

Potato Varietal Adaptation Experiment

An experiment was established in 1963 to test the adaptation of several varieties and lines in the Central Oregon area that have appeared to have superior characteristics in screening trials in the Klamath Falls area.

The objectives of the experiment are two-fold:

1. To gain information on the yielding ability of certain varieties and lines that are reported to have exceptional yield or desirable disease resistance.
2. To determine whether the yield and agronomic performance of varieties will be similar between the Klamath Falls area and the Central Oregon area.

The trial was established on newly cleared land of the Redmond location of the Central Oregon Experiment Station. The trial was established on May 28, 1963 and conditions were generally favorable. Sprinkler irrigation was used on the land and favorable moisture conditions prevailed. It is the opinion of farmers who clear land and irrigate that during the first year of irrigation it is difficult to maintain uniform moisture in the field. The feeling is that soil under Juniper trees is almost impervious to water while soil away from the Juniper trees takes water readily. In checking the field moisture during the season, this effect may have been apparent. At least portions of the field appeared dry while other portions appeared too wet. However, the yields did not vary with the apparent discrepancies in water supply.

Seven hundred fifty pounds of 15-10-10 fertilizer was supplied to the potatoes. One-half of this rate was broadcast prior to seeding and one-half was banded two inches below and to the side of the seed pieces.

The tubers used for seed varied considerably in size. In cutting, an attempt was made to keep the seed piece size at two ounces, but this was not always possible. The condition of the tubers at cutting time varied considerably by variety--some were firm and in excellent condition, others tended to have passed their peak and were rather spongy--depending on the relative keeping quality of the particular variety.

Because of the long, frost-free season during 1963, it was necessary to use a vine killer (Sodium Arsenite) in order that the tubers would have an opportunity to mature before digging. The trial was harvested on October 16, 1963, eight days after the vine killer had been applied.

Table No. 13 indicates the varieties or lines grown, average yield, yield significance, hill stand, relative vigor, relative maturity and notes on diseases. There was no significant difference in yield between Red Pontiac, Golden Chip, A 170-9, Kennebec, A 180-26, Russet Burbank and Ona; however, there was a four ton yield difference between Red Pontiac and Russet Burbank. Red Pontiac was significantly higher yielding than the bottom two-thirds of the varieties and lines included. Diseases severely affected and undoubtedly reduced the yields of Saco, RD 175-7, F 107-3, and RD 28-29. The diseases were not positively identified by laboratory methods but by field symptoms. F 107-3 was severely affected by leaf roll; in fact, the disease was so complete that it was impossible to judge maturity. A 170-9, Saco, RD 175-7 and RD 28-29 were infested by Early Blight; however, the severity was intense on the last three entries mentioned above.

The stand per plot should have been twenty hills per plot. The harvested area was a measured area and consequently there was a slight variation from the twenty hill plot. Varieties with less than twenty hills would indicate that there were missing hills because of failure of the seed pieces to produce plants either by seed piece rots or disease in the early stages of growth. Stands may have influenced yields in several instances.

The relative vigor ratings serve to indicate that the vine growth is not necessarily associated with yield. At least, the over-all appearance isn't.

Considering the growing season of 1963, maturity was not a factor in the performance of the varieties, however with a more nearly normal year it may be that the late maturing varieties will be too late and consequently yield less when compared to the earlier maturing varieties.

As long as table stock is the principal use of Central Oregon grown potatoes and the market is based on the Russet Burbank type potato it will be difficult to substitute a variety with poorer tuber appearance. Only one entry in the nursery approached the Russet Burbank in appearance--A 180-26. Most of the varieties or lines have the more globular appearance of the cobbler type potato. It may be that some of the varieties might find use in chipping or processing but as long as the demands for Central Oregon potatoes by the processors is from small to non existant it appears that we necessarily must stay close to the Russet Burbank potato in tuber appearance and quality.

The yields in tons per acre and the stand at harvest time are shown in replicate on Appendix Table Nos. 15 and 16.

Table No. 13

Yield and Agronomic Characteristics of Eighteen Potato Varieties
or Lines Grown at the Redmond Location of the Central Oregon
Experiment Station - 1963

Variety or Line	Average Yield Tons/Acre	Significance at 5% Level (5)	Hill Stand	(4) Rel. Vigor	Relative Maturity	Dis- eases
Red Pontiac	23.7		19.0	Poor	Med.	
Golden Chip	22.8		19.7	Good	Late	
A 170-9	22.3		21.7	Poor	Med.	(2)
Kennebec	20.3		19.0	Ave.	Med-late	
A 180-26	19.8		16.3	Ave.	Med.	(3)
Russet Burbank	19.7		19.7	Ave.	Med-late	
Ona	19.6		17.7	Ave.	Early-med.	
A 180-2	18.8		20.7	Good	Late	
B 4848-1	18.8		21.0	Good	Med-late	
Merrimack	18.5		16.7	Ave.	Late	
A 177-54	18.4		20.0	Good	Med-late	(3)
A 501-13	18.2		20.3	Good	Late	
Shoshone	18.1		17.7	Poor	Med.	
Superior	17.9		19.0	Poor	Early-med.	
Saco	17.9		16.5	Poor	Late	(2)
RD 175-7	15.4		17.7	Ave.	Med-late	(2)
F 107-3	12.6		18.0	Poor	-	(1)
RD 28-29	11.6		16.3	Ave.	Late	(2)
Coefficient of Variation = 12.92%						

- (1) Very heavy infestation of a disease with the apparent symptoms of Leaf Roll.
- (2) Saco, RD 175-7, RD 28-29 heavy infestation of a disease with the apparent symptoms of Early Blight; A 170-9 was less severely affected.
- (3) A trace of Giant Hill.
- (4) Relative Vigor of top growth.
- (5) Any two varieties or lines covered by the same line are not significantly different in yield.

Planted May 28, 1963

Sprayed with Sodium Arsenite (vine killer) October 8, 1963

Harvested October 16, 1963

Appendix Table No. 15

Potato Yield in Tons Per Acre for Potato Varieties Grown at the Redmond Location in 1963. Yields are Shown by Replicate and Average of Three Replications

Variety or Line	Yield of Potatoes in Tons Per Acre by Replicate			Average
	I	II	III	
A 180-2	17.97	14.88	23.41	18.8
A 501-13	15.03	19.78	19.78	18.2
B 4848-1	17.79	20.51	18.24	18.8
F 107-3	11.07	13.25	13.43	12.6
RD 28-29	12.71	12.52	9.43	11.6
RD 175-7	12.80	14.34	19.06	15.4
A 170-9	18.06	20.15	28.59	22.3
A 175-7	17.61	16.15	20.51	18.1
A 177-54	16.70	18.15	20.24	18.4
A 180-26	19.15	17.97	22.14	19.8
Red Pontiac	20.15	27.95	22.96	23.7
Kennebec	18.24	19.87	22.77*	20.3
Golden Chip	19.42	22.42	26.59	22.8
Russet Burbank	18.42	17.42	23.23	19.7
Superior	15.34	16.15	22.14	17.9
Ona	15.24	21.42	22.14	19.6
Saco	15.73*	15.42	22.51	17.9
Merrimack	13.79	21.60	20.24	18.5

*Corrected Yields

Appendix Table No. 16

Stand at Harvest Time of Potato Varieties Grown on Redmond Location.
Stand Presented by Replicate and Average of Three Replications.

Variety or Line	1963 Potato Plant Stand By Replicate			Average
	I	II	III	
	A 180-2	22	20	
A 501-13	22	22	17	20.3
B 4848-1	22	22	19	21
F 107-3	16	20	18	18
RD 28-29	14	18	17	16.3
RD 175-7	16	17	17	16.7
A 170-9	21	22	22	21.7
A 175-7	18	15	20	17.7
A 177-54	19	19	22	20
A 180-26	18	15	15	16.3
Red Pontiac	17	20	20	19
Kennebec	19	19	19	19
Golden Chip	18	21	20	19.7
Russet Burbank	20	18	21	19.7
Superior	20	17	20	19
Ona	18	17	18	17.7
Saco	-	16	17	16.5
Merrimack	14	17	19	16.7