per replication [1] | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | Avg. fresh weight (g) | |
| | % decay [2] | % of plants with black leg | Black leg severity | % Rhizoctonia infection [3] | No. of stems per plant | Leaves + stems per hill | Daughter tubers per hill |
| **Earlier Planted Trial (4/21/99)** | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | |
| No chemical treatment, healed 5 days | 19.8 | 10.0 | 4.9 | 28.5 | 2.5 | 463.8 | 45.3 |
| **Fresh cut - cut and treated day of planting** | | | | | | | |
| No chemical treatment | 54.2 | 2.5 | 3.6 | 8.2 | 1.7 | 344.2 | 21.9 |
| **Pr > F** [4] | 0.11 | 0.44 | 0.84 | 0.28 | 0.02 | 0.10 | 0.27 |
| **LSD** (*P* = 0.05) [4] | NS | NS | NS | NS | 0.5 | 161.8* | NS |
| **Later Planted Trial (4/28/99)** | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | |
| No chemical treatment, healed 5 days | 7.7 | 0.0 | 0.0 | 9.8 | 2.5 | 784.7 | 179.3 |
| **Fresh cut - cut and treated day of planting** | | | | | | | |
| No chemical treatment | 65.6 | 2.5 | 1.6 | 10.5 | 2.2 | 577.8 | 160.0 |
| **Pr > F** [4] | 0.01 | 0.39 | 0.39 | 0.81 | 0.74 | 0.18 | 0.67 |
| **LSD** (*P* = 0.05) [4] | 31.5 | NS | NS | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | |
| Healed 5 days | 13.8 | 5.0 | 2.5 | 19.1 | 2.5 | 624.3 | 112.3 |
| Fresh cut | 59.9 | 2.5 | 2.6 | 9.3 | 1.9 | 461.0 | 91.0 |
| **Pr > F** [4] | 0.00 | 0.58 | 0.98 | 0.21 | 0.19 | 0.03 | 0.29 |
| **LSD** (*P* = 0.05) [4] | 18.4 | NS | NS | NS | NS | 139.5 | NS |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | |
| Earlier planting date | 37.0 | 6.3 | 4.3 | 18.3 | 2.1 | 404.0 | 33.6 |
| Later planting date | 36.7 | 1.3 | 0.8 | 10.1 | 2.3 | 681.3 | 169.7 |
| **Pr > F** [4] | 0.97 | 0.28 | 0.29 | 0.29 | 0.54 | < 0.01 | < 0.01 |
| **LSD** (*P* = 0.05) [4] | NS | NS | NS | NS | NS | 139.5 | 42.9 |
| Interaction between healing and planting | | | | | | | |
| **Pr > F** [4] | 0.18 | 0.28 | 0.64 | 0.18 | 0.58 | 0.50 | 0.91 |

1 Plants in the earlier planted trial were evaluated on June 16. The later planted trial was evaluated June 25.

2 Severity of seedpiece decay rated on a Horsfall-Barratt scale of 0 (no decay) to 11 (100% decay). Ratings were converted to percentages.

3 Severity rated on a Horsfall-Barratt scale of 0 (no infection) to 11 (death of all stems due to Rhizoctonia infection). Ratings were converted to percentages.

4 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 3. Effect of seedpiece treatment on yield, proportion of US#1, undersize and culls and size grades of Atlantic potatoes.*

| Treatment and rate per cwt | Total yield cwt/A | US#1 | | Undersize[1] | | Culls | | Size grades of US#1 potatoes | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | cwt/A | % | cwt/A | % | cwt/A | % | % < 4 oz. | % 4-6 oz. | % 6-10 oz. | % 10-13 oz. | % 6-13 oz. | % 13-16 oz. | % > 16 oz. |
| **Earlier Planted Trial (4/21/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 308.0 | 236.8 | 76.7 | 9.9 | 3.2 | 61.3 | 20.1 | 12.7 | 21.4 | 33.8 | 13.4 | 47.3 | 7.6 | 11.0 |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 227.8 | 159.9 | 69.1 | 5.2 | 2.3 | 62.7 | 28.6 | 15.4 | 17.0 | 29.0 | 16.8 | 45.8 | 9.9 | 11.9 |
| **Pr > F** [2] | 0.01 | < 0.01 | 0.01 | 0.25 | 0.48 | 0.80 | 0.02 | 0.14 | 0.29 | 0.40 | 0.45 | 0.49 | 0.04 | 0.65 |
| **LSD** (*P* = 0.05) [2] | 34.5 | 26.6 | 3.2 | NS | NS | NS | 5.8 | NS | NS | NS | NS | NS | 2.2 | NS |
| **Later Planted Trial (4/28/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 336.7 | 227.0 | 66.8 | 12.9 | 3.9 | 96.9 | 29.3 | 13.1 | 22.6 | 34.4 | 10.6 | 45.1 | 8.7 | 10.5 |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 296.5 | 211.6 | 70.4 | 7.1 | 2.4 | 77.7 | 27.2 | 15.4 | 19.2 | 35.7 | 13.6 | 49.4 | 6.1 | 9.9 |
| **Pr > F** [2] | 0.39 | 0.78 | 0.69 | 0.01 | 0.07 | 0.30 | 0.81 | 0.21 | 0.38 | 0.81 | 0.04 | 0.37 | 0.17 | 0.93 |
| **LSD** (*P* = 0.05) [2] | NS | NS | NS | 3.5 | 1.8* | NS | NS | NS | NS | NS | 2.6 | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | | | | | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | | | | | | | | |
| Healed 5 days | 322.4 | 231.9 | 71.7 | 11.4 | 3.6 | 79.1 | 24.7 | 12.9 | 22.0 | 34.1 | 12.0 | 46.2 | 8.1 | 10.8 |
| Fresh cut | 262.1 | 185.8 | 69.8 | 6.2 | 2.3 | 70.2 | 27.9 | 15.4 | 18.1 | 32.4 | 15.2 | 47.6 | 8.0 | 10.9 |
| **Pr > F** [2] | 0.01 | 0.09 | 0.72 | 0.01 | 0.07 | 0.50 | 0.54 | 0.14 | 0.12 | 0.55 | 0.14 | 0.56 | 0.89 | 0.97 |
| **LSD** (*P* = 0.05) [2] | 39.6 | 55.0 | NS | 3.7 | 1.4 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | | | | | | | | |
| Earlier planting date | 267.9 | 198.4 | 72.9 | 7.6 | 2.7 | 62.0 | 24.3 | 14.0 | 19.2 | 31.4 | 15.1 | 46.5 | 8.8 | 11.5 |
| Later planting date | 316.6 | 219.3 | 68.6 | 10.0 | 3.2 | 87.3 | 28.2 | 14.3 | 20.9 | 35.1 | 12.1 | 47.2 | 7.4 | 10.2 |
| **Pr > F** [2] | 0.02 | 0.41 | 0.43 | 0.17 | 0.51 | 0.08 | 0.46 | 0.88 | 0.48 | 0.23 | 0.16 | 0.77 | 0.15 | 0.75 |
| **LSD** (*P* = 0.05) [2] | 39.6 | NS | NS | NS | NS | 28.7 | NS | NS | NS | NS | NS | NS | NS | NS |
| Interaction between healing and planting | | | | | | | | | | | | | | |
| **Pr > F** [2] | 0.28 | 0.24 | 0.30 | 0.75 | 0.65 | 0.44 | 0.31 | 0.91 | 0.84 | 0.31 | 0.92 | 0.25 | 0.02 | 0.85 |

