OBJECT

The object of the potato project is to teach:

1. The best methods of potato culture.
2. How to keep an accurate record.
3. The value of certified seed.

AGE LIMITS

1. A boy or girl not less than ten or more than eighteen years old.

REQUIREMENTS

2. A special study of potatoes and potato culture.

3. To raise at least one-tenth of an acre of potatoes. Advanced club members may raise any acreage approved by the county agent.

4. The county agent or two disinterested persons must measure the land and sign the record book.

5. The member himself must prepare the ground, plant, cultivate and harvest the crop.

6. The measured yield must be witnessed by the county agent or by the two disinterested persons.

7. An accurate record must be kept of all items of expense and receipts in the space provided in the back of this circular.

8. A short story written by the club member, entitled "How I Grew My Potatoes." See space in back of circular.

CIRCULAR NO. 100

(Revised)

Potato Project
Junior 4-H Clubs

By JOHN S. GARDNER

Potatoes are grown for three distinct purposes, namely: For early summer market or immediate table use; for fall market or storing for winter consumption; and the seed crop, grown at the same time as the late one, for the production of high-quality seed for both the early and late crop the following season.

THE SEED AND ITS PREPARATION FOR PLANTING

When obtainable, only certified seed should be used. More than 700 demonstrations in the use of certified seed, thruout Kentucky, have resulted in an average increase in yield of 68 percent above that produced when common grades of seed were used. From 10 to 15 bushels of seed are required for one acre, depending on the distance between rows and the spacing of the seed pieces in the row.

Variety. It is suggested that the Irish Cobbler variety be used for first-year project whenever possible, but other varieties, of local importance, may be substituted, with the approval of the leader. Advanced club members should be encouraged to use varieties that have particular importance in the community, for thus a business of growing a superior seed stock for the locality may be developt.

Seed Treatment. All potatoes to be used for seed should be treated for scab and black scurf, or rhizoctonia. This should be done even if the seed appears to be free from these diseases.

Certified seed should be treated, for certification is not a guaranty against scab and black scurf.

The solution for treatment is prepared by dissolving corrosive sublimate at the rate of 1 ounce to 7½ gallons of water. Corrosive sublimate can be procured at any drug store or seedhouse. These are the directions:

1. Dissolve one ounce of corrosive sublimate in 2 quarts of boiling water. Do not use a metal container, for the solution corrodes metals. Earthenware or wooden containers should be used.

2. Add this solution to 7 gallons of water in a container which has a capacity of at least 15 gallons.

3. Put the potatoes into a crate or basket which fits inside the container. The better the fit, the more potatoes can be treated with a given quantity of solution. For instance, a round-bottom bushel basket fits closely in a sawed-off 50-gallon barrel.

4. Immerse the potatoes in the solution, so that all are covered. 4 lots may be treated in one batch of solution, immersing the several lots as follows:

1st lot	1 hour
2nd lot	1¼ hours
3rd lot	1½ hours
4th lot	2 hours

After four lots have been treated the solution is too weak to be effective and should be strengthened by the addition of half the original amount of corrosive sublimate, and sufficient water to raise the solution to the original amount. The solution may then be used for three more lots of potatoes, after which it may be strengthened as before and used for three additional lots. After this the solution should be thrown away, a fresh one made, and the process repeated until all the potatoes have been treated.

Caution.—Corrosive sublimate is a deadly poison. Care must be taken to keep it and the treated potatoes away from chickens or stock and especially small children. The hands should be carefully washed after handling it.

The treated potatoes should be spread out where they will dry quickly. Hampers or sacks to be used in handling treated potatoes should be swabbed or soaked in the solution to free them of disease organisms.

Cutting. Cut the tubers as nearly as possible to one-ounce pieces. The cuts should be made so that the pieces are blocky rather than thin or slender and each should have at least one good eye. Potatoes which are discolored just beneath the skin probably are diseased and should be rejected. Immediately after cutting, the pieces should be dusted with sulfur to dry and disinfect the cut surfaces. About 10 ounces of sulfur will be needed for each bushel of seed.

TABLE POTATOES

Selection and Preparation of the Land. A deep, loamy, well-drained soil is best suited for potatoes. Land that may be expected to raise good tobacco generally will make good potatoes. Clover or other sod land is excellent.

