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IRISH POTATOES.

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RESULTS OF EXPERIMENTS AT TROUPE SUB-STATION,  
SMITH COUNTY.

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# IRISH POTATOES AT TROUPE.

BY EDWARD C. GREEN,  
ASSISTANT HORTICULTURALIST.

This bulletin is a preliminary report of the investigations on the economical production of early Irish potatoes in progress at the Troupe Station. Although it is not always desirable to publish the results obtained from a single season's work, still, the demand from the East Texas truckers for information concerning this crop is greater than can be ignored, especially as the experiments conducted indicate strongly that certain rather radical changes in fertilizing and cultural methods are worthy of consideration and test by the growers. The cultural, variety and fertilizer experiments here reported should be studied by the farmer with a view toward investigating on his own farm the value of the most prominent and interesting points. The work of the past season will be duplicated at Troupe and College Station this year, and fertilizer investigations are planned in co-operation with truckers in four counties in different parts of East Texas. It is expected that the report on this subject for next year will establish more clearly the relation of fertilizers to the needs of the soil with reference especially to the production of early Irish potatoes.

## I. THE CULTURAL EXPERIMENT.

A great difference of opinion exists among truckers as to the relative merits of deep versus shallow planting, and ridge versus level culture. To obtain facts on which to base a fair opinion the following experiment was planned.

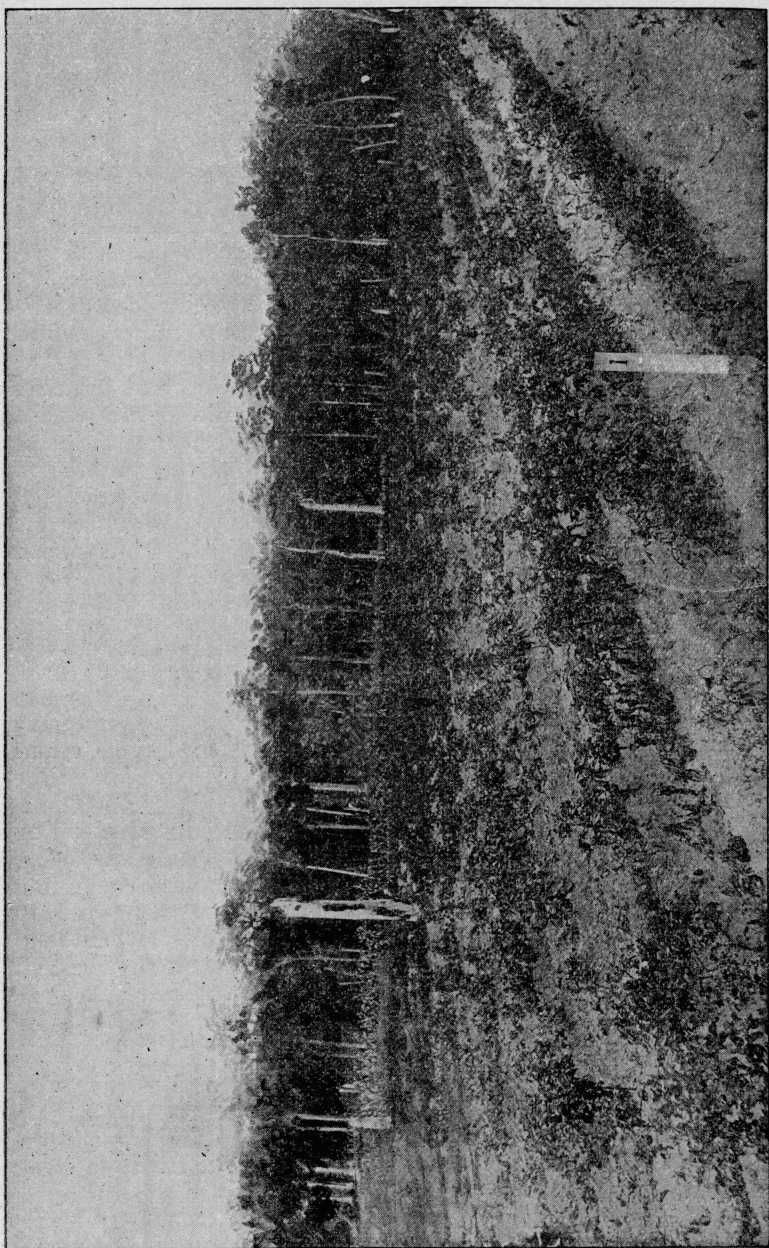
Four one-tenth acre plats were laid off on the most even soil on the Station farm. All plats were prepared in the same way, being plowed 4 inches deep and lightly harrowed. A fertilizer containing 30 pounds cotton seed meal, 50 pounds dissolved bone and 10 pounds sulphate of potash was used on each plat, spread and worked into the drill before planting. The rows were struck off every 3 feet and two eye pieces of even size were planted 12 to 15 inches apart in the drill.