1 Undersize is defined as potatoes less than 1 7/8 inches in diameter.

2 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 4. Effect of experimental treatment on value per acre of Atlantic tubers.*

| Treatment and rate per cwt | Gross value of yield [1] | | Effect of treatment on value [2] | |
|---|---|---|---|---|
| | Fresh market [3] | Chipping [4] | Fresh market [3] | Chipping [4] |
| **Earlier Planted Trial (4/21/99)** | | | | |
| **Seedpieces cut and healed before planting** | | | | |
| No chemical treatment, healed 5 days | $1089 | $1278 | $333 | $377 |
| **Seedpieces fresh cut - cut and treated day of planting** | | | | |
| No chemical treatment | 756 | 901 | 0 | 0 |
| **Pr > F** [5] | 0.01 | < 0.01 | < 0.01 | < 0.01 |
| **LSD** (*P* = 0.05) [5] | 151 | 88 | 151 | 88 |
| **Later Planted Trial (4/28/99)** | | | | |
| **Seedpieces cut and healed before planting** | | | | |
| No chemical treatment, healed 5 days | 1108 | 1251 | 104 | 957 |
| **Seedpieces fresh cut - cut and treated day of planting** | | | | |
| No chemical treatment | 1004 | 1163 | 0 | 0 |
| **Pr > F** [5] | 0.65 | 0.74 | 0.65 | 0.74 |
| **LSD** (*P* = 0.05) [5] | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | |
| Healed 5 days | 1099 | 1265 | 218 | 233 |
| Fresh cut | 880 | 1032 | 0 | 0 |
| **Pr > F** [5] | 0.05 | 0.07 | 0.06 | 0.08 |
| **LSD** (*P* = 0.05) [5] | 217 | 253* | 230* | 264* |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | |
| Earlier planting date | 922 | 1090 | 166 | 189 |
| Later planting date | 1056 | 1207 | 52 | 44 |
| **Pr > F** [5] | 0.20 | 0.32 | 0.29 | 0.25 |
| **LSD** (*P* = 0.05) [5] | NS | NS | NS | NS |
| Interaction between healing and planting | | | | |
| **Pr > F** [5] | 0.26 | 0.23 | 0.29 | 0.25 |

1 Cost of seedpiece treatment chemicals were not included in calculations for this trial.
2 Gross value of untreated control (fresh cut, no chemical applied) minus gross value for the treatment.
3 Typical 1999 fresh market pricing: 4-6 oz. $8.50/cwt, 6-10 oz. $10.50/cwt, 10-13 oz. $11.50, >13 oz. $12.00, < 4 oz. and culls $1.75/cwt.
4 Typical 1999 chipping price of $4.75/cwt for a size range of 1 7/8 to 4" (estimated to be all US#1 potatoes from our size grading except those > 16 oz.) Process grade for chip stock (undersize + culls + >16 oz.) = $1.75/cwt.
5 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 5. Effect of potato seedpiece treatment on field emergence, stand and height of Dark Red Norland potatoes.*

| Treatment and rate per cwt | Percentage of plants emerged on: [1] | | | | | | | Avg. days to emergence [2] | Avg. height (cm) [3] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Per plant | | | Per hill | | |
| | 5/25 | 5/28 | 6/1 | 6/7 | 6/11 | 6/15 | 6/22 | | 5/28 | 6/7 | 6/22 | 5/28 | 6/7 | 6/22 |
| **Earlier Planted Trial (4/21/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 68.5 | 70.0 | 71.5 | 71.0 | 72.0 | 73.5 | --- | 36.3 | 9.4 | 22.3 | --- | 6.9 | 16.0 | --- |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 38.5 | 38.0 | 39.0 | 38.5 | 39.0 | 39.0 | --- | 38.8 | 7.1 | 19.5 | --- | 2.7 | 7.4 | --- |
| **Pr > F** [4] | 0.03 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | --- | 0.18 | 0.24 | 0.17 | --- | 0.06 | 0.01 | --- |
| **LSD** (*P* = 0.05) [4] | 25.9 | 27.7 | 20.4 | 17.1 | 19.0 | 19.9 | --- | NS | NS | NS | --- | 4.4* | 4.5 | --- |
| **Later Planted Trial (4/28/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 54.0 | 60.0 | 65.5 | 70.0 | 74.5 | 73.5 | 76.0 | 31.2 | 4.6 | 15.8 | 41.2 | 2.9 | 11.1 | 31.4 |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 51.5 | 53.0 | 55.5 | 56.0 | 59.5 | 56.5 | 55.5 | 32.4 | 4.3 | 16.0 | 42.1 | 2.4 | 8.8 | 23.4 |
| **Pr > F** [4] | 0.80 | 0.48 | 0.33 | 0.19 | 0.17 | 0.12 | 0.06 | 0.49 | 0.80 | 0.93 | 0.50 | 0.64 | 0.22 | 0.08 |
| **LSD** (*P* = 0.05) [4] | NS | NS | NS | NS | NS | NS | 21.8* | NS | NS | NS | NS | NS | NS | 9.8* |
| ***Analysis of the effect of healing and planting time*** | | | | | | | | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | | | | | | | | |
| Healed 5 days | 61.3 | 65.0 | 68.5 | 70.5 | 73.3 | 73.5 | --- | 33.7 | 7.0 | 19.0 | --- | 4.9 | 13.6 | --- |
| Fresh cut | 45.0 | 45.5 | 47.3 | 47.3 | 49.3 | 47.8 | --- | 35.6 | 5.7 | 17.8 | --- | 2.5 | 8.1 | --- |
| **Pr > F** [4] | 0.06 | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 | --- | 0.19 | 0.22 | 0.25 | --- | 0.05 | < 0.01 | --- |
| **LSD** (*P* = 0.05) [4] | 16.7* | 17.0 | 15.5 | 17.4 | 16.7 | 16.5 | --- | NS | NS | NS | --- | 2.4 | 3.2 | --- |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | | | | | | | | |
| Earlier planting date | 53.5 | 54.0 | 55.3 | 54.8 | 55.5 | 56.3 | --- | 37.5 | 8.2 | 20.9 | --- | 4.8 | 11.7 | --- |
| Later planting date | 52.8 | 56.5 | 60.5 | 63.0 | 67.0 | 65.0 | --- | 31.8 | 4.5 | 15.9 | --- | 2.6 | 10.0 | --- |
| **Pr > F** [4] | 0.92 | 0.75 | 0.46 | 0.31 | 0.15 | 0.26 | --- | <0.01 | < 0.01 | < 0.01 | --- | 0.0664 | 0.2570 | --- |
| **LSD** (*P* = 0.05) [4] | NS | NS | NS | NS | NS | NS | --- | 2.9 | 2.2 | 2.4 | --- | 2.4* | NS | --- |
| Interaction between healing and planting | | | | | | | | | | | | | | |
| **Pr > F** [4] | 0.10 | 0.13 | 0.13 | 0.26 | 0.26 | 0.26 | --- | 0.66 | 0.33 | 0.19 | --- | 0.12 | 0.05 | --- |

1. Based on 50 seedpieces planted/50 feet of row. A sample from each plot in the early planted trial was dug and rated for disease on June 16 so emergence was not recorded for the early trial on June 22.
2. The average number of days to emergence was calculated for all plants which did come up.
3. Avg. height per plant includes only those plants which grew. To calculate avg. height per hill, a height of 0 is included in the average for hills where no plant grew.
4. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 6. Effect of potato seedpiece treatment on decay, black leg and Rhizoctonia symptoms and plant development on Dark Red Norland potatoes.*

