

20-7
24-82

FILE COPY
DO NOT REMOVE

BETTER POTATOES FOR MICHIGAN



Reduce hollow heart by closer planting.

MICHIGAN STATE COLLEGE
Of Agriculture and Applied Science

EXTENSION DIVISION
R. J. Baldwin, Director

24-32

BETTER PLANNING FOR
LIVING

BETTER POTATOES FOR MICHIGAN

H. C. MOORE

Michigan potato growers can increase their profits by growing better quality potatoes and by growing more potatoes to the acre. Potatoes of high quality sell the most readily and command the highest prices. Increased yields per acre lower the production costs per bushel.

The need for producing better quality potatoes is urgent. Many growers suffer serious financial loss each year by producing potatoes of poor market quality. Markets throughout the country are demanding potatoes of high quality. They want sound, healthy stock that is medium in size, smooth, of good shape and bright color, and this is free from blemishes and mechanical injuries.

The purpose of this bulletin is to emphasize the factors that are essential in the production of better potatoes and better yields.

Soil Requirements for Better Quality Potatoes

I. If possible, grow potatoes on sandy loam, gravelly loam, or silt loam soils. Light loamy soils produce potatoes of bright color and good eating quality.

Potatoes grown on heavy stiff soils are likely to be dark skinned and of poor type.

II. Plant on well drained soil that is well supplied with organic matter.

III. Alfalfa, sweet clover, or red clover are recommended as the best crops to precede the potatoes in the rotation. They add to the fertility of the soil and increase its moisture holding capacity.

IV. Avoid serious injury from wire worms, and white grubs by planting potatoes on alfalfa, sweet clover, or red clover sod. Do not plant on timothy or other grass sods that are often infested with wire worms and grubs.

V. Do not plant potatoes more often than once in four or five years on the same piece of ground. A long rotation will aid in producing potatoes clean from scab, scurf and other diseases.

How to Fit the Seed Bed

I. Plow in the fall or early in the spring. Late plowing of the seed bed is often responsible for poor yields.

II. Plow as deep as possible without turning up the sub-soil.

III. Use a disc or spring tooth harrow early in the spring and make the seed bed deep and mellow. Before the potatoes are planted, kill weeds and grass and maintain a soil mulch by frequent tillage with a spike tooth or a spring tooth harrow.

The Use of Stable Manure and Lime

I. Apply stable manure during the summer, fall, or winter previous to planting potatoes. Fresh stable manure applied late in the spring may promote the development of scab.

