PRODUCING POTATOES IN WASHINGTON

by
Dr. Robert Kunkel & Dr. Robert Thornton

At one time it was believed that the high per acre potato yields obtained in Washington were the result of superb climatic conditions coupled with the use of good cultural practices. However, areas with climates considered much less favorable for potato production than Washington have reported yields from experimental potato plots almost equal to the best experimental plot yields reported in Washington such as 800 cwt/acre in Idaho, 900 in Texas, 900 in Wisconsin, and 1200 in the Netherlands. Occasionally, experimental yields in Washington have exceeded 1300 cwt/acre.

It will only be a matter of time until commercial yields in these areas approach experimental yields as has been the case in Washington. Each year the number of commercial farms reporting 800 cwt/acre increases. A field which averages 800 cwt/acre, has portions of the field producing at a rate higher than the average - say 1000 cwt/acre - and other parts of the field at below average - say 600 cwt/acre. The "name of the game" now and in the future is "high yields of high quality" potatoes. This means all areas in a field must produce to the upper limits now reported.

To aid Washington potato growers in capitalizing on Washington's favorable climate of: 1. long, frost-free periods, 2. high air temperatures, 3. intense light, 4. long days, 5. low humidity, and 6. constant breezes; the following was outlined.

Factors of Growth

1. Varieties:

By far, the predominant variety is the Russet Burbank. Kennebec is grown for early season processing and Norgold Russet for fresh market. Some new varieties such as Butte and Nooksack are worthy of limited trial.

2. Seed quality:

The best seed obtainable is the best investment as it is most likely to be free of devastating diseases such as ring rot, late blight, blackleg, potato leaf roll virus, etc.

3. Seed piece size:

Generally, the larger the seed piece (up to 2 oz in size) the higher the yield potential. Actual yield will depend on adequate water and nutrients being available for the increase in plant population which often accompanies an increase in seed piece size.

4. Number of plants:

The number of good pieces planted is easy to determine although this is not a good indication of the number of plants per acre that need to be supplied with nutrients. If soil P and K levels are kept high, after emergence, population can be determined by counting and nitrogen applied according to the need of the population present.

5. Moisture supply:

Potato roots seldom grow deeper than 12 inches. Large plants require more water. Little water is required early in the growth though young tubers are extremely sensitive to water stress. During 90 to 100 F days, it is almost impossible to get the soil too wet as long

as water-logging is avoided. Late in the growing season over irrigation can result in tuber rots in the field and storage and low specific gravity potatoes. Knowing the water holding capacity of the soil and the daily evapotranspiration losses is a good basis for determining when and how much to irrigate.

6. Mineral nutrients:

Generally only N, P, K, and Zn need to be applied to Columbia Basin soils. Sulfur may need to be added when river water is not used for irrigation. The amount of nutrients required is dependent upon the yield. The nutritional reserves in the soil as well as the amount needed as fertilizer should be considered. Of the fertilizer elements applied nitrogen generally has the greatest effect on yield. Too little or too much nitrogen can reduce tuber yield, the amount of nitrogen required is determined by the length of time between planting and harvest.

7. Soil compaction:

Potatoes grow best in light textured, loose, friable soils. Loosening the entire soil area by plowing, disking, and chiseling may not produce higher yields than planting directly into sod, stubble or bare ground that has been tilled only underneath the plant row before or at planting. Several innovations for reduced tillage planting of potatoes have been developed and seem worthy of trial. Some methods are more conservative of energy and more efficient in stopping wind erosion.

8. Pests:

Potato pests include insects, diseases and weeds. Though not always present, their control must be planned for and their presence detected before they result in reduced yield, harvest interference and/or storage problems. Anyone of these pests or combination of pests can make a potato crop a financial loss.

9. Days Grown:

Potatoes are harvested 90-180 days after planting. The largest yields are usually associated with the longer growing season. But, this is not always the case, suggesting that there is still much to be learned about the efficiency of potato production. Yields of 400 cwt/acre in 100 days and 800 cwt/acre in 180 days are possible and known to occur.

10. Timeliness of Operations:

There is a "best time" for cutting and planting seed, weed control, starting and stopping the irrigation and harvesting and storing tubers. The climatic conditions for doubling the average Columbia Basin yield of 460 cwt/acre are available. Those factors that limit production often can be applied to the soil or the plant and the actual yield will depend upon doing what should be done when it needs to be done.