| Treatment and rate per cwt | Evaluation of 10 hills per replication [1] | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | Avg. fresh weight (g) | |
| | % decay [2] | % of plants with black leg | Black leg severity | % Rhizoctonia infection [3] | No. of stems per plant | Leaves + stems) per hill | Daughter tubers per hill |
| **Earlier Planted Trial (4/21/99)** | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | |
| No chemical treatment, healed 5 days | 59.2 | 2.5 | 0.7 | 9.5 | 4.4 | 484.8 | 83.6 |
| **Fresh cut - cut and treated day of planting** | | | | | | | |
| No chemical treatment | 80.4 | 5.0 | 6.6 | 4.2 | 2.1 | 225.7 | 21.0 |
| **Pr > F** [4] | 0.09 | 0.39 | 0.29 | 0.39 | 0.03 | 0.16 | 0.07 |
| **LSD** (*P* = 0.05) [4] | 27.0* | NS | NS | NS | 2.0 | NS | 71.5* |
| **Later Planted Trial (4/28/99)** | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | |
| No chemical treatment, healed 5 days | 60.7 | 2.5 | 1.3 | 9.1 | 3.9 | 720.1 | 190.0 |
| **Fresh cut - cut and treated day of planting** | | | | | | | |
| No chemical treatment | 91.1 | 2.5 | 2.4 | 3.1 | 4.0 | 569.8 | 227.4 |
| **Pr > F** [4] | 0.02 | 1.00 | 0.75 | 0.20 | 0.95 | 0.05 | 0.28 |
| **LSD** (*P* = 0.05) [4] | 21.3 | NS | NS | NS | NS | 154.5 | NS |
| ***Analysis of the effect of healing and planting time*** | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | |
| Healed 5 days | 60.0 | 2.5 | 1.0 | 9.3 | 4.2 | 602.4 | 136.8 |
| Fresh cut | 85.8 | 3.8 | 4.5 | 3.6 | 3.0 | 397.8 | 124.2 |
| **Pr > F** [4] | 0.01 | 0.65 | 0.29 | 0.26 | 0.02 | 0.01 | 0.49 |
| **LSD** (*P* = 0.05) [4] | 16.3 | NS | NS | NS | 0.9 | 151.8 | NS |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | |
| Earlier planting date | 69.8 | 3.8 | 3.6 | 6.9 | 3.2 | 355.2 | 52.3 |
| Later planting date | 75.9 | 2.5 | 1.9 | 6.1 | 3.9 | 645.0 | 208.7 |
| **Pr > F** [4] | 0.42 | 0.65 | 0.58 | 0.87 | 0.12 | 0.00 | <.01 |
| **LSD** (*P* = 0.05) [4] | NS | NS | NS | NS | NS | 151.8 | 39.5 |
| Interaction between healing and planting | | | | | | | |
| **Pr > F** [4] | 0.54 | 0.65 | 0.45 | 0.94 | 0.02 | 0.44 | 0.02 |

1 Plants in the earlier planted trial were evaluated on June 16. The later planted trial was evaluated June 25.

2 Severity of seedpiece decay rated on a Horsfall-Barratt scale of 0 (no decay) to 11 (100% decay). Ratings were converted to percentages.

3 Severity rated on a Horsfall-Barratt scale of 0 (no infection) to 11 (death of all stems due to Rhizoctonia infection). Ratings were converted to percentages.

4 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 7. Effect of seedpiece treatment on yield, proportion of US#1, undersize and culls and size grades of Dark Red Norland potatoes.*

| Treatment and rate per cwt | Total yield cwt/A | US#1 | | Undersize[1] | | Culls | | Size grades of US#1 potatoes | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | cwt/A | % | cwt/A | % | cwt/A | % | % < 4 oz. | % 4-6 oz. | % 6-10 oz. | % 10-13 oz. | % 6-13 oz. | % 13-16 oz. | % > 16 oz. |
| **Earlier Planted Trial (4/21/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 271.2 | 186.4 | 67.4 | 19.0 | 7.2 | 65.8 | 25.5 | 26.8 | 30.9 | 36.0 | 4.4 | 40.5 | 0.9 | 0.9 |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 152.3 | 108.4 | 66.1 | 9.2 | 6.7 | 34.7 | 27.2 | 26.1 | 32.5 | 27.7 | 9.2 | 36.9 | 4.5 | 0.0 |
| **Pr > F** [2] | 0.00 | 0.01 | 0.82 | 0.05 | 0.35 | 0.27 | 0.74 | 0.84 | 0.65 | 0.19 | 0.04 | 0.53 | 0.05 | 0.39 |
| **LSD** (*P* = 0.05) [2] | 47.7 | 38.6 | NS | 9.5 | NS | NS | NS | NS | NS | NS | 4.6 | NS | 3.7 | NS |
| **Later Planted Trial (4/28/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 304.9 | 208.4 | 68.5 | 14.8 | 4.9 | 81.7 | 26.6 | 24.0 | 29.1 | 31.3 | 10.6 | 42.0 | 3.7 | 1.2 |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 229.7 | 175.9 | 76.2 | 12.0 | 5.2 | 41.8 | 18.6 | 28.7 | 34.6 | 30.1 | 5.3 | 35.3 | 1.4 | 0.0 |
| **Pr > F** [2] | 0.02 | 0.17 | 0.16 | 0.57 | 0.88 | 0.09 | 0.21 | 0.51 | 0.06 | 0.46 | 0.40 | 0.37 | 0.30 | 0.22 |
| **LSD** (*P* = 0.05) [2] | 55.2 | NS | NS | NS | NS | 50.5* | NS | NS | 5.8* | NS | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | | | | | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | | | | | | | | |
| Healed 5 days | 288.0 | 197.4 | 67.9 | 16.9 | 6.0 | 73.8 | 26.0 | 25.4 | 30.0 | 33.7 | 7.5 | 41.2 | 2.3 | 1.1 |
| Fresh cut | 191.0 | 142.1 | 71.2 | 10.6 | 5.9 | 38.3 | 22.9 | 27.4 | 33.5 | 28.9 | 7.3 | 36.1 | 3.0 | 0.0 |
| **Pr > F** [2] | 0.00 | 0.06 | 0.65 | 0.02 | 0.91 | 0.05 | 0.64 | 0.58 | 0.14 | 0.09 | 0.91 | 0.19 | 0.54 | 0.11 |
| **LSD** (*P* = 0.05) [2] | 46.2 | 56.8 | NS | 5.3 | NS | 34.5 | NS | NS | NS | 5.8 | NS | NS | NS | NS |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | | | | | | | | |
| Earlier planting date | 211.7 | 147.4 | 66.7 | 14.1 | 6.9 | 50.3 | 26.3 | 26.4 | 31.7 | 31.9 | 6.8 | 38.7 | 2.7 | 0.5 |
| Later planting date | 267.3 | 192.1 | 72.4 | 13.4 | 5.0 | 61.8 | 22.6 | 26.4 | 31.8 | 30.7 | 8.0 | 38.7 | 2.6 | 0.6 |
| **Pr > F** [2] | 0.02 | 0.11 | 0.43 | 0.78 | 0.09 | 0.47 | 0.57 | 0.98 | 0.94 | 0.65 | 0.65 | 0.99 | 0.87 | 0.83 |
| **LSD** (*P* = 0.05) [2] | 46.2 | NS | NS | NS | 2.2 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| Interaction between healing and planting | | | | | | | | | | | | | | |
| **Pr > F** [2] | 0.3 | 0.4 | 0.5 | 0.2 | 0.7 | 0.8 | 0.5 | 0.4 | 0.4 | 0.2 | 0.1 | 0.7 | 0.0 | 0.8 |

1 Undersize is defined as potatoes less than 1 7/8 inches in diameter.

2 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 8. Effect of experimental treatment on value per acre of Dark Red Norland tubers.*

| Treatment and rate per cwt | Gross value of yield [1] Fresh market [3] | Effect of treatment on value [2] Fresh market [3] |
|---|---|---|
| **Earlier Planted Trial (4/21/99)** | | |
| **Seedpieces cut and healed before planting** | | |
| No chemical treatment, healed 5 days | $1577 | $644 |
| **Seedpieces fresh cut - cut and treated day of planting** | | |
| No chemical treatment | 933 | 0 |
| **Pr > F** [4] | < 0.01 | < 0.01 |
| **LSD** (*P* = 0.05) [4] | 195 | 195 |
| **Later Planted Trial (4/28/99)** | | |
| **Seedpieces cut and healed before planting** | | |
| No chemical treatment, healed 5 days | 1842 | 466 |
| **Seedpieces fresh cut - cut and treated day of planting** | | |
| No chemical treatment | 1376 | 0 |
| **Pr > F** [4] | 0.04 | 0.04 |
| **LSD** (*P* = 0.05) [4] | 422 | 422 |
| ***Analysis of the effect of healing and planting time*** | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | |
| Healed 5 days | 1710 | 555 |
| Fresh cut | 1154 | 0 |
| **Pr > F** [4] | 0.02 | <0.01 |
| **LSD** (*P* = 0.05) [4] | 433 | 175 |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | |
| Earlier planting date | 1255 | 322 |
| Later planting date | 1609 | 233 |
| **Pr > F** [4] | 0.10 | 0.28 |
| **LSD** (*P* = 0.05) [4] | 433.0* | NS |
| Interaction between healing and planting | | |
| **Pr > F** [4] | 0.65 | 0.28 |