### PLAT 1.

The rows were laid off with a "pony" turning plow run twice in the row, and the potatoes planted as nearly as possible 4 to 4½ inches deep and covered with a sweep. Cultivation through the latter part of the season was with a shovel plow, the rows being well hilled up.

### PLAT 2.

This plat was laid off with a "pony" plow, the fertilizer worked in, as in all plats, with a "buzzard wing" sweep and the seed planted 3 inches deep and covered as in Plat 1. Subsequent cultivation was with the five-tooth cultivator, and when the tubers be-



Plat 1. Rows hilled up with shovel plow.

gan to form shovel teeth were attached to throw a little loose earth on the row.

**PLAT 3.**

This plat was planted as No. 1, the seed being placed  $4\frac{1}{2}$  inches deep. Cultivation throughout the season was with the fourteen-tooth cultivator, and the ground was kept very level.

**PLAT 4.**

The rows in this plat were prepared on the trench system so that the seed could be planted 6 inches deep. Half of the fertilizer was worked into the bottom of the drill and the remainder was applied as the plants reached the surface of the ground. The seed was covered by a section harrow, and until the plants were 2 inches high this implement was used in cultivation, after which level culture with the fourteen-tooth cultivator was given for the remainder of the season. In making the six-inch trench preparatory to planting it was often necessary to enter the subsoil, as the surface soil varies in depth from 4 to 8 inches.

**NOTES ON PLANTING.**

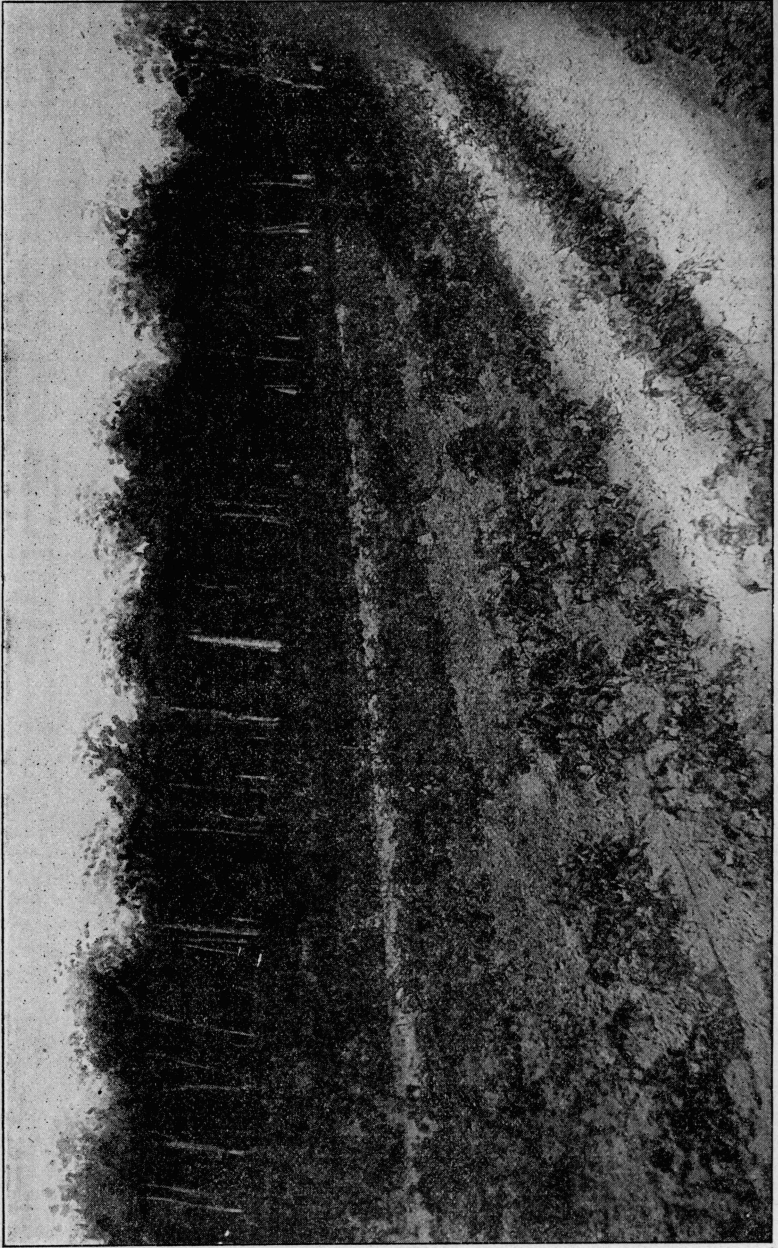
The plats had been prepared for planting for some weeks, but continued rains prevented work until March 7th, when Plat 4 was planted. Rain again interfered with progress and not until March 11th could the other plats be finished. The potatoes set March 7th were partly washed from the trenches and had to be replaced.