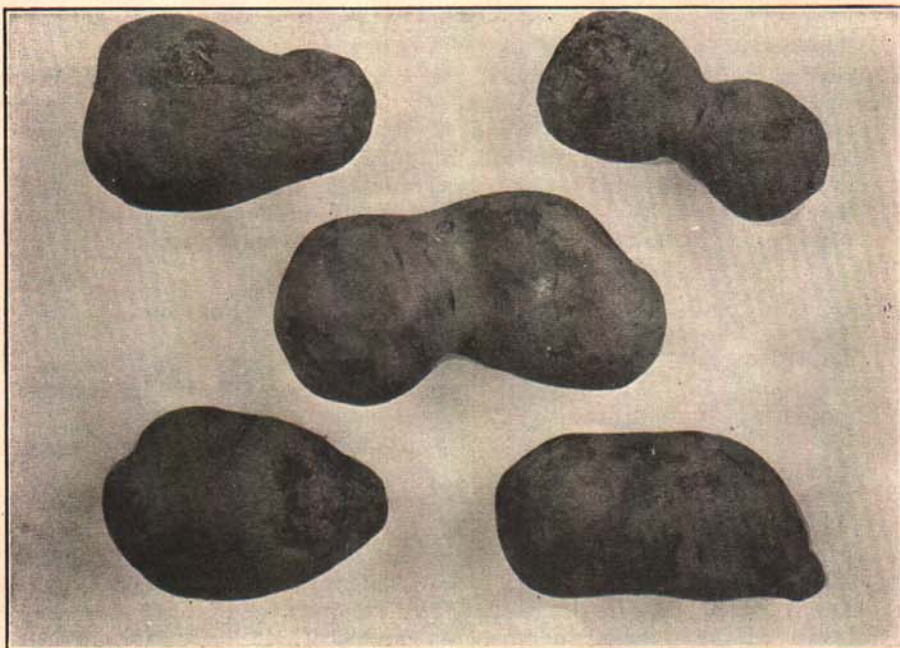


Fig. 2.—Ill-shaped potatoes are often the result of planting poor seed.

II. Apply stable manure as a top dressing at the rate of 6 to 10 loads per acre. Manure should be uniformly distributed. Do not place it in the row where it will come in contact with the seed pieces or the growing tubers.

III. The potato crop is tolerant of acid soil. Do not apply lime shortly before the potatoes are planted, as it may increase the injury from scab. Apply lime just previous to the sowing of alfalfa or clover. The usual rate of application is two tons ground limestone, or six loads or more of marl or one and one-half tons of hydrated lime per acre.

Points on the Use of Commercial Fertilizer

I. Use a high analysis fertilizer. A fertilizer analyzing three per cent nitrogen; 12 per cent phosphoric acid, and four per cent potash, known as a 3-12-4 fertilizer is a satisfactory one for light loamy soils. The rate of application should be approximately 600 pounds per acre. For heavier soils well supplied with organic matter, 400 to 600 pounds per acre of 16 per cent acid phosphate is recommended.

II. Commercial fertilizers may be applied broadcast or in the furrow, just before or at time of planting. They should be evenly distributed and worked well into the moist soil.

III. If applied in the furrow, use care that the fertilizer does not come into contact with the seed pieces, since it may injure the sprouts and cause a poor stand.

Plant Standard Varieties

I. The leading late varieties in Michigan are Russet Rural, White Rural, and Green Mountain.

The leading early variety is the Irish Cobbler.

II. The Russet Rural is recommended for sandy loam or gravelly loam types of soil.

III. The White Rural is recommended for clay loam or other heavy types of soil.

IV. The Russet Rural and the White Rural withstand hot, dry weather conditions better than does the Green Mountain.

V. The Green Mountain is a favorite late variety for many sections in the Upper Peninsula where the growing seasons are generally cool with ample rainfall. It is not recommended for sections where droughts are of common occurrence.

VI. The Irish Cobbler is one of the best varieties for early market. Profitable yields with this variety are often dependent upon the following factors:

1. Planting of high quality seed. (Certified Seed)
2. Planting on fertile, well prepared soil.
3. Spraying thoroughly with bordeaux mixture.

Plant Certified Seed

The planting of inferior seed is largely responsible for crops of poor quality and poor yield.

I. Plant Michigan certified seed. This seed is grown under the supervision of the Michigan State College and is certified by the Michigan Crop Improvement Association. It is practically free from disease, is true to name, and is produced from hill selected stock.

II. In 1300 tests, certified seed has averaged 48 bushels more per acre than non-certified or ordinary seed. Crops from certified seed average approximately 20 per cent better in market quality than crops from ordinary seed.

III. Certified seed will help a community to build up a reputation for the production of high quality potatoes. Whenever practicable, buy certified seed in car load lots by pooling orders with the local farm bureau, seed dealer, or other agency.



Fig. 3.—Plant certified seed and grow better potatoes.

IV. Certified seed of Michigan Standard Varieties can be purchased from the Michigan Potato Growers Exchange, Cadillac, Michigan.

Sources of certified seed and detailed information on the Seed Potato Inspection Service can be had from the farm crops department, Michigan State College, East Lansing, Michigan.

Treat the Seed With Corrosive Sublimate

Scab, black scurf, and black leg are three diseases that often seriously injure the market quality of potatoes or reduce the yields. They

can be controlled to a large extent by soaking the seed for 30 minutes in a corrosive sublimate solution, the strength of which is four ounces of corrosive sublimate to 30 gallons of water. The following precautions should be observed.