1 Cost of seedpiece treatment chemicals were not included in calculations for this trial.
2 Gross value of untreated control (fresh cut, no chemical applied) minus gross value for the treatment.
3 Typical 1999 fresh market pricing: 4-6 oz. $8.50/cwt, 6-10 oz. $10.50/cwt, 10-13 oz. $11.50, >13 oz. $12.00, < 4 oz. and culls $1.75/cwt.
4 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 9. Effect of potato seedpiece treatment on field emergence, stand and height of Russet Burbank potatoes.*

| Treatment and rate per cwt | Percentage of plants emerged on: [1] | | | | | | | Avg. days to emergence [2] | Avg. height (cm) [3] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Per plant | | | Per hill | | |
| | 5/25 | 5/28 | 6/1 | 6/7 | 6/11 | 6/15 | 6/22 | | 5/28 | 6/7 | 6/22 | 5/28 | 6/7 | 6/22 |
| **Earlier Planted Trial (4/21/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 72.5 | 71.5 | 74.5 | 74.0 | 74.5 | 78.0 | --- | 38.2 | 6.6 | 21.1 | --- | 4.8 | 15.5 | --- |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 68.5 | 69.0 | 68.5 | 69.0 | 70.5 | 73.0 | --- | 36.6 | 5.5 | 20.6 | --- | 3.8 | 14.1 | --- |
| TOPS-MZ (Gustafson), 0.75 lb/cwt | 82.0 | 81.0 | 82.0 | 81.5 | 82.0 | 82.0 | --- | 36.0 | 6.5 | 18.7 | --- | 5.2 | 15.0 | --- |
| TOPS-MZ / Curzate, 0.75 lb/cwt | 78.5 | 77.0 | 78.5 | 77.5 | 78.0 | 76.5 | --- | 36.4 | 6.0 | 19.7 | --- | 4.6 | 15.2 | --- |
| MZ / Curzate, 0.75 lb/cwt | 78.0 | 75.5 | 77.0 | 74.5 | 79.5 | 76.5 | --- | 40.7 | 6.7 | 20.5 | --- | 5.0 | 15.2 | --- |
| LS 214, 0.75 lb/cwt | 85.5 | 87.0 | 84.5 | 85.0 | 85.0 | 84.5 | --- | 35.9 | 5.7 | 20.2 | --- | 5.0 | 17.2 | --- |
| LS 295, 0.75 lb/cwt | 58.5 | 56.5 | 59.0 | 68.5 | 69.5 | 60.5 | --- | 46.1 | 5.3 | 19.0 | --- | 3.0 | 13.2 | --- |
| TOPS-MZ (Auxein), 1 lb/cwt | 85.0 | 84.5 | 80.5 | 85.0 | 85.5 | 84.5 | --- | 37.6 | 6.8 | 21.1 | --- | 5.7 | 17.9 | --- |
| TOPS-MZ + AuxiGro 0.1 oz. (pre-mix)[4], 1 lb/cwt | 83.0 | 81.0 | 82.0 | 73.5 | 73.5 | 84.0 | --- | 42.2 | 6.4 | 21.2 | --- | 5.2 | 15.2 | --- |
| TOPS-MZ + AuxiGro 0.2 oz. (pre-mix)[4], 1 lb/cwt | 81.5 | 80.0 | 81.0 | 80.0 | 79.0 | 80.5 | --- | 36.3 | 5.7 | 20.6 | --- | 4.6 | 16.4 | --- |
| TOPS-MZ + AuxiGro 0.4 oz. (pre-mix)[4], 1 lb/cwt | 80.0 | 79.0 | 80.0 | 78.0 | 79.0 | 81.5 | --- | 36.1 | 6.0 | 21.1 | --- | 4.7 | 16.4 | --- |
| **Pr > F** [5] | <0.01 | <0.01 | <0.01 | 0.16 | 0.21 | <0.01 | --- | 0.47 | 0.24 | 0.52 | --- | 0.01 | 0.28 | --- |
| **LSD** ($P = 0.05$) [5] | 10.5 | 10.4 | 11.0 | NS | NS | 10.0 | --- | NS | NS | NS | --- | 1.2 | NS | --- |
| **Later Planted Trial (4/28/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 76.5 | 70.5 | 77.5 | 78.0 | 79.0 | 80.0 | 80.5 | 31.3 | 5.5 | 20.2 | 44.8 | 4.0 | 15.9 | 36.2 |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 61.5 | 63.0 | 68.5 | 71.0 | 74.0 | 75.0 | 78.5 | 31.0 | 4.5 | 18.9 | 42.0 | 2.8 | 13.5 | 33.1 |
| **Pr > F** [5] | 0.32 | 0.49 | 0.39 | 0.43 | 0.43 | 0.46 | 0.62 | 0.87 | 0.44 | 0.43 | 0.43 | 0.32 | 0.31 | 0.47 |
| **LSD** ($P = 0.05$) [5] | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | | | | | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | | | | | | | | |
| Healed 5 days | 74.5 | 71.0 | 76.0 | 76.0 | 76.8 | 79.0 | --- | 34.7 | 6.1 | 20.7 | --- | 4.4 | 15.7 | --- |
| Fresh cut | 65.0 | 66.0 | 68.5 | 70.0 | 72.3 | 74.0 | --- | 33.8 | 5.0 | 19.7 | --- | 3.3 | 13.8 | --- |
| **Pr > F** [5] | 0.17 | 0.41 | 0.20 | 0.27 | 0.34 | 0.27 | --- | 0.42 | 0.09 | 0.51 | --- | 0.08 | 0.26 | --- |
| **LSD** ($P = 0.05$) [5] | NS | NS | NS | NS | NS | NS | --- | NS | 1.3* | NS | --- | 1.3* | NS | --- |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | | | | | | | | |
| Earlier planting date | 70.5 | 70.3 | 71.5 | 71.5 | 72.5 | 75.5 | --- | 37.4 | 6.1 | 20.9 | --- | 4.3 | 14.8 | --- |
| Later planting date | 69.0 | 66.8 | 73.0 | 74.5 | 76.5 | 77.5 | --- | 31.1 | 5.0 | 19.6 | --- | 3.4 | 14.7 | --- |
| **Pr > F** [5] | 0.82 | 0.56 | 0.79 | 0.57 | 0.39 | 0.65 | --- | 0.00 | 0.08 | 0.38 | --- | 0.14 | 0.95 | --- |
| **LSD** ($P = 0.05$) [5] | NS | NS | NS | NS | NS | NS | --- | 2.5 | 1.3 | NS | --- | NS | NS | --- |
| Interaction between healing and planting | | | | | | | | | | | | | | |
| **Pr > F** [5] | 0.41 | 0.67 | 0.79 | 0.85 | 0.91 | 1.00 | --- | 0.56 | 1.0 | 0.8 | --- | 0.9 | 0.8 | --- |

1. Based on 50 seedpieces planted/50 feet of row. A sample from each plot in the early planted trial was dug and rated for disease on June 16 so emergence was not recorded for the early trial on June 22.
2. The average number of days to emergence was calculated for all plants which did come up.
3. Avg. height per plant includes only those plants which grew. To calculate ave. height per hill, a height of 0 is included in the average for hills where no plant grew.
4. Rates of Auxigro expressed as oz. active ingredient/100 lb TOPS-MZ
5. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the $P = 0.05$ (or $P = 0.10$) level. * = Difference between treatments were significant at $P = 0.10$, but not at $P = 0.05$.

