PHREC 97-05a

NEBRASKA

POTATO EYES

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MATRIX will be readily available this year throughout Nebraska (so I've been told by DuPont). Here's some management highlights from the label:

1. Controls pre- and post-emergent weeds
2. One to 1½ ounces product per acre
3. Best applied before potatoes emerge; can be applied afterwards
4. May be mixed with Lexone/Sencor, Dual, Prowl, Eptam, Lorox
5. Irrigate 1/3 inch 4 hours to 5 days after application
6. May be chemigated
7. If weeds are present, add surfactant
8. Do NOT cultivate 7 days before or after postemergent application
9. Controls seedling hairy but NOT black nightshade (add DUAL). see Nebr. Potato Eyes, Spring 1991 issue, page 3.

Late Blight spring preparation begins. Here's tips for April, May and June:

1. Warm seed to 50-55 F before cutting
2. Cut and plant before sprout emergence
3. Note – no seed treatment against late blight
4. Plant in well-drained, moist soil
5. Plant in soil at 50 F and rising
6. Do not plant shallow
7. Destroy unused seedpieces or parts
8. Do not mix seed lots
9. Eliminate cull piles
10. Form full hills/rows
11. Monitor emerged plants in low, wet areas
12. If plants emerged and it rained, apply a protectant right away
13. Keep track of late blight severity values in your area to start treatment and manage intervals between applications
14. Keep informed about possible late blight observed in your area
15. Stay in touch with county staff about diseased tomatoes

Late blight is on the world-wide-web; more next issue.

Alexander D. Pavlista

Ranger Russet: Field Management Profile

A number of Nebraska growers have asked me to put together a management profile on Ranger Russet for this Spring. Ranger Russet is grown for both the French fry, as an earlier frier than Russet Burbank, and the fresh markets. In an earlier "Nebraska Potato Eyes" (Spring, 1992, page 7), Ranger Russet was highlighted in the "Cultivar" column and it was reported in the Amer. Potato Jour. (6), so I will try not to repeat much.

Characteristics

(Table 1) Ranger Russet is an indeterminate variety whose vine is medium to large, upright and spreading. It is medium to late maturing. Specific gravity is high for a russet and yields are larger than Russet Burbank. Sugar content is medium after storage at 45 F. Ranger Russet develops solids more rapidly than Russet Burbank and, therefore, are ready earlier for processing, about two weeks. Note, although it will get leafroll viral infection, net necrosis in tubers from this infection is rare. It is also susceptible to early blight during the growing season but does not often get early blight on tubers. Ranger Russet is susceptible to common scab. Yield and specific gravity data in Nebraska are reported in Tables 2 and 3.

Table 1. Summary of Characteristics and Defects:

Growth Type – indeterminate.

Maturity – medium to late; full season.

Dormancy – short to medium, 2 to 3 months.

Vine – medium to large, upright and spreading.

Leaves – large and broad, medium green color.

Flowers – abundant, red-purple.

Eyes – moderately shallow to deep, high number, well distributed.

Tubers – long, slightly flattened; medium russet skin.

Set – light, less in number than R. Burbank; middle of hill.

Specific Gravity – higher than most russets.

Sugar – lower than R. Burbank.

Yields – higher than R. Burbank.

Stem End Discoloration – moderately resistant.

Bruising – moderately susceptible to shatter and susceptible to internal blackspot.

External Defects – moderately resistant to tuber malformations.

Internal Defects – highly resistant to hollow heart.

Diseases susceptibility – susceptible to late blight and common scab, moderately so to leafroll virus, foliar early blight, and blackleg.

Diseases tolerability – moderately tolerant to early dying, tuber early blight, dry rot, and leafroll net necrosis, and resistant to PVX and PVY.

Herbicide – resistant to metribuzin injury; no problems reported.

Ranger Russet: Field Management Profile (cont.)

Table 2. Yield and specific gravity of Ranger Russet in Nebraska as reported by growers in a winter 1995-96 survey.

Nebraska Region	Yield cwt/acre	Specific Gravity
No.Central	400-600 (summer & fall crops)	1.085-90
So.Central	250-350 (summer crop)	1.080-85
Panhandle	300-500 (fall crop)	1.070-90

Table 3. Yield and specific gravity of Ranger Russet compared to Russet Burbank and Russet Norkotah in variety trials conducted in the Panhandle and southern part of Nebraska, 1990 to 1996 (16 trials).