I. Corrosive sublimate is a deadly internal **Poison**. Keep it out of the way of livestock or children. Do not use treated potatoes for eating purposes.

II. Treat the seed while it is dormant and before it is cut.

III. Corrosive sublimate corrodes metals. Use wooden barrels or tanks.

IV. Dissolve the four ounces of corrosive sublimate in a quart or so of hot water before adding it to the 30 gallons of cold water.

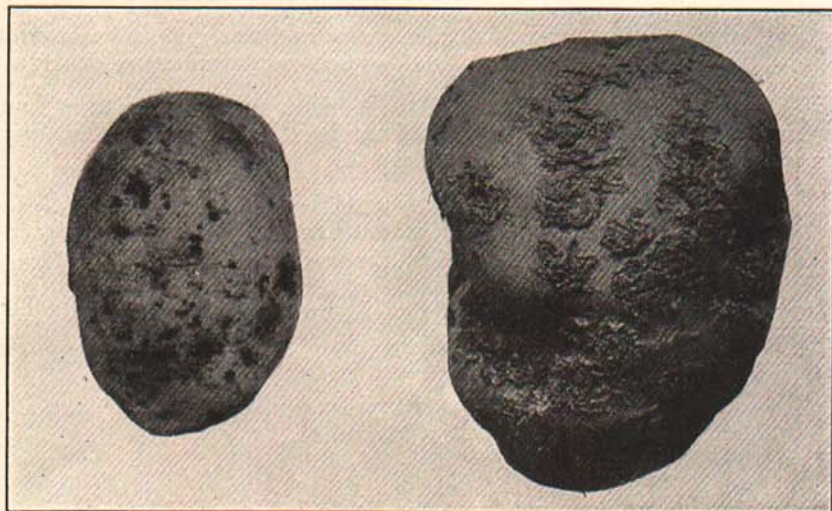


Fig. 4.—Control scab and black scurf. Treat the seed with corrosive sublimate.

V. The corrosive sublimate solution loses its strength with use. Add one ounce of corrosive sublimate dissolved in one quart of hot water for each 30 gallons of liquid after each second batch of potatoes has been treated. After six batches of potatoes have been treated discard the solution and make up a fresh one.

VI. When the potatoes are removed from the solution spread them out in a cool place so they will dry quickly.

Cutting the Seed for a Good Vigorous Stand

I. Cut the seed into blocky pieces that average one and one-half to two ounces in weight. Each seed piece should have at least two strong eyes.

- II. Cut the seed just previous to planting.
- III. Discard potatoes that show discoloration of the flesh.
- IV. Do not leave cut seed in piles or in bags as it is likely to heat and the sprouts will be injured. Keep cut seed in a cool place.

Planting Hints for Improving Market Quality and Yields

I. When grown for early market, early varieties like Irish Cobbler are generally planted as soon as the soil can be put in good condition and as soon as danger from severe frost is past.

II. Late varieties like Russet Rural and White Rural require approximately 120 days to mature a crop. Plant in time so that the crop will mature before the average date of the first killing frost in autumn. Most of the late crop is planted between May 15th and June 15th. Immature potatoes bruise easily and are generally of dark color and poor quality. The market does not want immature stock.

III. Plant the seed pieces three to four inches deep so they will be in cool moist soil and so they will not be disturbed by subsequent tillage with a spike tooth harrow or weeder.

IV. Reduce hollow heart and oversized rough potatoes by closer planting. On fertile soils, the best results are generally obtained by planting in rows 36 inches apart with the hills 12 to 18 inches apart in the row.

Planting in check rows favors the development of hollow heart.

Hollow heart is a serious defect and is responsible for the rejection of many potatoes on the markets.

V. From 15 to 20 bushels of seed are required to plant an acre when the spacing of the hills is 36 x 18 inches.

Early Cultivation is Important

I. Use a spike tooth or a spring tooth harrow lengthwise of the rows several times before the plants are up. This is important in controlling weeds and grass.

II. The first cultivation between the rows should be made when the plants are well above ground. This cultivation should be deep. Later cultivations should be shallow to prevent root injury.

III. Practice level cultivation. At the last cultivation, some soil may be thrown over the row, to prevent late growth of weeds and grass, and to protect potatoes near the surface of the soil from sun and frost injury.

IV. Cultivation should ordinarily cease after the plants are in bloom and the tubers have set.

Bordeaux Mixture Increases Yields and Improves Quality

Protect the plants from leaf-hoppers, flea beetles, early blight, and late blight by thorough spraying with bordeaux mixture.

I. Make the first spray application when the plants are four to six inches high. Repeat the application at intervals of ten days to two weeks throughout the season. Five applications are usually required.

II. Use a sprayer that can maintain a pressure of 200 pounds or more. Use three nozzles to each row so both the upper and lower surfaces of the leaves will be covered with spray. It will require



Fig. 5.—Protect the plants from leaf-hoppers, early blight and late blight. Spray with bordeaux mixture.

approximately 100 gallons of bordeaux mixture per acre for each application.

III. For the control of potato bugs, add one and one-half pounds of calcium arsenate to every 50 gallons of bordeaux mixture.

How to Make Bordeaux Mixture

I. Dissolve 50 pounds of copper sulphate in 50 gallons of water. Suspend the copper sulphate crystals in a burlap bag just under the surface of the water. It will require several hours for them to dissolve.

II. In a separate vessel slake 50 pounds of stone lime or 75 pounds of hydrated lime and add water to make 50 gallons.

III. These are stock solutions and will keep in good condition for several weeks if they are kept covered to prevent evaporation of water and will be sufficient to make 625 gallons of bordeaux mixture.

IV. When ready to spray stir each of the stock solutions vigorously. Fill the spray tank (100 gallon tank) half full of water. Pour into the spray tank eight gallons of the lime solution and stir thoroughly. Add water until the tank is about three-fourths full. Then add eight gallons of the copper sulphate solution. Stir thoroughly and add enough water to fill the tank. Do not pour together the strong stock solutions.

Harvesting Suggestions to Insure Better Quality

Field frost and mechanical injury seriously reduce the market quality of potatoes.

More care in digging the crop will lessen these troubles and will bring the grower greater return for his potatoes.

Cautions

I. Do not delay harvesting operations until late in the season when there is always a risk of severe frosts.

II. Do not place field frosted stock in permanent storage. Place it in temporary pits to allow frosted potatoes to break down.

III. Use care in digging to prevent serious mechanical injuries. Run the plow of the digging machine deep enough to prevent cutting the potatoes and to carry up enough soil over the elevator chains so the potatoes will not be bruised by riding on the bare chains.

IV. Drive the machine slowly.

V. If the crop is dug with a fork, use special care not to puncture the potatoes with the fork tines.

VI. If possible, dig when the soil is comparatively dry and the weather is clear.

VII. After the potatoes are dug, let them lie on the ground an hour or more so they will dry and their skins toughen.

VIII. Hauling the potatoes to storage in crates instead of in bulk will greatly lessen the amount of mechanical injury.

Essential Points in Storage

I. Store in a frost proof cellar or warehouse.

II. Store only sound potatoes that are free from frost injury and that are practically free from dirt.

III. Do not unnecessarily bruise the potatoes when putting them in storage. Use gently sloping chutes that are padded with burlap to ease the fall of the potatoes into the bin.

IV. Provide the potato bins with ventilation flues placed at frequent intervals so that no potatoes will be more than five feet from a supply of fresh air.

V. During the first few weeks of storage reduce the temperature of the storage cellar by keeping doors and windows open at night. Provide for a free circulation of air.