*Table 10. Effect of potato seedpiece treatment on decay, black leg and Rhizoctonia symptoms and plant development on Russet Burbank potatoes.*

| Treatment and rate per cwt | Evaluation of 10 hills per replication [1] | | | | | | |
|---|---|---|---|---|---|---|---|
| | % decay [2] | % of plants with black leg | Black leg severity | % Rhizoctonia infection [3] | No. of stems per plant | Ave. fresh weight (g) | |
| | | | | | | Leaves + stems per hill | Daughter tubers per hill |
| **Earlier Planted Trial (4/21/99)** | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | |
| No chemical treatment, healed 5 days | 8.7 | 2.5 | 1.2 | 22.6 | 3.0 | 390.7 | 28.1 |
| **Fresh cut - cut and treated day of planting** | | | | | | | |
| No chemical treatment | 24.9 | 5.0 | 1.4 | 24.4 | 3.8 | 393.5 | 13.9 |
| TOPS-MZ (Gustafson), 0.75 lb/cwt | 62.8 | 7.5 | 4.5 | 7.3 | 3.5 | 485.9 | 16.6 |
| TOPS-MZ / Curzate, 0.75 lb/cwt | 52.3 | 7.5 | 2.7 | 5.0 | 3.2 | 473.4 | 15.5 |
| MZ / Curzate, 0.75 lb/cwt | 55.6 | 2.5 | 1.6 | 7.6 | 3.2 | 509.2 | 23.0 |
| LS 214, 0.75 lb/cwt | 43.2 | 2.5 | 1.6 | 4.4 | 3.4 | 499.5 | 21.9 |
| LS 295, 0.75 lb/cwt | 50.7 | 5.0 | 3.1 | 10.0 | 1.8 | 255.7 | 7.6 |
| TOPS-MZ (Auxein), 1 lb/cwt | 27.6 | 2.5 | 3.1 | 6.5 | 4.2 | 588.0 | 35.0 |
| TOPS-MZ + AuxiGro 0.1 oz. (pre-mix)[4], 1 lb/cwt | 28.6 | 0.0 | 0.0 | 13.4 | 3.6 | 466.1 | 18.8 |
| TOPS-MZ + AuxiGro 0.2 oz. (pre-mix)[4], 1 lb/cwt | 33.5 | 0.0 | 0.0 | 3.8 | 4.2 | 521.6 | 25.9 |
| TOPS-MZ + AuxiGro 0.4 oz. (pre-mix)[4], 1 lb/cwt | 30.1 | 0.0 | 0.0 | 8.9 | 3.9 | 547.2 | 26.6 |
| **Pr > F** [5] | 0.02 | 0.22 | 0.57 | 0.14 | < 0.01 | 0.07 | 0.34 |
| **LSD** (*P* = 0.05) [5] | 28.5 | NS | NS | NS | 1.0 | 186.5* | NS |
| **Later Planted Trial (4/28/99)** | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | |
| No chemical treatment, healed 5 days | 30.1 | 0.0 | 0.0 | 22.2 | 4.1 | 643.5 | 178.3 |
| **Fresh cut - cut and treated day of planting** | | | | | | | |
| No chemical treatment | 38.2 | 2.5 | 0.7 | 27.3 | 3.6 | 726.9 | 85.4 |
| **Pr > F** [5] | 0.61 | 0.39 | 0.39 | 0.65 | 0.44 | 0.15 | 0.24 |
| **LSD** (*P* = 0.05) [5] | NS | NS | NS | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | |
| Healed 5 days | 19.4 | 1.3 | 0.6 | 22.4 | 3.6 | 517.1 | 103.2 |
| Fresh cut | 31.6 | 3.8 | 1.0 | 25.9 | 3.7 | 560.2 | 49.6 |
| **Pr > F** [5] | 0.28 | 0.32 | 0.61 | 0.70 | 0.83 | 0.31 | 0.09 |
| **LSD** (*P* = 0.05) [5] | NS | NS | NS | NS | NS | NS | 63.7* |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | |
| Earlier planting date | 16.8 | 3.8 | 1.3 | 23.5 | 3.4 | 392.1 | 21.0 |
| Later planting date | 34.2 | 1.3 | 0.3 | 24.8 | 3.8 | 685.2 | 131.9 |
| **Pr > F** [5] | 0.14 | 0.32 | 0.26 | 0.88 | 0.39 | <.01 | <0.01 |
| **LSD** (*P* = 0.05) [5] | NS | NS | NS | NS | NS | 89.9 | 63.7 |
| Interaction between healing and planting | | | | | | | |
| **Pr > F** [5] | 0.71 | 1.00 | 0.76 | 0.85 | 0.25 | 0.34 | 0.20 |

1 Plants in the earlier planted trial were evaluated on June 16. The later planted trial was evaluated June 25.

2 Severity of seedpiece decay rated on a Horsfall-Barratt scale of 0 (no decay) to 11 (100% decay). Ratings were converted to percentages.

3 Severity rated on a Horsfall-Barratt scale of 0 (no infection) to 11 (death of all stems due to Rhizoctonia infection). Ratings were converted to percentages.

4 Rates of Auxigro expressed as oz active ingredient/100 lb TOPS-MZ

5 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 11. Effect of seedpiece treatment on yield, proportion of US#1, undersize and culls and size grades of Russet Burbank potatoes.*

| Treatment and rate per acre | Total yield cwt/A | US#1 | | Undersize[1] | | Culls | | Specific gravity | Size grades of US#1 potatoes | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | cwt/A | % | cwt/A | % | cwt/A | % | | % < 4 oz. | % 4-6 oz. | % 6-10 oz. | % 10-13 oz. | % 6-13 oz. | % 13-16 oz. | % > 16 oz. |
| **Earlier Planted Trial (4/21/99)** | | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | | |
| 7 No chemical treatment, healed 5 days | 269.7 | 121.2 | 44.9 | 24.2 | 9.2 | 124.3 | 45.8 | 1.061 | 39.0 | 37.6 | 21.0 | 2.4 | 23.4 | 0.0 | 0.0 |
| **Seedpieces fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | | |
| 8 Untreated Control | 219.9 | 91.3 | 41.4 | 25.3 | 11.6 | 103.3 | 47.0 | 1.061 | 47.3 | 35.3 | 16.7 | 0.6 | 17.3 | 0.0 | 0.0 |
| 9 TOPS-MZ (Gustafson), 0.75 lb/cwt | 234.5 | 95.0 | 40.9 | 30.0 | 13.0 | 109.4 | 46.1 | 1.062 | 56.5 | 27.5 | 16.0 | 0.0 | 16.0 | 0.0 | 0.0 |
| 10 TOPS-MZ / Curzate, 0.75 lb/cwt | 242.8 | 108.5 | 44.9 | 28.7 | 11.9 | 105.7 | 43.3 | 1.062 | 42.7 | 40.8 | 14.7 | 1.1 | 15.8 | 0.7 | 0.0 |
| 11 MZ / Curzate, 0.75 lb/cwt | 242.5 | 95.7 | 39.4 | 26.8 | 11.1 | 120.1 | 49.5 | 1.062 | 49.9 | 29.6 | 17.7 | 2.0 | 19.7 | 0.8 | 0.0 |
| 12 LS 214, 0.75 lb/cwt | 267.9 | 119.1 | 43.4 | 29.0 | 11.6 | 119.8 | 45.0 | 1.062 | 41.2 | 42.3 | 15.5 | 0.9 | 16.4 | 0.0 | 0.0 |
| 13 LS 295, 0.75 lb/cwt | 216.7 | 65.4 | 29.9 | 20.1 | 9.2 | 131.2 | 60.9 | 1.062 | 37.5 | 35.1 | 25.2 | 2.1 | 27.3 | 0.0 | 0.0 |
| 14 TOPS-MZ (Auxein), 1 lb/cwt | 248.8 | 131.9 | 52.5 | 30.9 | 12.9 | 86.1 | 34.6 | 1.061 | 46.7 | 34.2 | 17.4 | 1.7 | 19.1 | 0.0 | 0.0 |
| 15 TOPS-MZ + AuxiGro 0.1 oz. (pre-mix) [2], 1 lb/cwt. | 265.4 | 116.2 | 44.0 | 28.7 | 11.2 | 120.4 | 44.8 | 1.061 | 47.7 | 34.6 | 17.0 | 0.7 | 17.7 | 0.0 | 0.0 |
| 16 TOPS-MZ + AuxiGro 0.2 oz. (pre-mix) [2], 1 lb/cwt. | 260.2 | 109.3 | 41.7 | 27.3 | 10.7 | 123.7 | 47.6 | 1.063 | 48.6 | 37.2 | 13.7 | 0.5 | 14.2 | 0.0 | 0.0 |
| 17 TOPS-MZ + AuxiGro 0.4 oz. (pre-mix) [2], 1 lb/cwt. | 273.2 | 114.9 | 42.7 | 30.4 | 11.8 | 128.0 | 45.5 | 1.062 | 52.6 | 34.1 | 13.4 | 0.0 | 13.4 | 0.0 | 0.0 |
| **Pr > F** [3] | 0.02 | 0.02 | 0.02 | 0.30 | 0.60 | 0.07 | <0.01 | 0.68 | 0.02 | 0.10 | 0.46 | 0.36 | 0.33 | 0.57 | -- |
| **LSD** ($P$ = 0.05) [3] | 35.0 | 33.3 | 9.5 | NS | NS | 27.1* | 9.7 | NS | 10.4 | 9.2* | NS | NS | NS | NS | -- |
| **Later Planted Trial (4/28/99)** | | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | | |
| 24 No chemical treatment, healed 5 days | 303.2 | 139.0 | 45.7 | 43.0 | 14.0 | 121.2 | 40.3 | 1.063 | 49.8 | 37.8 | 11.9 | 0.5 | 12.4 | 0.0 | 0.0 |
| **Seedpieces fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | | |
| 25 Untreated Control | 319.4 | 142.4 | 44.7 | 36.2 | 11.4 | 140.8 | 43.9 | 1.064 | 45.1 | 35.5 | 19.5 | 0.0 | 19.5 | 0.0 | 0.0 |
| **Pr > F** [3] | 0.55 | 0.86 | 0.86 | 0.40 | 0.20 | 0.42 | 0.48 | 0.48 | 0.37 | 0.46 | 0.08 | 0.39 | 0.07 | -- | -- |
| **LSD** ($P$ = 0.05) [3] | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 9.4* | NS | 8.0* | -- | -- |
| ***Analysis of the effect of healing and planting time*** | | | | | | | | | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | | | | | | | | | |
| Healed 5 days | 286.5 | 130.1 | 45.3 | 33.6 | 11.6 | 122.8 | 43.1 | 1.062 | 44.4 | 37.7 | 16.5 | 1.4 | 17.9 | -- | -- |
| Fresh cut | 269.7 | 116.8 | 43.0 | 30.8 | 11.5 | 122.1 | 45.5 | 1.062 | 46.2 | 35.4 | 18.1 | 0.3 | 18.4 | -- | -- |
| **Pr > F** [3] | 0.29 | 0.37 | 0.60 | 0.40 | 0.88 | 0.95 | 0.53 | 0.50 | 0.61 | 0.25 | 0.67 | 0.21 | 0.90 | -- | -- |
| **LSD** ($P$ = 0.05) [3] | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | -- | -- |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | | | | | | | | | |
| Earlier planting date | 244.8 | 106.3 | 43.2 | 24.8 | 10.4 | 113.8 | 46.4 | 1.061 | 43.2 | 36.5 | 18.9 | 1.5 | 20.3 | -- | -- |
| Later planting date | 311.3 | 140.7 | 45.2 | 39.6 | 12.7 | 131.0 | 42.1 | 1.063 | 47.4 | 36.6 | 15.7 | 0.2 | 15.9 | -- | -- |
| **Pr > F** [3] | <0.01 | 0.04 | 0.64 | <0.01 | 0.02 | 0.17 | 0.27 | 0.01 | 0.24 | 0.93 | 0.42 | 0.17 | 0.32 | -- | -- |
| **LSD** ($P$ = 0.05) [3] | 33.5 | 32.0 | NS | 7.3 | 1.9 | NS | NS | 0.002 | NS | NS | NS | NS | NS | -- | -- |
| Interaction between healing and planting | | | | | | | | | | | | | | | |
| **Pr > F** [3] | 0.05 | 0.27 | 0.78 | 0.25 | 0.01 | 0.11 | 0.74 | 0.57 | 0.09 | 0.99 | 0.14 | 0.47 | 0.15 | -- | -- |