Owing to frequent driving rains the ground was packed and sodden and in poor condition for starting the potatoes. To loosen and dry the soil a narrow sweep was run twice through each row of the four plats, throwing up slight ridges. As soon as the soil was warmed and dried somewhat these ridges were harrowed down and subsequent cultivation was as originally planned.

Notwithstanding the heavy and wet condition of the land and the unusual depth at which some potatoes were planted, very little rot occurred, and the stand on Plats 1, 2, and 3 was good, though on Plat 4 a marked decrease in number of hills was noticed. On all plats the plants came up unevenly in regards to time, the first sprouts appearing a week or ten days before the last. Neighboring farmers who planted about the same time lost considerably by rot, and had to replant. The absence of rot in the Station field was probably due to the previous treatment of the seed. The potatoes had been cut to two-eye pieces, sprinkled with fine air-slaked lime, and exposed to sun and air for several days before planting. They were turned over each day and an occasional sifting of air-slaked lime given them. As a result of this treatment the cut surfaces were dry and well cured before planting.

All plats were cultivated an equal number of times, once about every ten days, from planting till harvest. It was not necessary to hand hoe the crop, although some hand work was done in pulling up Johnson grass when it occurred in the row out of reach of the cultivator.

The Colorado potato beetle (common potato bug) and its young appeared in small numbers on Plat 3, and on May 23d this plat



Plat 4 (in foreground), level culture.

was sprayed with Paris green in the strength of 1 pound to 150 gallons of water. The bugs were killed and there was no further trouble from this cause.

On May 29th notes were taken on the relative maturity of the plants. Plats 1, 3, and 4 were beginning to show yellow leaves, while Plat 2 was generally colored and sufficiently mature for market purposes. The plats were harvested on June 16th when fully mature.

Plat.	Depth of planting.	Cul- ture.	Implements.	Yield rate per acre.	
				Potatoes	Culls.
No. 1	4½ inches.....	Hilled.	Sweep and shovel plow...	82 bu.....	10 bu.
No. 2	3 inches.....	Level..	Five-tooth cultivator.....	104 bu.....	2½ bu.
No. 3	4½ inches.....	Level..	Five and fourteen-tooth cultivator.	95½ bu.....	14½ bu.
No. 4	6 inches..... Trench system.	Level..	Harrow and fourteen- tooth cultivator.	67 bu.....	15 bu.

### CONCLUSIONS.

Plat 4 appears to show what one would expect, that deep planting in a wet season is unprofitable. Plats 1 and 3, as compared with Plat 2, indicate in their yields that deep planting tends to produce a greater proportion of culls, and as compared with each other indicate that level cultivation is more profitable than throwing soil to the row and "hilling up" the plants. Plats 2 and 3 show similar yields, but the larger percentage of marketable potatoes is in favor of the shallow planting, which also has the further advantage of producing earlier maturity. Deep planting caused late ripening and a larger proportion of small potatoes.

