GROWING OTHER THAN THE RUSSET BURBANK

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In recent years the principal cultivar used by the Washington State potato industry has been the Russet Burbank. Most of the cultural practices known throughout the industry are those associated with production of that cultivar. There are some other cultivars that have played a role in the industry. Early in the history of the industry the White Rose cultivar and some red cultivars made up a sizable portion of the total acreage, and over time there has been a small but persistant acreage of chipping cultivars, mainly Norchip. The Norgold Russet has been and still is another cultivar with a place in the industry. However, the Washington potato industry is mainly a one cultivar industry. During recent years interest and activity in newly introduced cultivars and unnamed (numbered) clones has increased. This interest should cause everyone in the industry to ask: What do we need to know to maximize the chance of success with these new materials?

Information presented previously in Washington Potato Conference Proceedings identifies some of the areas of concern. Others have been shown by recent research efforts at Washington State University which are in part funded by the Washington State Potato Commission.

Seed tuber size and eye distribution influence the number of plants that develop in an acre of planted potatoes. Work by Iritani and others of his group has shown that cultivars such as Nooksack have fewer eyes for the same size seed tuber than Russet Burbank. This is also the case with Shepody. Table 1 shows some preliminary data on relationship of seed tuber size of some new cultivars and clones that are being considered for growing in Washington. This data is limited in size and is intended only to emphasize the fact that this is a factor that must be accounted for when considering a new cultivar. An important aspect to note is that all of the clones and cultivars have fewer eyes/tubers in the 6-8 oz size class than Russet Burbank and most of them have this same characteristic in tubers over 10 oz. in size.

When to plant and how deep to place the seed piece are two factors that each producer has usually established for himself based either on his own experience or on results of research that has been made available. With the new cultivars and numbered clones, these both need to be defined.

This Presentation is part of the Proceedings of the 1987 Washington State Potato Conference & Trade Fair.

In an attempt to help provide some information on time and depth of planting, 15 individual cultivars and clones were planted in growth chambers at 3 depths, 1, 3 and 6 inches, and held at 3 temperatures, 40°, 45° and 50°. Date of emergence and total plants emerged were recorded. Figure 1 shows the influence of planting depth. Entry No. 4 is Russet Burbank. Entry No. 1 is Norgold Russet.

The data is from only one test and is not presented to be absolute but to show that response to planting depth for some of the new material is similar to that of Russet Burbank (#4) - entries #2, 5, 17, 16, 9, 11, 6, 10 and 7. Some entries resemble more closely Norgold (#1) - entries 15, 14 and 13. There are also some entries that are not similar to either Russet (#4) or Norgold (#1) - entries 8, 3 and 12. To determine actual days to emergence for any entry at a specific depth, determine the number of days shown for that depth, i.e. entry #2 emerged from 0 depth in 40 days, from 3" in 77 days (117-40) and from 6" in 76 days (193-117).

Figure 2 shows the results of the preliminary trial for effect of temperature. As with depth, there are some entries that respond to soil temperature (intended to represent planting date) similar to Russet Burbank (#4) - entries 2, 5, 17, 16, 9, 11, 6, 10 and 7 (the same ones that are similar to Russet for depth). Some respond to soil temperature similar to Norgold (#1) - entries 12 and 3 (neither was similar to Norgold for depth). There are some entries, 15, 14, 13 and 8, that appear to be different than either Russet (#4) or Norgold (#1).

It has been acknowledged generally that cultivars and clones differed in their response to nitrogen level and time of application. With the use of petiole NO-3 nitrogen level as a nitrogen management decision-making tool, it is important to know if this parameter differs with different cultivars and clones. Figure 3 presents information on this influence. Petiole levels are reported for 2 dates (June 24 and August 1) with 3 nitrogen programs: 1) 150 lbs. preplant broadcast; 2) 150 lbs preplant broadcast plus 150 lbs. incrementally applied after planting and 3) 300 lbs. preplant broadcast. Note that all entries tended to have higher levels at both dates and with all 3 nitrogen programs than Russet Burbank at the early sampling date and at the second date with the lower N rate. This implies that these clones would have petiole levels equivalent to Russet with lower levels of applied nitrogen.

These same clones were grown under two soil moisture regimes: 1) irrigated when soil moisture reached 65% of field capacity and 2) irrigated when soil moisture reached no lower than 80% of field capacity. Effect of these treatments on petiole nitrate nitrogen is shown in Figure 4. This data shows that the nitrate level in the petioles of cultivars and clones is different depending on irrigation practices.