VI. After the potatoes have gone through the sweating process, maintain a uniform temperature in the cellar of 36° to 40° Fahrenheit.

VII. Keep the cellar dark to prevent the potatoes from turning green.

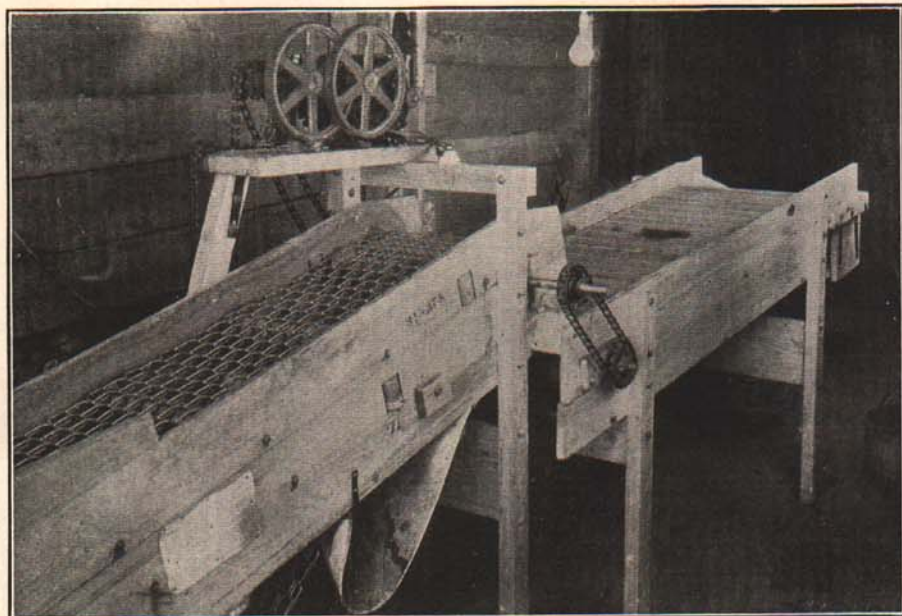


Fig. 6.—Effective grading can be done with this type of grader—equipped with a hand sorting table of the roller type. Good light is essential for good grading.

More Care in Grading is Necessary

I. Use the most improved types of grading machines. Have a good light over the machine so that defects in the potatoes can be seen. Do not rush the work.

II. Mechanical graders sort the potatoes for size only. Ill-shaped, rough, scabby potatoes, and those which are cut or which are fork punctured must be picked out by hand.

III. Hollow heart is usually most serious in the large rough tubers. Special effort should be made, therefore, to keep the oversized potatoes out of the stock that is to be marketed.

IV. Read circular No. 118, "Michigan Standard Grades for Potatoes" and comply with the law governing potato grades in Michigan. (This circular can be obtained from the Michigan State Department of Agriculture, Lansing, Michigan.)

V. If the potatoes are to be shipped, put them in new, clean sacks.

References

For detailed information on Potato Culture secure the following bulletins:

Write to the Michigan State College, East Lansing, for:

Special Bulletin No. 117—"Potato Culture in Michigan."

Special Bulletin No. 125—"Michigan Potato Diseases."

Special Bulletin No. 137—"Marketing Michigan Potatoes."

Club Bulletin No. 2—"Potato Club Work."

Extension Bulletin No. 36—"Better Potato Exhibits."

"Seed Potato Inspection and Certification Rules."

Write to the Division of Publications, U. S. D. A., Washington, D. C. for the following:

Farmers Bulletin 1064—"Late or Main Crop Potatoes."

Farmers Bulletin 1367—"Control of Potato Tuber Diseases."

Farmers Bulletin 847—"Potato Storage and Storage Houses."

Farmers Bulletin 1091—"Protection of Potatoes from cold in Transit; Lining and Loading cars."

Farmers Bulletin 1332—"Seed Potatoes and How to Produce Them."

Farmers Bulletin 1436—"Why Potatoes Run Out."