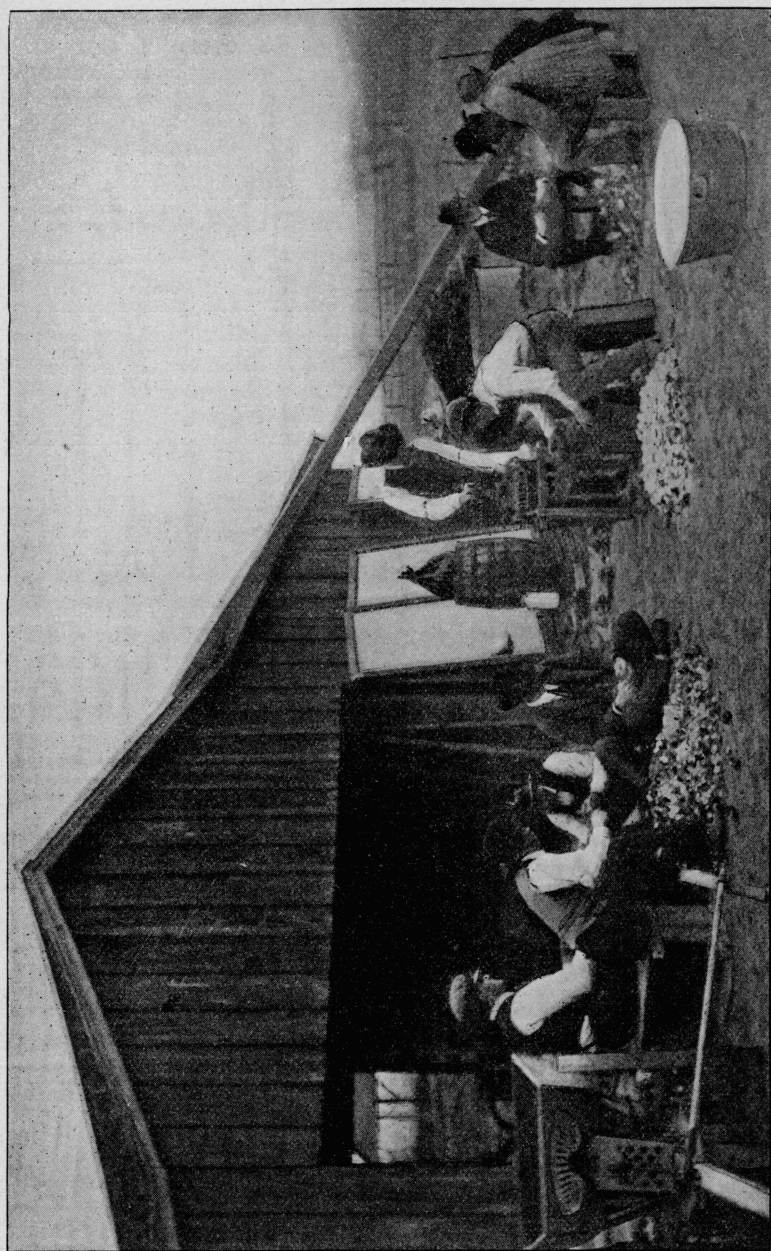
## II. THE VARIETY TEST.

Eight varieties of potatoes were grown side by side. Soil conditions and cultivation were alike in all plats, and, as relative values alone were desired in this experiment, no fertilizers were applied and the potatoes were not planted until the season was advanced sufficiently to assure good growing conditions.

The Triumph,\* being our most common potato, was used as a standard by which to measure the merits of the newer sorts. Texas grown second crop Triumph was over a week later in reaching market maturity than was Northern grown Triumph, though it produced a larger crop than the average from the two plats of Northern grown seed.

The plats were harvested at full maturity, the tops being practically dead. Earlier digging would have been practical from a market standpoint, but it was desired to allow the tubers to ripen fully that they might be in best condition for saving over summer.

\*Known also as Bliss Red, Tennessee Red, Tennessee Triumph, Bliss Triumph, etc.



Cutting seed potatoes by hand and by machine. Treating for "scab" in background.