1. Undersize is defined as potatoes less than 1 7/8 inches in diameter.
2. Rates of Auxigro expressed as oz. active ingredient/100 lb TOPS-MZ
3. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) calculated. NS = not significant at the $P$ = 0.10 level. * = Difference between treatments were significant at $P$ = 0.10, but not at $P$ = 0.05.

*Table 12. Effect of experimental treatment on value per acre of Russet Burbank tubers.*

| Treatment and rate per cwt | Gross value of yield [1] | | Effect of treatment on value [2] | |
|---|---|---|---|---|
| | Fresh market [3] | Processing [4] | Fresh market [3] | Processing [4] |
| **Earlier Planted Trial (4/21/99)** | | | | |
| **Seedpieces cut and healed before planting** | | | | |
| No chemical treatment, healed 5 days | $1051 | $608 | $311 | $151 |
| **Seedpieces fresh cut - cut and treated day of planting** | | | | |
| No chemical treatment | 739 | 457 | 0 | 0 |
| TOPS-MZ (Gustafson), 0.75 lb/cwt | 721 | 474 | -18 | 17 |
| TOPS-MZ / Curzate, 0.75 lb/cwt | 878 | 526 | 139 | 69 |
| MZ / Curzate, 0.75 lb/cwt | 790 | 505 | 51 | 48 |
| LS 214, 0.75 lb/cwt | 996 | 580 | 257 | 123 |
| LS 295, 0.75 lb/cwt | 695 | 412 | -45 | -45 |
| TOPS-MZ (Auxein), 1 lb/cwt | 989 | 589 | 250 | 133 |
| TOPS-MZ + AuxiGro 0.1 oz. (pre-mix) [2], 1 lb/cwt | 928 | 567 | 189 | 111 |
| TOPS-MZ + AuxiGro 0.2 oz. (pre-mix) [2], 1 lb/cwt | 876 | 547 | 137 | 90 |
| TOPS-MZ + AuxiGro 0.4 oz. (pre-mix) [2], 1 lb/cwt | 885 | 569 | 146 | 112 |
| **Pr > F** [5] | 0.08 | 0.06 | 0.08 | 0.06 |
| **LSD** (*P* = 0.05) [5] | 248* | 124* | 248* | 124* |
| **Later Planted Trial (4/28/99)** | | | | |
| **Seedpieces cut and healed before planting** | | | | |
| No chemical treatment, healed 5 days | 1038 | 646 | -109 | -37 |
| **Seedpieces fresh cut - cut and treated day of planting** | | | | |
| No chemical treatment | 1147 | 683 | 0 | 0 |
| **Pr > F** [5] | 0.39 | 0.55 | 0.39 | 0.55 |
| **LSD** (*P* = 0.05) [5] | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | |
| Healed 5 days | 1044 | 627 | 101 | 57 |
| Fresh cut | 943 | 570 | 0 | 0 |
| **Pr > F** [5] | 0.36 | 0.29 | 0.42 | 0.33 |
| **LSD** (*P* = 0.05) [5] | NS | NS | NS | NS |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | |
| Earlier planting date | 895 | 532 | 156 | 75 |
| Later planting date | 1093 | 664 | -55 | -18 |
| **Pr > F** [5] | 0.09 | 0.03 | 0.12 | 0.13 |
| **LSD** (*P* = 0.05) [5] | 235* | 114 | NS | NS |
| Interaction between healing and planting | | | | |
| **Pr > F** [5] | 0.07 | 0.09 | 0.12 | 0.13 |

1 Cost of seedpiece treatment chemicals were not included in calculations for this trial.

2 Gross value of untreated control (fresh cut, no chemical applied) minus gross value for the treatment.

3 Typical 1999 fresh market pricing: 4-6 oz. $8.50/cwt, 6-10 oz. $10.50/cwt, 10-13 oz. $11.50, >13 oz. $12.00, < 4 oz. and culls $1.75/cwt.

4 Typical 1999 processing contract: Base price is $4.70/cwt for 69% US#1 (4 oz. min.); specific gravity of 1.077. A premium is paid for > 19% 10oz. or greater. For each 1% > 19% (max.= 32%) > 10oz. the price increases $0.03/cwt. The price < $0.03/cwt for each 1% below 19% to 10%. A decrease of $0.05 for each 1% of potatoes below 10% 10 oz. For each .001 difference in specific gravity > or < 1.080 (max.= 1.085), the price > or < $0.02/cwt. If the specific gravity is < 1.072 there is a $.25 decrease in price for each .001. Minimum specific gravity accepted is 1.070. Value of culls for processing is $1.50/cwt.

5 Analysis of variance was performed, and Fisher's protected least significant difference (LSD) calculated. NS = not significant at *P* = 0.10. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 13. Effect of potato seedpiece treatment on field emergence, stand and height of Snowden potatoes.*

| Treatment and rate per cwt | Percentage of plants emerged on: [1] | | | | | | | Avg. days to emergence [2] | Avg. height (cm) [3] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Per plant | | | Per hill | | |
| | 5/25 | 5/28 | 6/1 | 6/7 | 6/11 | 6/15 | 6/22 | | 5/28 | 6/7 | 6/22 | 5/28 | 6/7 | 6/22 |
| **Earlier Planted Trial (4/21/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 84.5 | 83.0 | 85.0 | 83.5 | 84.0 | 83.0 | --- | 36.5 | 9.0 | 20.5 | --- | 7.4 | 16.8 | --- |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 65.5 | 66.5 | 65.5 | 64.0 | 63.5 | 64.0 | --- | 36.2 | 7.3 | 18.0 | --- | 4.8 | 11.4 | --- |
| **Pr > F** [4] | 0.01 | 0.03 | 0.01 | 0.01 | <0.01 | 0.01 | --- | 0.80 | 0.21 | 0.12 | --- | 0.02 | 0.01 | --- |
| **LSD** (*P* = 0.05) [4] | 8.4 | 14.1 | 10.8 | 8.8 | 8.0 | 10.9 | --- | NS | NS | NS | --- | 1.8 | 2.7 | --- |
| **Later Planted Trial (4/28/99)** | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | |
| No chemical treatment, healed 5 days | 77.0 | 76.5 | 79.5 | 80.5 | 77.0 | 80.5 | 79.5 | 31.0 | 5.3 | 19.3 | 46.0 | 4.1 | 15.6 | 36.6 |
| **Fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | |
| No chemical treatment | 75.0 | 78.5 | 80.5 | 80.0 | 78.5 | 82.0 | 82.0 | 29.7 | 4.9 | 18.8 | 45.9 | 3.9 | 15.1 | 37.7 |
| **Pr > F** [4] | 0.51 | 0.51 | 0.79 | 0.64 | 0.44 | 0.22 | 0.19 | 0.55 | 0.72 | 0.87 | 0.97 | 0.82 | 0.86 | 0.65 |
| **LSD** (*P* = 0.05) [4] | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | | | | | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | | | | | | | | |
| Healed 5 days | 80.8 | 79.8 | 82.3 | 82.0 | 80.5 | 81.8 | --- | 33.8 | 7.2 | 19.9 | --- | 5.7 | 16.2 | --- |
| Fresh cut | 70.3 | 72.5 | 73.0 | 72.0 | 71.0 | 73.0 | --- | 33.0 | 6.1 | 18.4 | --- | 4.4 | 13.2 | --- |
| **Pr > F** [4] | <0.01 | 0.05 | 0.01 | <0.01 | <0.01 | <0.01 | --- | 0.44 | 0.18 | 0.43 | --- | 0.03 | 0.06 | --- |
| **LSD** (*P* = 0.05) [4] | 5.6 | 7.1 | 6.0 | 4.1 | 5.2 | 4.4 | --- | NS | NS | NS | --- | 1.2 | 3.0 | --- |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | | | | | | | | |
| Earlier planting date | 75.0 | 74.8 | 75.3 | 73.8 | 73.8 | 73.5 | --- | 36.4 | 8.2 | 19.2 | --- | 6.1 | 14.1 | --- |
| Later planting date | 76.0 | 77.5 | 80.0 | 80.3 | 77.8 | 81.3 | --- | 30.4 | 5.1 | 19.1 | --- | 4.0 | 15.3 | --- |
| **Pr > F** [4] | 0.70 | 0.40 | 0.11 | 0.01 | 0.11 | <0.01 | --- | <0.01 | <0.01 | 0.93 | --- | <0.01 | 0.38 | --- |
| **LSD** (*P* = 0.05) [4] | NS | NS | NS | 4.1 | NS | 4.4 | --- | 2.2 | 1.6 | NS | --- | 1.2 | NS | --- |
| Interaction between healing and planting | | | | | | | | | | | | | | |
| **Pr > F** [4] | 0.01 | 0.02 | <0.01 | <0.01 | <0.01 | <0.01 | --- | 0.66 | 0.4 | 0.6 | --- | 0.1 | 0.1 | --- |

1. Based on 50 seedpieces planted/50 feet of row. A sample from each plot in the early planted trial was dug and rated for disease on June 16 so emergence was not recorded for the early trial on June 22.
2. The average number of days to emergence was calculated for all plants which did come up.
3. Avg. height per plant includes only those plants which grew. To calculate avg. height per hill, a height of 0 is included in the average for hills where no plant grew.
4. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 14. Effect of potato seedpiece treatment on decay, black leg and Rhizoctonia symptoms and plant development on Snowden potatoes.*

| Treatment and rate per cwt | Evaluation of 10 hills per replication [1] | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | Avg. fresh weight (g) | |
| | % decay [2] | % of plants with black leg | Black leg severity | % Rhizoctonia infection [3] | No. of stems per plant | Leaves + stems) per hill | Daughter tubers per hill |
| **Earlier Planted Trial (4/21/99)** | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | |
| No chemical treatment, healed 5 days | 58.7 | 5.0 | 1.9 | 3.7 | 4.8 | 590.2 | 90.7 |
| **Fresh cut - cut and treated day of planting** | | | | | | | |
| No chemical treatment | 94.4 | 20.0 | 14.0 | 4.1 | 2.9 | 377.1 | 48.2 |
| **Pr > F** [4] | 0.01 | 0.01 | 0.07 | 0.80 | 0.09 | 0.02 | 0.01 |
| **LSD** (*P* = 0.05) [4] | 19.0 | 9.2 | 14.2* | NS | 2.4* | 161.6 | 22.5 |
| **Later Planted Trial (4/28/99)** | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | |
| No chemical treatment, healed 5 days | 82.0 | 0.0 | 0.0 | 16.0 | 4.3 | 700.2 | 213.9 |
| **Fresh cut - cut and treated day of planting** | | | | | | | |
| No chemical treatment | 94.4 | 2.5 | 2.4 | 12.9 | 4.4 | 731.4 | 221.0 |
| **Pr > F** [4] | 0.38 | 0.39 | 0.39 | 0.59 | 0.77 | 0.79 | 0.91 |
| **LSD** (*P* = 0.05) [4] | NS | NS | NS | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | |
| Healed 5 days | 70.3 | 2.5 | 0.9 | 9.9 | 4.5 | 645.3 | 152.3 |
| Fresh cut | 94.4 | 11.3 | 8.2 | 8.5 | 3.7 | 554.2 | 134.6 |
| **Pr > F** [4] | <0.01 | 0.01 | 0.01 | 0.59 | 0.07 | 0.26 | 0.53 |
| **LSD** (*P* = 0.05) [4] | 14.6 | 6.0 | 5.5 | NS | 0.9* | NS | NS |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | |
| Earlier planting date | 76.6 | 12.5 | 7.9 | 3.9 | 3.8 | 483.7 | 69.4 |
| Later planting date | 88.2 | 1.3 | 1.2 | 14.5 | 4.3 | 715.8 | 217.4 |
| **Pr > F** [4] | 0.10 | <0.01 | 0.02 | <0.01 | 0.25 | 0.01 | <0.01 |
| **LSD** (*P* = 0.05) [4] | 14.6* | 6.0 | 5.5 | 5.4 | NS | 169.4 | 61.7 |
| Interaction between healing and planting | | | | | | | |
| **Pr > F** [4] | 0.11 | 0.04 | 0.08 | 0.48 | 0.03 | 0.14 | 0.39 |

1 Plants in the earlier planted trial were evaluated on June 16. The later planted trial was evaluated June 25..

2 Severity of seedpiece decay rated on a Horsfall-Barratt scale of 0 (no decay) to 11 (100% decay). Ratings were converted to percentages.

3 Severity rated on a Horsfall-Barratt scale of 0 (no infection) to 11 (death of all stems due to Rhizoctonia infection). Ratings were converted to percentages.

4 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 15. Effect of seedpiece treatment on yield, proportion of US#1, undersize and culls and size grades of Snowden potatoes.*

| Treatment and rate per acre | Total yield cwt/A | US#1 | | Undersize[1] | | Culls | | Specific gravity | Size grades of US#1 potatoes | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | cwt/A | % | cwt/A | % | cwt/A | % | | % < 4 oz. | % 4-6 oz. | % 6-10 oz. | % 10-13 oz. | % 6-13 oz. | % 13-16 oz. | % > 16 oz. |
| **Earlier Planted Trial (4/21/99)** | | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | | |
| 5 No chemical treatment, healed 5 days | 277.1 | 232.6 | 83.8 | 14.0 | 5.1 | 30.5 | 11.1 | 1.069 | 38.2 | 29.3 | 26.2 | 5.0 | 31.2 | 1.3 | 0.0 |
| **Seedpieces fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | | |
| 6 Untreated Control | 258.7 | 200.0 | 77.2 | 11.5 | 4.5 | 47.2 | 18.2 | 1.069 | 31.1 | 26.2 | 29.1 | 7.1 | 36.2 | 4.4 | 2.1 |
| **Pr > F** [2] | 0.27 | 0.06 | <0.01 | 0.12 | 0.32 | 0.02 | <0.01 | 0.99 | 0.14 | 0.31 | 0.08 | 0.15 | 0.05 | 0.12 | 0.26 |
| **LSD** (*P* = 0.05) [2] | NS | 34.5* | 2.9 | NS | NS | 12.1 | 1.6 | NS | NS | NS | 3.7* | NS | 5.2 | NS | NS |
| **Later Planted Trial (4/28/99)** | | | | | | | | | | | | | | | |
| **Seedpieces cut and healed before planting** | | | | | | | | | | | | | | | |
| 22 No chemical treatment, healed 5 days | 357.1 | 259.0 | 72.5 | 12.2 | 3.4 | 85.8 | 24.0 | 1.071 | 30.5 | 28.4 | 32.5 | 6.4 | 38.9 | 1.5 | 0.8 |
| **Seedpieces fresh cut - cut and treated day of planting** | | | | | | | | | | | | | | | |
| 23 Untreated Control | 370.1 | 271.0 | 73.4 | 11.3 | 3.0 | 87.8 | 23.6 | 1.071 | 31.1 | 25.4 | 33.8 | 6.3 | 40.1 | 3.0 | 0.4 |
| **Pr > F** [2] | 0.45 | 0.25 | 0.81 | 0.43 | 0.43 | 0.91 | 0.91 | 0.89 | 0.90 | 0.28 | 0.72 | 0.97 | 0.85 | 0.33 | 0.63 |
| **LSD** (*P* = 0.05) [2] | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | | | | | | | | | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | | | | | | | | | | | | |
| Healed 5 days | 317.1 | 245.8 | 78.2 | 13.1 | 4.3 | 58.2 | 17.6 | 1.070 | 34.3 | 28.8 | 29.3 | 5.7 | 35.0 | 1.4 | 0.4 |
| Fresh cut | 314.4 | 235.5 | 75.3 | 11.4 | 3.8 | 67.5 | 20.9 | 1.070 | 31.1 | 25.8 | 31.5 | 6.7 | 38.2 | 3.7 | 1.3 |
| **Pr > F** [2] | 0.84 | 0.25 | 0.09 | 0.13 | 0.31 | 0.30 | 0.09 | 0.90 | 0.31 | 0.14 | 0.23 | 0.54 | 0.28 | 0.07 | 0.31 |
| **LSD** (*P* = 0.05) [2] | NS | NS | 3.4* | NS | NS | NS | 4.0* | NS | NS | NS | NS | 3.4 | 6.2 | 2.5* | NS |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | | | | | | | | | | | | |
| Earlier planting date | 267.9 | 216.3 | 80.5 | 12.7 | 4.8 | 38.8 | 14.7 | 1.069 | 34.6 | 27.7 | 27.7 | 6.1 | 33.7 | 2.9 | 1.1 |
| Later planting date | 363.6 | 265.0 | 73.0 | 11.7 | 3.2 | 86.8 | 23.8 | 1.071 | 30.8 | 26.9 | 33.2 | 6.4 | 39.5 | 2.2 | 0.6 |
| **Pr > F** [2] | <0.01 | <0.01 | <0.01 | 0.36 | <0.01 | <0.01 | <0.01 | 0.02 | 0.23 | 0.66 | 0.01 | 0.84 | 0.06 | 0.59 | 0.56 |
| **LSD** (*P* = 0.05) [2] | 29.2 | 18.8 | 3.4 | NS | 1.0 | 19.0 | 4.0 | 0.002 | NS | NS | 3.9 | NS | 6.2* | NS | NS |
| Interaction between healing and planting | | | | | | | | | | | | | | | |
| **Pr > F** [2] | 0.26 | 0.03 | 0.04 | 0.48 | 0.81 | 0.40 | 0.06 | 0.89 | 0.23 | 0.98 | 0.64 | 0.49 | 0.50 | 0.52 | 0.15 |

1 Undersize is defined as potatoes less than 1 7/8 inches in diameter.

2 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.

*Table 16. Effect of experimental treatment on value per acre of Snowden tubers.*

| Treatment and rate per cwt | Gross value of yield [1] | | Effect of treatment on value [2] | |
|---|---|---|---|---|
| | Fresh market [3] | Chipping [4] | Fresh market [3] | Chipping [4] |
| **Earlier Planted Trial (4/21/99)** | | | | |
| **Seedpieces cut and healed before planting** | | | | |
| No chemical treatment, healed 5 days | 918 | 1025 | 60 | 119 |
| **Seedpieces fresh cut - cut and treated day of planting** | | | | |
| No chemical treatment | 858 | 906 | 0 | 0 |
| **Pr > F** [5] | 0.31 | 0.06 | 0.31 | 0.06 |
| **LSD** (*P* = 0.05) [5] | NS | 131.1* | NS | 131.1* |
| **Later Planted Trial (4/28/99)** | | | | |
| **Seedpieces cut and healed before planting** | | | | |
| No chemical treatment, healed 5 days | 1158 | 1265 | -45 | -35 |
| **Seedpieces fresh cut - cut and treated day of planting** | | | | |
| No chemical treatment | 1203 | 1300 | 0 | 0 |
| **Pr > F** [5] | 0.52 | 0.55 | 0.52 | 0.55 |
| **LSD** (*P* = 0.05) [5] | NS | NS | NS | NS |
| ***Analysis of the effect of healing and planting time*** | | | | |
| Healing vs. fresh cut *(data pooled for planting dates)* | | | | |
| Healed 5 days | 1038 | 1145 | 8 | 42 |
| Fresh cut | 1030 | 1103 | 0 | 0 |
| **Pr > F** [5] | 0.87 | 0.41 | 0.85 | 0.19 |
| **LSD** (*P* = 0.05) [5] | NS | NS | NS | NS |
| Effect of planting time *(data pooled for healed vs. fresh cut treatment)* | | | | |
| Earlier planting date | 888 | 965 | 30 | 60 |
| Later planting date | 1181 | 1283 | -22 | -18 |
| **Pr > F** [5] | < 0.01 | < 0.01 | 0.21 | 0.03 |
| **LSD** (*P* = 0.05) [5] | 107 | 109 | NS | 67 |
| Interaction between healing and planting | | | | |
| **Pr > F** [5] | 0.29 | 0.14 | 0.21 | 0.03 |

1 Cost of seedpiece treatment chemicals were not included in calculations for this trial.

2 Gross value of untreated control (fresh cut, no chemical applied) minus gross value for the treatment.

3 Typical 1999 fresh market pricing: 4-6 oz. $8.50/cwt, 6-10 oz. $10.50/cwt, 10-13 oz. $11.50, >13 oz. $12.00, < 4 oz. and culls $1.75/cwt.

4 Typical 1999 chipping price of $4.75/cwt for a size range of 1 7/8 to 4" (estimated to be all US#1 potatoes from our size grading except those > 16 oz.) Process grade for chip stock (undersize + culls + >16 oz.) = $1.75/cwt.

5 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at the *P* = 0.05 (or *P* = 0.10) level. * = Difference between treatments were significant at *P* = 0.10, but not at *P* = 0.05.