Variety	Yield cwt/acre	Specific Gravity
Ranger Rus.	317	1.081
Rus. Burbank	283	1.075
Rus. Norkotah	267	1.072

Seed

Because of their short dormancy, Ranger Russet seed tubers will physiologically age quicker than long season russets such as Russet Burbank. Cut or whole seedpieces are acceptable but they should weigh at least 2 ounces. Eyes are uniformly distributed so blind pieces should not exist unless the pieces are too small. Spacing for seed production is 6 to 7 inches. This variety tends to oversize; therefore, for fresh or process markets, seedpieces are placed 8 to 10 inches (4) or 9 to 12 inches (1). See "Nebraska Potato Eyes" (Spring 1995 issue pages 8-9). Although Ranger Russet is highly resistant to hollow heart, at spacings at or greater than 12 inches, hollow heart may become a problem, over 20% of US1A tubers (1).

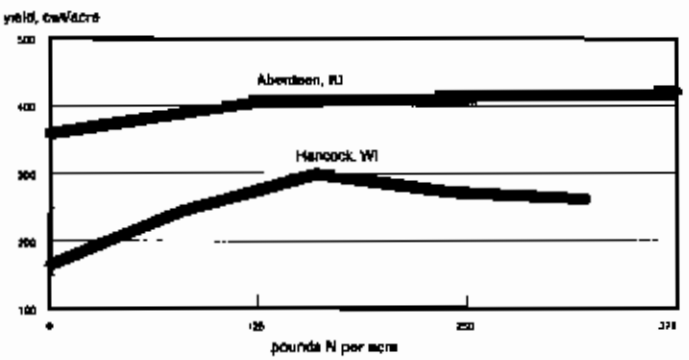
Fertilization

In general, recommendations for Russet Burbank fertilization for phosphorus and potassium can be followed (5). Phosphorus should be about 160 lb P_2O_5/acre (= 70 lb P/acre) and potassium should range between 0 to 75 lb K_2O/acre (= 60 lb K/acre) depending on soil test results. Sulfur (200-400 lb ammonium sulfate/acre) is recommended for common scab control. There is little need to add micronutrients in most cases but check actual soil levels (5).

Nitrogen - The requirement for Ranger Russet is different from that of Russet Burbank. Nitrogen can be applied all preplant, or half preplant and the rest during rapid vine growth or based on petiole nitrate analysis. Applying excess nitrogen should be avoided, especially after mid-bulking. Late-season nitrogen application may cause problems with vine desiccation and storability of tubers.

When applied all preplant, nitrogen application in Idaho is optimal at about 130-150 lb/acre up to 210 lb/acre, depending on soil test results. With seasonal application of nitrogen based on petiole nitrate-N concentration, starter should be 60 to 105 lb N/acre (4). In Wisconsin, when nitrogen was applied half preplant and half at emergence, optimal total N was 160 lb/acre (1; Figure 1). When application of nitrogen (ammonium nitrate) is split one-quarter before planting and the rest applied equally (one-eighth) every two weeks, the optimal total N was 125 lb/acre in Aberdeen, ID (3; Figure 1).

Figure 1 Yield of Ranger Russet with respect to nitrogen application at Aberdeen, ID, (1986-88) and Hancock, WI (1994)



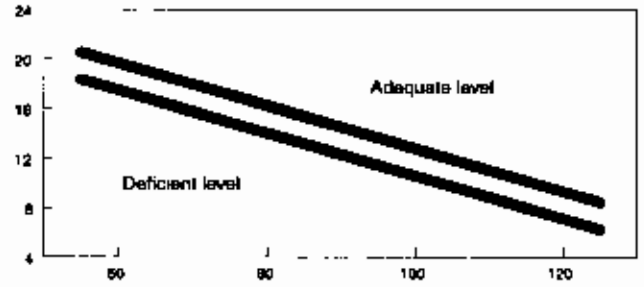
Petiole Nitrate-Nitrogen

Under sprinkler irrigation, supplemental nitrogen may be added from emergence to mid-bulking following recommendations based on nitrate-nitrogen concentrations in petioles. Ranger Russet has a relatively high petiole nitrate-N need to correspond with optimal nitrogen fertilization and yield; needs are 2,000 to 4,000 ppm nitrate-N higher than those for Russet Burbank (4). At Parma, ID, in 1993 (2), the "sufficiency nutrient range" (SNR) for Ranger Russet when nitrogen was added all preplant (Figure 2A) was from 18,000 to 21,000 ppm at 55 days after planting and drops to 6,000 to 9,000 ppm at tuber maturation. When nitrogen was split applied equally as a starter plus two or three later applications (Figure 2B), the SNR was 16,000 to 20,000 ppm at 55 days after planting and decreased to 8,000 to 11,000 ppm. With the split nitrogen application, excess levels were readily obtained resulting in lower yields and quality.