## IRISH POTATO VARIETY TEST.

Plat No.	Variety.	Seedman.	Planted.	Mature.	Yield per acre.	Remarks.
1	Thorburn.....	Thorburn.....	Mar. 26th...	June 25th...	68 bu.	
2	Triumph.....	Thorburn.....	Mar. 26th...	July 2nd...	24 bu.	
3	B u r. E x t r a Early.	Burpee.....	Mar. 26th...	June 25th...	28 bu.	
4	Early Ohio.....	Steckler.....	Mar. 26th...	July 2nd...	22 bu.	
5	Irish Cobbler...	Landreth.....	Mar. 26th...	June 25th...	67 bu.	
6	Bliss Red.....	Landreth.....	Mar. 26th...	June 25th...	39 bu.	
7	Early Triumph	Steckler.....	Mar. 26th...	.....	.....	Failed to grow.
8	Early Ohio.....	Landreth.....	Mar. 26th...	.....	.....	Failed to grow.
9	Eureka.....	Burpee.....	Mar. 26th...	June 25th...	53 bu.	
10	Early Rose.....	Burpee.....	Mar. 26th...	.....	.....	Failed to grow.
11	Triumph.....	Troupe Sta....	Mar. 26th...	July 2nd...	36 bu.	
12	R u r a l N e w Yorker.	Thorburn.....	Mar. 26th...	July 20th...	.....	Poor stand.

The above table showing the result of one year's trial should not be considered as conclusive evidence, but it suggests a profitable line of experimentation in the future. The Thorburn and the Irish Cobbler doubled the yield of equally early Triumph potatoes, and the Eureka made a very good record. These potatoes are white, however, and may not sell as readily as the Triumph, as the market distinctly favors a red potato. As the quality of the white potato is usually superior to that of the red, it would seem desirable to try the most productive sorts in the home garden for the family supply.

The most promising of these early varieties will be tested again, and it will be of interest to note whether they repeat their performance of the past season.

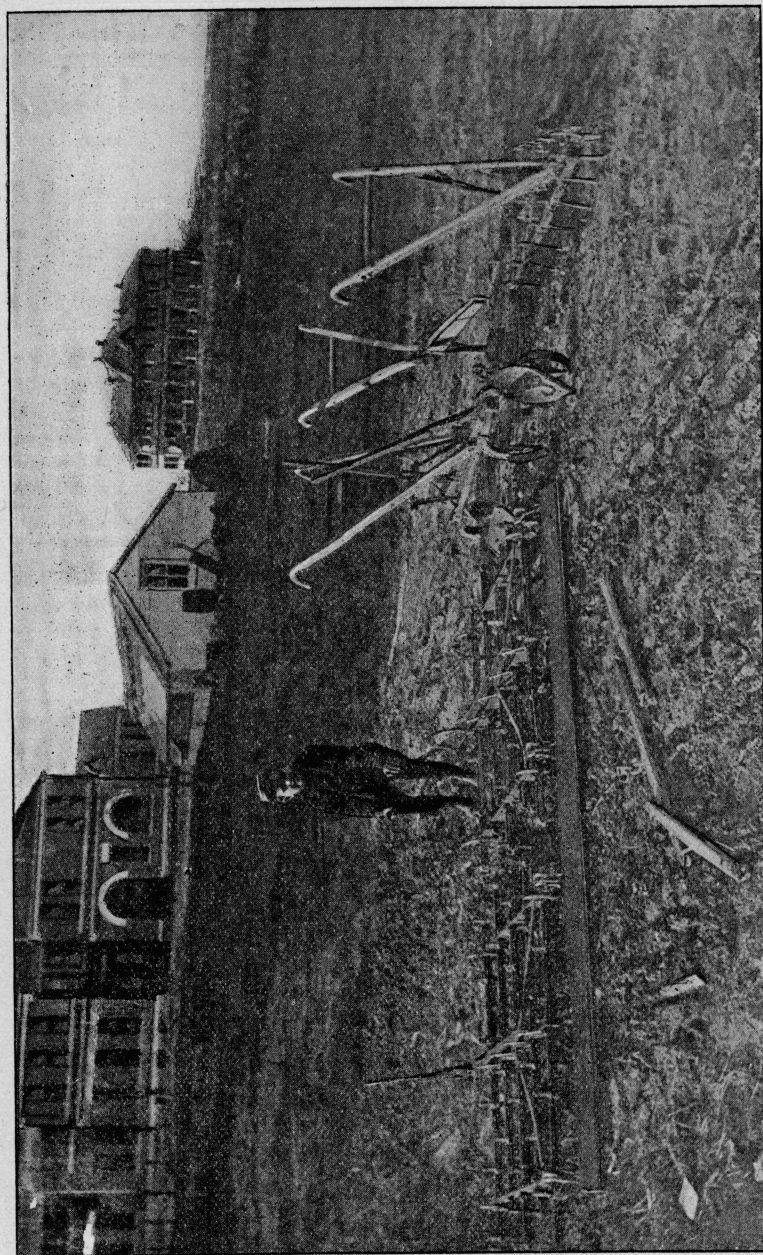
Beside the above planting, another was made later, the varieties used being a few that were delayed in transit. On April 8th Early Thorobred, from Thorburn, and Triumph, Early Rose and Early Ohio, from Texas Seed and Floral Co., were planted, and on July 20th notes were taken as to their degrees of maturity. The Early Rose was beginning to yellow, the Thorobred tops were entirely yellow, and the remaining two varieties were fully mature, the tops being dead and dry. As these potatoes were on well-fertilized soil, the yields are not justly comparable to those of the other plats, which it will be remembered were not fertilized.