Although there may be conditions and cultural practices that cultivars and clones respond to differently in addition to those discussed here, these results show that considerable information needs to be available in order for the Washington State potato industry to take full advantage of the new material being developed by the cultivar development efforts currently underway.

Table 1. Average Number of Eyes of Clones and Cultivars of Different Size Seed Tubers (Preliminary data).

Clone/cultivar*	Seed Tuber Size					
	4-6 oz.		6-8 oz.		Over 100 oz.	
	Ave.	Range	Ave.	Range	Ave.	Range
A	-		11.2	8-14	-	
8	-		8.4	7-12	-	
7	-		12.4	10-16	17.0	13-21
Norgold 4	9.0	7-11	-		15.1	9-23
B	10.0	9-12	-		13.0	11-15
Russet Burbank 1	-		17.8	13-23	15.8	14-25
C	9.3	7-12	-		10.3	6-12
5	-		10.2	6-14	12.9	8-17
3	-		14.2	8-16	-	
D	-		9.8	6-12	-	
E	-		8.6	7-11	-	
13/14	-		12.6	10-16	-	

*Numbers are the same as those used for identification on Figure 1 and 2. Letters indicate unnamed clones that are not shown in these figures.

Figure 1. Number of days from planting to emergence for clones and cultivars at three planting depths. Note: to determine days subtract previous depths from total, i.e. entry #2, 40 days at 0", 77 days at 3" (117-40), 76 days at 6" (193-117).

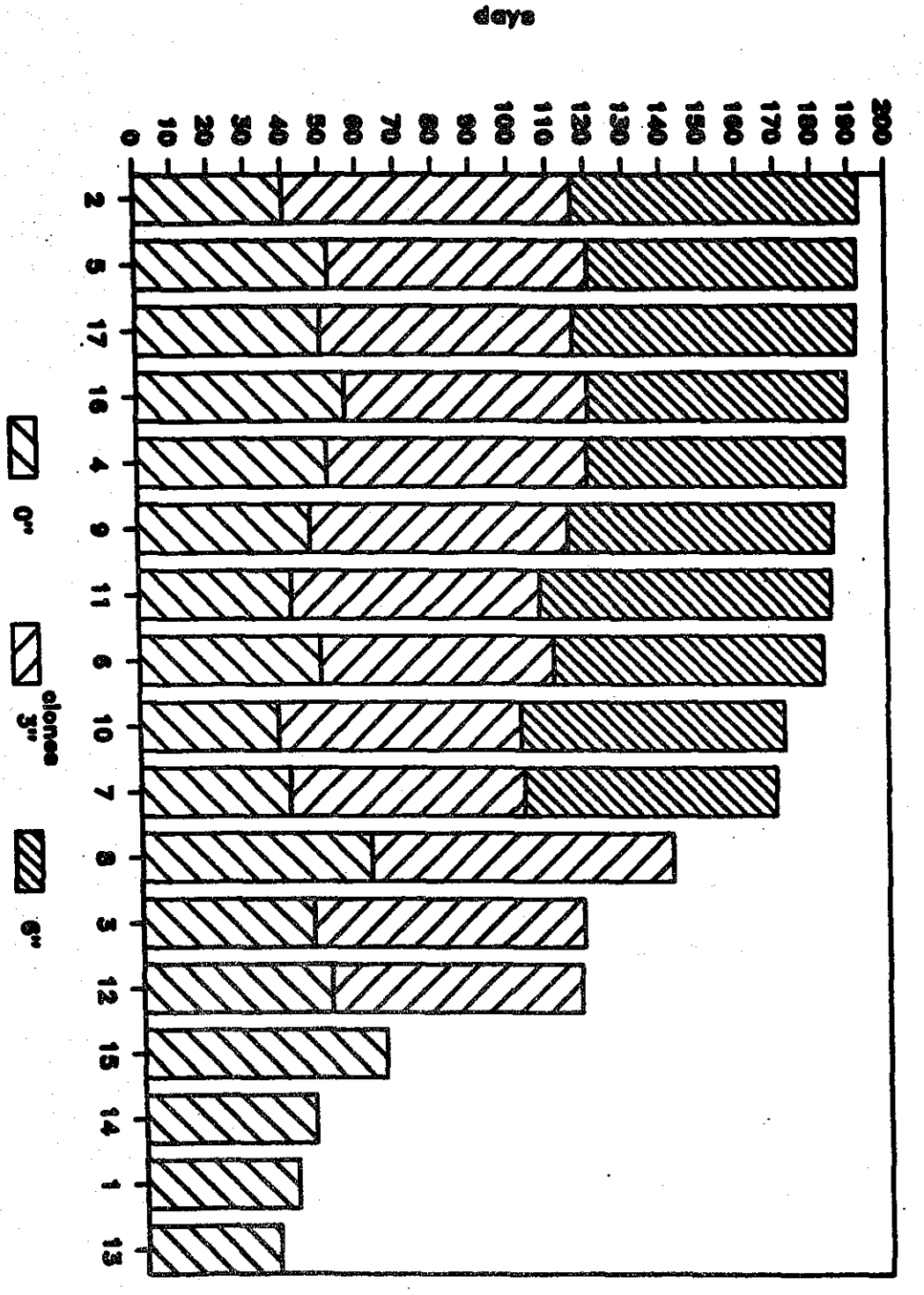

Figure 2. Number of days from planting to emergence for clones and cultivars grown at 3 temperatures. To determine days to emergence see Figure 1.

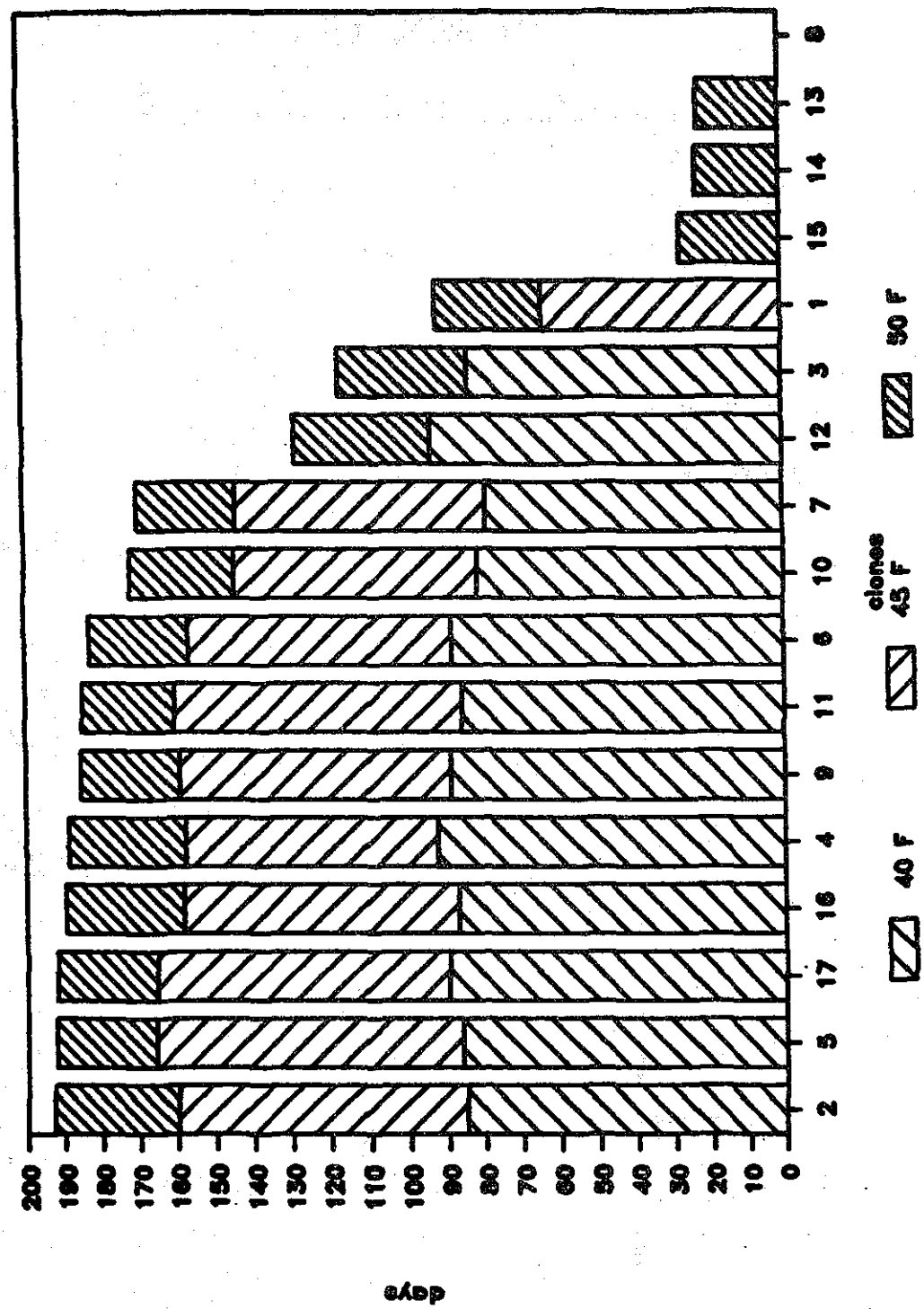

Figure 3. Influence of nitrogen level and timing and clone or cultivar on petiole nitrate nitrogen level at two sample dates.

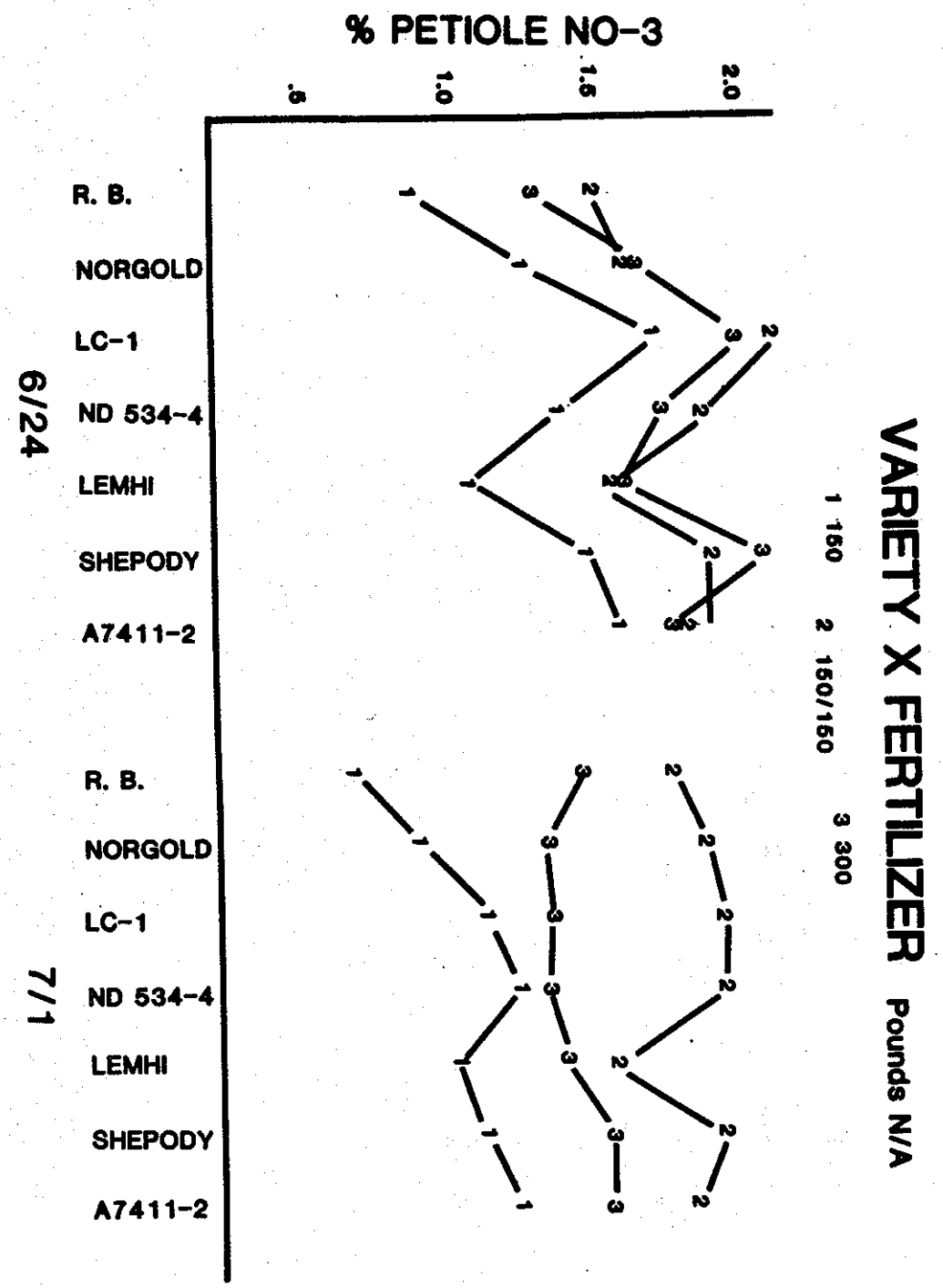

Figure 4. Influence of irrigation on nitrate nitrogen level in petioles of seven clones and cultivars.