The ground should be broken in the fall and left rough, unless the soil is likely to wash during the winter. When fall-breaking cannot be done safely, the land should be broken as early in the spring as the season permits. Breaking should be deep. The deeper the seedbed, the better the crop.

If manure is used it may be plowed under or spread after breaking and disked in. If the latter is done, it is best to use only well-rotted manure.

The soil should be prepared by disking as deeply and thoroly as possible, so that the seedbed will be fine and firm all the way down. The land should be finished with a plank drag or an A-harrow.

Fertilizing. A commercial fertilizer should be used, even if the land has had an application of manure. It should contain all three of the important plantfoods: nitrogen, phosphorus, and potassium. If it is convenient to use a ready-mixed fertilizer. The following analyses are suggested:

5–10–5 on spring plantings, and
4–10–4 on summer plantings.

These numbers stand for the percentages of nitrogen, phosphoric acid, and potash, respectively. The analysis of a commercial fertilizer is always given on the tag attached to the sack. The amount of fertilizer to use on a tenth acre is 80 pounds.

Those club members who wish, may mix their own fertilizers, as follows. The quantities are for 1/10 acre.

For spring planting:

12 lbs. of nitrate of soda,
10 lbs. of sulfate of ammonia,
50 lbs. of 16% superphosphate,
8 lbs. of muriate of potash.

For summer planting:

10 lbs. of nitrate of soda,
8 lbs. of sulfate of ammonia,
50 lbs. of 16% superphosphate,
7 lbs. of muriate of potash.

Time of Planting. A definite date for planting cannot be given because of the seasonal variations in Kentucky, but in the latitude of Lexington, the early potatoes are planted between March 10th and April 10th. In the extreme southwestern part of the state, these dates are 2 weeks earlier, and in the northern and eastern parts, 1 week later.

If Hoosier Boy, Snowflake or other "July" potatoes are used, the date for Lexington and sections north is from June 15th to July 1st. In the extreme southern part of Kentucky "July" potatoes may be planted as late as August 1st.

When cold-storage kept seed of the early varieties is used, the planting date in central Kentucky lies between July 15th and August 1st. Along the northern edge of the state, July 25th is the latest safe date, and in the extreme southern part, August 15th.

Method of Planting. The best way to plant potatoes is with a planter fitted with a fertilizer attachment but, lacking this, they may be planted by hand as follows:

Lay off furrows, from 30 to 36 inches apart, with a one-horse turning plow or with a single shovel plow. The depth of furrow should be 3 inches for spring planting, and 4 to 5 inches for the later-planted potatoes.

Sow the fertilizer in the furrow, at the rate of 1 pound to 20 feet of row (about 800 pounds per acre) and mix it with the soil by going thru the furrow with whatever tool was used to open it.

Drop the seed pieces, one at a place, 13 inches apart, for the early varieties, and from 15 to 18 inches apart for the "July" potatoes. Cover, by plowing two furrows to the row, making a ridge.

Cultivation. The first cultivation should consist in leveling down the ridges. This is done just before the sprouts are ready to break thru. A section harrow with the teeth set back is the best tool to use, but an A-harrow, carefully used, will do. This first cultivation destroys the first weeds and breaks any crust that may have formed. The later cultivations serve to keep down weeds and to keep the surface level and fine. Deep, close stirring should never be given. Neither should soil be thrown to the row, except just enough to cover the tubers. The best tool is the 14-tooth cultivator, altho the 5-tooth cultivator may be used.

Spraying. The object of spraying is to protect the potato tops from insects and disease. The potato beetles may be controlled by a poison spray, but since the black flea-beetles, the leafhoppers and the blight are generally troublesome, it is best to use a combination spray to guard against all of them. Bordeaux mixture to which poison has been added is the best spray to use. It may be made at home, but it is more convenient to use the ready-prepared Bordeaux, handled by most druggists and seedsmen. It comes in two forms, with and without arsenate. The former is the easier to use for it may be added directly to the water, according to directions on the package. If only plain Bordeaux can be obtained, calcium arsenate should be added at the rate of one tablespoonful to each gallon of spray, made according to the directions on the package.

At least 3 sprayings should be given; the first, when the potatoes are just up; the second, in two weeks, and the third,

two weeks later. Two additional sprayings, at intervals of 2 weeks, will be of benefit, for the longer the tops can be kept green the larger the crop will be.

Sometimes plant lice are troublesome. Since they are sucking insects, they can be controlled by spraying with nicotine sulfate. Most druggists and seedmen handle this material and the directions for its use are found on the container. Usually the nicotine sulfate is added to the Bordeaux mixture and calcium arsenate spray.

Harvesting the Early Crop. If the crop is to be sold, harvesting should be done as soon as the potatoes have reached full size and the vines have begun to yellow, for usually the price is better early in the season. If the crop is to be used as table stock thru the latter part of the summer, the potatoes will keep better if left in the ground until after the vines are dead, unless the season is abnormally hot. Under such conditions a cool cellar is the best storage place.

The manner of digging depends on the tools at hand. A standard digger is best, but a turning plow, a shovel plow, a potato fork, or a potato hook will serve. It is best to dig when the soil is dry. If the soil is wet the potatoes should be allowed to dry before they are stored.

Grade out the small potatoes (those weighing 2 ounces or less) as they are picked up. Weigh and record the yield of marketable potatoes. The tubers should be handled carefully so they will not be skinned or bruised, for scars injure their marketability. If the potatoes are to be used for table stock, store them in a cool, dry cellar; otherwise market at once.

THE SEED CROP

Seed potatoes should be grown as a fall crop in Kentucky because it is almost impossible to keep early crop potatoes from one year to the next in the best condition for seed. Many varieties of potatoes sprout so early that seed stock must be kept in cold storage, but the "July" varieties sprout late and may be kept in a cool cellar quite satisfactorily. The sprouting of seed

potatoes during storage weakens them and results in reduced yields.

The "July" varieties usually are planted in June while the early-maturing varieties like Irish Cobbler are planted from July 10th to August 1st. The planting date should be earlier in the eastern and northern part of the state than in the southern and western part.

About a week before planting, the seed stock should be taken from storage, treated, cut, and dusted with sulfur, and then put in a cool place to sprout.

Preparation of the Land. This does not differ materially from that for the table potato crop, except in adaptation to the season of the year. It is advisable to break the land as long before planting as possible, so that several diskings may be given to discourage weeds. It is well to follow the disk with a drag. This helps to conserve spring moisture against the summer droughts that almost always occur. Planting and general culture for the seed crop are the same as for table stock.

The plot used for the seed crop should not be closer than 100 feet to other potatoes and should not be near an orchard. This is for the purpose of preventing serious infestation by insects which carry disease.

SEED IMPROVEMENT

The object of a seed plot is to produce and maintain a high-yielding strain of potatoes. The principal deterioration or "running out" of seed stocks is due to diseases such as mosaic and leafroll. These diseases cause the plants to develop abnormally. Some may be dwarfed, others grow erect with bushy tops, and still others produce curled or twisted leaves. Usually the leaves are pale green and mottled with yellow and green. Such plants produce small, worthless tubers, and their use year after year soon results in the complete "running out" of the stock, for the tubers carry the disease. Since the "running out" diseases are spread by such insects as plantlice and leafhoppers, it is important to spray thoroly and often, to control them. However, the spread of these diseases cannot be entirely pre-

vented by spraying. Consequently it is necessary to remove the diseased plants as soon as they appear, including the old seed pieces. This is called "rogueing." As soon as the potatoes are all up, the plants that appear in any way abnormal should be rogued. In two weeks, the rogueing should be repeated; and again two weeks later. At blooming time, plants with flowers different from those of the variety, should be removed.

After the plot has been rogued for the last time, go over it and mark the plants which appear healthy and vigorous. This should be done before frost. As soon as the vines have been killed by frost, dig the marked hills and select about 120 pounds from the best of them. Put the tubers from each of these selected hills into an 8-pound paper sack. These are the seed stock for the seed crop to be planted the following July. The remainder of the crop should be saved for seed for the early field crop the following spring, or sold as selected seed stock. Hills having a large number of medium-sized, well-developed tubers are preferred to those which have a small number of extra large ones. The stock selected from high-yielding hills as directed, should give an excellent foundation for further improvement. Improvement may be cumulative for several years until a maximum is reached, but selections must be continued from year to year in order to keep a strain at a high standard.

PREPARATION OF AN EXHIBIT

After the potatoes have been harvested a county fair or school show may be held. Potatoes should be exhibited in one-peck lots. If an exhabit is to be made, the tubers for it should be selected in the field, immediately after digging, when a large number can be seen at one time. The specimens for exhibition may be taken from any hills which have well-developt tubers.

CLUB SCORE CARD—POTATO JUDGING

The following score card gives the points which will be observed in judging exhibits. These should be thoroly understood before the exhibition tubers are selected.

Score Card

Date _____

Number of Exhibit _____

Name of Variety _____

Name of Club Member _____

Address _____

Points	Perfect Score	Judge's Score
A—Type (50)		
Uniformity in size and color	20	
Conformity to variety color	5	
Conformity to variety shape	15	
Condition of eyes	10	
B—Commercial condition (50)		
Condit on of skin	15	
Character of flesh	10	
Freedom from disease	10	
Size	10	
Neatness	5	
Total score	100	

Remarks: _____

THE STORY OF THE PROJECT

Subject: "How I grew my potatoes."

Instructions. The story must be written by the club member. It should be written plainly with pen and especial attention should be given to spelling and English. If the story is interesting and well written it may be sent to a farm journal for publication.

Suggested Outline for the Story

1. How I became a club member.
2. Object of the potato project.
3. Why I chose a potato project.
4. Selection and preparation of the seed potatoes.
   - Treatment.
   - Cutting.
5. Soil management.
6. Planting.
7. Spraying.
   - Insects.
   - Diseases.
8. Harvesting. Selection of seed.
9. Storage or sale of the potatoes.
10. Fair exhibits, prizes won, etc.
11. The yield, cost of production, profits, etc.
12. What has your club work done for you?
13. What are your ambitions as a club member for next year?

RECORD

1. Variety of potatoes.....
2. Size of plot.....
3. Kind of soil—rich, medium or poor.....
4. What was grown on the land last year?.....
5. Did you use commercial fertilizers?.....

   Kind of fertilizer used.....

   Amount used .....
6. How much barnyard manure did you use?.....
7. When did you plow (break) your land?.....
8. Number of hours required to plow (break) land.....
9. How did you prepare the seed bed?.....

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10. Number hours required to prepare seed bed.....

11. Number of horses used.....; Hours.....

12. How many hours were used in planting crop?.....

13. How many times did you cultivate your crop?.....

14. Describe each cultivation, naming the implements used.....

15. No. hrs. team was used in cultivation..... No. horses used.....

16. No. hrs. spent by member or help in first cultivation.....

17. No. hrs. spent by member or help in second cultivation.....

18. No. hours spent by member or help in third cultivation.....

19. No. hours spent by member or help in fourth cultivation.....

20. No. hours club member spent in harvesting crop.....

21. No. hrs. help was used in harvesting crop.....

22. No. hours spent by club member in marketing crop.....

23. No. hours help was used in marketing crop.....

24. No. hours team was used in marketing crop..... No. horses used.....

Value your time at 12c per hour.

Value team's time at 10c per hour per horse.

Value adult help at 20c per hour.

BUSINESS ACCOUNT.

Go thru your records and determine the total number of hours you spent on your crop and multiply this number by twelve. This will give the value of your time in cents. The total number of hours adult help was used valued at 20c per hour will give the cost of help. Find the total number of hours team was used and value this time at 10c per hour per horse. Charge $2.00 for each two-horse load (1 ton) of barnyard manure.

Use the following table:

ITEMS OF EXPENSE	Amount	
	Dollars	Cts.
Rent or use of land at $5.00 per acre		
Use of machinery and tools at 40c per acre		
Value of member's time		
Value of help's time		
Value of team's time		
Value of seed		
Cost or value of manure spread on field		
Cost of fertilizer		
Miscellaneous expense (seed treatment and pest control)		
Total expense		
RECEIPTS		
Total number bushels produced		
Value per bushel		
Total value of crop		
Less expense		
Net income		

This is to certify that this project has been carried on to the best of our ability.

..... Club Member

.....Local Club Leader

STORY OF HOW I GREW MY POTATOES

STORY OF HOW I GREW MY POTATOES—Continued.