### III. FERTILIZING EXPERIMENTS WITH POTATOES.

The fertilizer tests on Irish potatoes were originally planned by my predecessor, Dr. E. P. Stiles, and subsequently carried out after some material alterations had been made by the State Chemist, H. H. Harrington. The object of this experiment was to become acquainted with the needs of the Troupe Station soil with special reference to the potato.

#### PREPARATION OF THE GROUND.

In 1902 a crop of cowpeas was grown on the ground upon which the test was to be made. The pea vines made a good growth, and were left on the soil to increase its fertility. This fact should be borne in mind when considering the results of the test, for the cow-



(1) Section harrow. 2. Five-tooth cultivator. 3. Georgia stock with shovel to lay off rows.  
(2) (3) (4)  
Larger shovel used for hilling. 4. Fourteen-tooth cultivator.

peas undoubtedly affected the whole field by their addition of an unknown quantity of nitrogen.

The soil for the most part is new and has been but recently cleared of stumps. In general it is a sandy, clay loam, underlaid with a tight, red clay subsoil. In February the land was plowed, harrowed twice, and the rows laid off with a small turning plow. Continued rains prevented further work until March 7th, at which time, although the soil was very wet and sticky, the fertilizer was applied. A "buzzard wing" sweep was run through the furrows to loosen the packed soil, the fertilizer was then spread along the drill and the sweep again used to mix it in thoroughly.

#### PREPARATION OF THE SEED.

Early in March the potatoes were cut for planting, and being practically free from "scab" they were not treated for this disease.

It might be stated that in case potato seed is scabby it is unwise to plant it until treated with bichloride of mercury. This poison kills the germ of the disease and prevents its spreading to the new crop. For this purpose four and one-half ounces of bichloride of mercury should be melted in thirty gallons of water. Hang the sack of potatoes in a barrel containing the solution, entirely submerging it for one and one-half hours. It may then be lifted, drained and the potatoes thrown out on the barn floor to be cut for seed and dried. (See illustration.)

Bichloride of mercury, though a poison internally, is not injurious to the skin in the strength used to treat potatoes. In fact it exercises a very beneficial effect upon cuts or sores, and frequently is used as a wash to heal such injuries.

In cutting the potatoes the attempt was made to obtain good sized pieces with two well-developed eyes on each. This was only approximated, as it is impossible in practical operations to obtain exactly two eyes in every instance. After the potatoes were cut they were dusted with air-slaked lime, which aids in drying and healing cut surfaces, and then spread 4 inches deep on the floor and exposed to air and sunshine. The pile was turned over once a day for the first few days, and once every two days thereafter, until all had been taken to the field.

Although the weather was damp and cold and the potatoes were Texas grown second crop Triumphs, there was no decay whatever after cutting. They dried quickly and made first-class seed.

#### PLANTING.

In the loosely prepared soil of the furrows the potatoes were dropped one piece to every 12 or 14 inches in the drill, some care being taken to throw them so as to bring the cut surface down. