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C.W. Waid, Horticulture
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SUGGESTIONS FOR GROWING POTATOES.

BY C. W. WAID, EXTENSION SPECIALIST, HORTICULTURAL DEPARTMENT, MICHIGAN AGRICULTURAL COLLEGE.

Soil.

More attention should be given to the selection of the soil for the growing of potatoes than for many other cultivated crops. The ideal soil is a sandy loam or clay loam. A heavy clay or a very light sandy soil is not often satisfactory. The previous treatment of the soil has much to do with the suitability or lack of it for the potato crop. A soil which has been well managed and which is in a good state of cultivation and is fertile is very desirable. A soil in which a good crop of clover grew the previous season will usually be very satisfactory. A heavy grass sod may do but it may be badly infested with white grubs or wire worms which would make it undesirable. A quack grass sod should not be used if a better soil is available. Land which has been cultivated the previous season and which was left bare through the winter will not, as a general thing, produce a very good yield of potatoes.

Preparing the Land.

If the land produced clover or grass the previous season and was plowed in the fall, it will be desirable. If the land was not fall-plowed and is in clover or rye, these crops should be permitted to grow as much as possible and yet not be allowed to rob the soil of moisture before the plowing is done.

If there is an abundance of rainfall, the plowing may be delayed with safety much later than when the rainfall is not abundant. On the heavy soils, the plowing should not be delayed until the soil becomes hard. Disking before plowing as well as after will help to make a desirable seed bed. When seed potatoes are expensive, a grower cannot afford to fail to make a thorough preparation of the seedbed.

Fertilizers.

There are two kinds of fertilizers, stable or barnyard manure and commercial fertilizer. Barnyard manure is the best form of fertilizer for potatoes. If the land grew a crop of clover the previous season and was plowed either in the fall or spring without the application of manure, it may produce a good crop of potatoes without manure. However, the chances of growing a satisfactory crop will be increased if manure is used at the rate of eight or ten tons to each acre. Unless the manure is to be used on a very heavy soil, it should be applied before plowing rather than afterward as a top dressing. Only well rotted manure should be used as a top dressing.

If the supply of manure is not sufficient or it is not advisable to apply manure, commercial fertilizer may be used to supply needed plant food. Commercial fertilizers are also frequently used in addition to the manure. They may be used with much assurance of profit on most potato soils. The results depend very largely upon the method of application. Under present conditions, certain commercial fertilizers are too expensive to warrant their general use for potatoes.

However, the following fertilizers are available at reasonable prices and are desirable to use for potatoes: Acid phosphate, preferably the 16 percent brand, and a ready mixed fertilizer made up of 2 to 4 percent nitrogen and 8 to 12 percent phosphoric acid. These may be purchased of any fertilizer dealer ready to apply.

For clover sod land from 250 to 500 pounds of acid phosphate per acre may be used. For other soils, an equal amount of the ready mixed fertilizer containing both nitrogen and phosphoric acid may be preferable to the acid phosphate.

To get the best results from the fertilizers, they should be mixed with the moist soil. In field operations this can be done by applying the fertilizer with a potato planter or grain drill, having a fertilizer attachment. If such a tool is not available, the fertilizer may be applied by hand. If furrows or hills are made in which to plant the potatoes, a limited amount of the fertilizer, not over 250 pounds to the acre, may be distributed in these. If more than this amount is used, the balance should be scattered evenly over the entire area to be planted and either cultivated or raked into the moist soil. When the fertilizer is applied in the furrow or hills, it should be thoroughly mixed with the soil as there is danger of injury to the eyes on the seed pieces or to the sprouts if this is not done.

Varieties.

Early.—Quick Lunch is a very early maturing potato but not a very good producing variety. It is suitable for planting in the garden when earliness is a quality especially desired. Early Ohio is nearly as early as Quick Lunch and somewhat more productive. It is of good quality, well suited to the garden and is used as a commercial variety for very early cropping. Irish Cobbler is a few days later than Early Ohio. A white skinned variety. More productive than Early Ohio. A popular market sort.

Late.—The Rural Group of varieties is grown more commonly in Michigan than those of any other group. The Sir Walter Raleigh, Carman No. 3 and Rural New Yorker No. 2 are the leading varieties of this group. The Russet Rural or Late Petoskey is also a very desirable market variety in this state. Several varieties of the Green Mountain group are popular in sections where severe drouths are infrequent during August or September. The Green Mountain, Delaware, Vermont Gold Coin and State of Maine are the leading varieties of this group.

Seed Potatoes.

The kind to use: First class seed should be free from varietal mixtures, true to type and practically free from disease.

Large seed is more likely to be free from certain diseases than small seed. Potatoes the size of a medium sized hen's egg will be satisfactory for seed if taken from healthy productive hills. If potatoes which are much smaller than a hen's egg are used for seed, the yield will not be as heavy as when the seed pieces are large and the smaller the seed the greater the reduction in yield. Potato parings or eyes with a very small amount of flesh attached rarely give a satisfactory crop and then only when the soil and weather conditions are ideal. To insure a successful crop under the variable and often adverse conditions with which most growers are obliged to contend, the best seed obtainable is none too good.

How to cut the seed: Potatoes planted whole will be less likely to rot in cold, wet soil than cut seed. Whole seed will also give a better stand on sandy soil than cut seed if the planting is done during hot, dry weather. When large potatoes are cut for seed, a common practice is to leave at least two eyes on each seed piece. The potato plant is dependent upon the seed piece for moisture and plant food for some time after it starts to grow or until a root system has developed. Therefore, the size of the seed piece should be sufficient to give the young plant a good start.

Potatoes large enough to make two pieces should be halved through the seed end. The seed end is the one having the largest number of eyes. When large enough for three pieces, cut one from the stem end about one-third of the length from the stem and divide the remainder of the tuber in halves through the seed end. Four pieces may be made from a short round tuber by quartering through the seed and stem ends. When the tuber is longer than thick, it should be cut lengthwise and then transversely, making four blocky pieces. The pieces taken from the stem end should be somewhat larger than those from the seed end.

Treating Seed Potatoes for Scab and Black Scurf (Rhizoctonia).

It is always well to treat the potatoes that are to be planted to destroy certain undesirable diseases, especially Scab and Black Scurf. Where there is little or no evidence of Black Scurf, the dormant stage of which may be seen on the skin of the tubers in the form of small brownish, or when wet, nearly black spots, the tubers should be soaked $1\frac{1}{2}$ to 2 hours in a solution of formaldehyde, forty per cent, used at the

rate of 1 pound or 1 pint to 30 gallons of water. This will destroy the disease known as Scab.

If there is evidence of the Black Scurf, soak the uncut tubers in a solution of corrosive sublimate (bichloride of mercury), using four ounces in four gallons of hot water and when this is dissolved, add enough water to make 30 gallons. The seed is soaked in this for 1½ hours and no longer. Use only wooden vessels for this material.

Corrosive sublimate is a deadly poison and should be kept away from children and livestock. Do not use treated potatoes for eating purposes.

When and How to Treat.

The potatoes may be treated with either material several weeks, if desired, before planting if care is taken not to reinfest the tubers by placing them in used sacks or crates which have not been disinfected. Some growers prefer to treat just before planting. The potatoes should be treated before the seed is cut.

When only a few bushels of potatoes are to be treated they may be placed in gunny sacks and submerged in a barrel from which the head has been removed.

When large quantities are to be treated, a tank should be provided for the purpose. The tank should be wide enough to allow one or two rows of potato crates to be placed in it side by side and deep enough so the potatoes, crates and all can be submerged. It may be made any length desired. As soon as the potatoes are treated, it is a good plan to submerge them in clear water or pour water over them to prevent further action of the material with which they were treated. If they are to be kept some time before they are planted, they should be spread out and dried.

Distance of Planting.

On the lighter, less fertile soils, potatoes are planted, as a rule, thirty to thirty-six inches each way. Rowing both ways enables the grower to cultivate both ways. This is an advantage when it is necessary to control bad weeds or grass, such as quack grass. However, by employing the right method of cultivation (see Cultivation) drilled potatoes may be kept clean without any hand work being necessary.

On the heavier soils, the more common practice is to space the rows 32 to 36 inches apart and the hills 12 to 15 inches apart in the rows. The more fertile the soil, the closer should the potatoes be planted. Early potatoes can be planted closer than late potatoes. Horse planters do not check-row the potatoes but they can be set to plant different distances in the rows.

Cultivation.

In field operations, a spiketooth harrow is the best tool to do the cultivating with until the potatoes are high enough to prevent its use. Beginning a few days after the planting is done and continuing every four or five days until the plants are two or three inches high, the

harrow should be run one way and then the other across the field. If there is danger of disturbing the tubers or pulling out the young plants, the teeth of the harrow may be slanted. A garden rake is used for the same purpose on small patches of potatoes. If this work is done thoroughly there will be little or no handwork necessary throughout the season, providing the later cultivations are what they should be. As soon as the potatoes are high enough so that the rows show up well, the cultivator should be started. The first cultivation should be deep and close to the hills or rows. Each cultivation after the first should be somewhat more shallow than the preceding until toward the last of the season, when only the upper inch or two of the soil should be disturbed. Much damage is frequently done by deep late cultivation of potatoes. A one-horse plank drag made just wide enough to work nicely between the rows is an excellent tool to use for the last few cultivations in the potato field. Such a tool may be used after the potato tops are large and spreading without danger of injury either to the tops or roots.

Potato Spraying.

Bugs: To control the Colorado beetles (common potato bugs) in field operations use $\frac{1}{2}$ to 1 pound of Paris green to 50 gallons of water or arsenate of lead at the rate of 3 pounds of paste or $1\frac{1}{2}$ pounds of powder to 50 gallons of water. The poison should be thoroughly mixed in a small amount of water before adding the larger quantity of water.

It is frequently more convenient, especially on small areas, to use the poison in the powdered form. When so applied it should be diluted with hydrated or air-slaked lime, landplaster or flour. The amount of diluent recommended varies from five to twenty pounds to each pound of the poison. The Paris green will stand more diluting than the arsenate of lead. The Paris green is quicker to act than the arsenate of lead but the lead will adhere better to the foliage and is less likely to burn the leaves.

To be effective the poison should be applied as soon after the beetles are hatched as possible. Delay in making the applications means greater difficulty in poisoning the bugs and more damage to the foliage from the feeding of the larvae.

The applications may be made by means of sprayers or dusting machines. The dust form of poison may be applied through coarse cloth or mosquito netting doubled. One quick jerk over each plant will be sufficient. The dusting may be done most effectively when the foliage is moist.

Diseases: The foliage diseases such as early and late blight are preventable. The material used for this purpose is a combination of blue vitriol (copper sulphate), fresh stone or hydrated lime and water. This material is called Bordeaux. It should be used on potatoes at the rate of four pounds of vitriol, four pounds of stone lime or five pounds of hydrated lime to fifty gallons of water. A film of Bordeaux spread over the foliage protects it against an attack of the blight spores. Thus to be effective the foliage must be covered with Bordeaux before the blight gets a start on the leaves and it must be kept covered with Bordeaux

throughout the season. Bordeaux can be combined with Paris green and arsenate of lead. The applications of Bordeaux should begin when the plants are five or six inches tall. The first application can often be made at a time when it is necessary to spray to control potato bugs. Five to seven applications of Bordeaux are usually necessary during the season. More frequent spraying should be done during a wet than is necessary in a dry season.

For directions as to the preparation of Bordeaux, write to the Michigan Agricultural College.



