CULTURAL PRACTICES FOR NEWER VARIETIES

David Curwen 1/

Introduction

In recent years, there has been a significant increase in the acreage planted to two newly named varieties; Snowden and Goldrush. Snowden, formerly W855, is a product of the Wisconsin breeding program and was developed by Don Kichefski. Snowden is a late maturing, round white variety. It is an excellent chipping variety having low reducing sugars and yields and specific gravity (solids) similar to Atlantic. Snowden can be chipped directly from 45 F storage over a four to six month period.. Snowden is rapidly becoming a major chipping variety in the U.S.

Goldrush, formerly ND 1538-1, was developed by Dr. Bob Johansen of North Dakota State University. It is an early maturing russet very similar to Russet Norkotah. Unlike Russet Norkotah, Goldrush has more tolerance to both scab and early dying and generally has better solids thus giving it some processing potential.. It generally does not have as nice a tuber type a Russet Norkotahs but has found significant fresh market acceptance.

Both of these varieties were tested in the Wisconsin Variety/Advance Selection trials over several years and at several locations. Such testing showed both the production and market potential for Wisconsin's growers. However, varietal evaluations do not provide information on such cultural practices as fertility requirements and spacing. Such cultural information is generated by other research. Some research has been done with both of these varieties. The following presents a summary of this research which may be helpful to growers as they fine tune practices for Snowden and Goldrush.

Snowden (W855)

A potato variety spacing trial, which included Snowden (W855), was conducted at the Hancock Agricultural Research Station in 1987 and 1988. In each year the in-row spacings treatments were 9, 12, 15 and 18 inches. The between-row spacing was held constant at 36 inches. A total of 270 lbs ac N/A (50 lbs @ planting, 220lbs as supplemental) was used in 1987. In 1988 the total nitrogen was 220 lbs ac N/A (20lbs @ planting, 200 as supplemental). All other cultural practices were in accordance with UWEX recommendations.

A significant yield response to the spacing treatments was obtained in 1987 but not in 1988. There were no significant quality responses to the spacing treatments in either year.

1/ Area Extension Horticulturist, Department of Horticulture
University of Wisconsin - Madison

The significant responses obtained in 1987 are presented in Table 1.

Table 1. Effect of in-row spacing on yield and grade of Snowden (W855) - Hancock, 1987.

Spacing (inches)	Total Yield (cwt/A)	US1A (%)	US1B (%)	Cull (%)
9	669 a 1/	87 a	6 a	7 a
12	572 b	90 ab	6 a	4 a
15	502 b	91 b	5 a	4 a
18	516 b	91 b	5 a	4 a

1/ Means having the same letter are not significantly different

The data in Table 1 indicates that the 9 inch, in-row spacing had total yields that were significantly higher than the other three spacings. However, tuber size may have been somewhat smaller. This is indicated by the US1As data which shows that the 9 inch spacing had a significantly lower percent US1As than did the 15 or 18 spacings. The difference in US1As between the 9 and 12 inch spacings was not statistically significant. The response of smaller tuber size with decreasing in-row spacing is a common one. In-row spacing had no significant affect on either the percent US1Bs or Culls.

Dr,. Richard Chase, Michigan State University, conducted trials in 1989 and 1990 which evaluated both spacing and nitrogen effects on Snowden. These trials were conducted at the Montcalm Research Farm. This farm has a heavier soil type than Hancock The data, averaged for the two years , is presented in Table 2.

Table 2. Effect of in-row spacing and nitrogen rate on yield and grade of Snowden - MSU, 1989.

Treatment	Total Yield (cwt/A)	US1A (cwt/A)	US1A (%)
Spacing (inches)			
9	444	369	83
12	420	368	88
15	411	372	91
Nitrogen (lbs/A)			
100	389	325	84
150	431	379	88
200	455	405	89

(Source: Chase - MSU)

The data in Table 2. tends to support the data obtained at Hancock. Increasing total yield was associated with decreasing in-row spacing. However, decreasing in-row spacing also reduced tuber size as reflected by the US!A (cwt/A and %) data. The nitrogen data suggests that Snowden may have a relatively high requirement for nitrogen. Increasing total and US1A (cwt/A and %) yields were associated with increasing nitrogen rates. That is the highest yield (total and US1A) were obtained with the highest rate of 200 lbs acN/A. Other Michigan studies (on farms and research stations) also indicated a nitrogen rate of 120 to 240 lbs acN/A.

The Chase study also included an economic evaluation of the spacing and nitrogen effects on Snowden yield and quality. The results showed that the highest return was from the 15 inch spacing for each of the three nitrogen rates and that the 200 lbs nitrogen rate produced the highest returns.

Considering the Wisconsin and Michigan data, it would appear that a starting point for Snowden spacing is around 12 inches. This would seem to give the best compromise between total and US1A yields. Snowden tends to set high tuber numbers and thus close in-row spacings should be used with caution. These studies would also suggest that about 200 lbs/A of supplemental nitrogen would be needed on irrigated sands.

Goldrush (ND 1538-1)

There is less cultural information for Goldrush. A cultural Profile study was conducted at the Hancock Agricultural Research Station in 1992. Goldrush was grown under two levels of irrigation (optimum and excess), three in-row spacings (9, 12, 15 inches) and three nitrogen rates (90, 180, 270 lbs ac N/A). The between-row spacing was 36 inches. The nitrogen rates were for supplemental nitrogen. About 30 lbs ac N/A was applied at planting. The supplemental nitrogen rates were split with 1/2 applied at emergence and 1/2 applied about two weeks later.

The data is presented in Table 3 (See following page). The data indicates that irrigation had no significant effect on Goldrush yield, tuber size or tuber solids. Increasing in-row spacing had no effect on total yield or tuber solids but did significantly affect tuber size. Both the 12 and 15 inch spacings resulted in more larger tubers than the 9 inch spacing. However, the % tubers over 16 ounces for the 12 and 15 inch spacings were not significantly different.

Increasing the rate of supplemental nitrogen did not significantly affect total yield of Goldrush although there was a trend toward higher yield with increasing nitrogen rate. Both tuber size and tuber solids were significantly affected. The 270 lb/A rate did result in a larger percentage of tubers over 16 ounces when compared to the 90 or 180 lb rates. But increasing the nitrogen rate above 90 lbs/A did significantly reduce tuber solids which could affect processing quality.

Based on this one year study, it would appear that the optimum spacing for Goldrush is in the range of 12 to 14 inches. With respect to nitrogen rate, 180 lbs ac N/A of supplemental nitrogen would be needed. Irrigation should provide adequate water, but not excessive.

Table 3. Effect of irrigation, in-row spacing and nitrogen rate on yield, tuber size and solids of Goldrush - Hancock, 1992

Treatment	Total Yield (cwt/A)	< 16 0z % 1/	Solids %
Irrig - Optimum	392	5.3	17.7
- Excess	388	4.3	18.0
	ns 2/	ns	ns
Spacing - 9 inch	396	2.4	17.7
- 12 inch	391	5.1	18.0
- 15 inch	394	7.1	18.0
	ns	*	ns
Nitrogen - 90 lb/A	385	3.5	18.8
- 180 lb/A	391	3.7	17.5
- 270 lb/A	394	7.2	17.1
	ns	*	*

1/ % of total yield
2/ ns = no significance, * = significance @ 5% probability