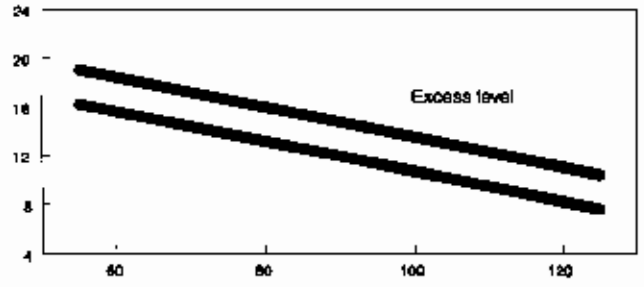
[Note. SNR is the minimum to maximum nitrate concentration that should be present in petioles at different stages of the crop's growth. Petiole nitrate levels outside this range indicate a potential loss of tuber quality such as shape defects and sugar ends.]

In a three-year (1986-1988) study at Aberdeen, ID (3), nitrogen was split applied one-quarter as starter and the rest equally every two weeks thereafter. Optimal yield was

Figure 2. Sufficient nutrient range (SNR) for nitrate-N in Ranger Rus petioles at Parma, ID, 1993
A) only preplant nitrogen application mean petiole nitrate-nitrogen (ppm)



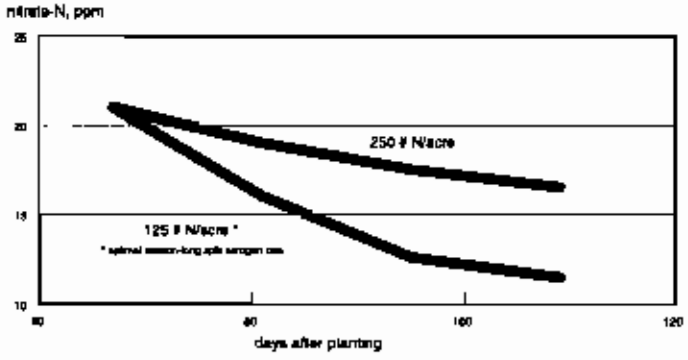
B) split nitrogen applications mean petiole nitrate-nitrogen (ppm)



(Source, reference 2)

reached with 125 lb total N/acre. The petiole nitrate-N concentration went from 21,000 ppm at 67 days after planting to 14,000 ppm at 109 days after planting (end of tuber bulking) (Figure 3). Increasing total nitrogen increased the concentration of nitrate-N in petioles but did not promote yield.

Figure 3. Nitrate-N concentration in Ranger Rus. petioles at 2 levels of nitrogen fertilization, Aberdeen, ID, 1986 to 1988.



quarter N as starter & eighth N every 2 weeks
(source, reference 3, Figures 2 & 3)

Irrigation

Ranger Russet has good drought tolerance but is susceptible to common scab when there is low soil moisture during early tuber bulking. Due to its rapid early vine growth, more water is needed earlier in the season than required for Russet Burbank. Early season shortage of water may result in misshapen tubers. Being an indeterminate variety, irrigation should be maintained to vine kill which will also lessen tuber dehydration and internal blackspot, to both of which Ranger Russet is susceptible. Pre-harvest irrigation is acceptable to lower tuber injury during harvest.

Vine Desiccation

Ranger Russet has a tendency to oversize. Therefore, vine kill is required. Being an indeterminate variety, it can be difficult to vine kill. Under good conditions, Ranger Russet is ready for desiccation at 110 to 120 days after planting or 90 to 100 days after emergence. Because of its susceptibility to blackspot bruising, care is needed during harvest to minimize injury-causing areas such as drops.

Storage

Ranger Russet has a relatively short dormancy, about 3 months. For longer storage at 40 F or above, the application of a sprout inhibitor is needed during the third month. If immature or injured tubers are stored, *Fusarium* dry rot may be a problem. Reducing sugar content is lower than in Russet Burbank and dry matter content is higher. It fries lighter than Russet Burbank out of 45 and 40 F storage. Unlike Russet Burbank, Ranger Russet is moderately resistant to sugar ends.

Table 4. Key Management Points for Ranger Russet.

vine maturity	120 days after planting
vine growth	rapid during early season
diseases	early blight, common scab
defects	blackspot injury
herbicide	tolerant to all
tubers	short dormancy, oversizes
seed	many, evenly distributed
planting	8-12 inch spacing
(processing)	4 inch deep
nitrogen	all preplant or distributed to mid-bulking, optimal total usually 150 to 180 lb/acre
petiole-N	16-21,000 ppm, 70 days post-plant 10-13,000 ppm, 100 days post-plant
irrigation	more early watering for tuber shape more later watering for blackspot
desiccation	difficult when green need to lessen oversizing
storage	excellent sugars, little sugar ends apply sprout inhibitor for processing

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INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
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Ranger Russet: Field Management: References

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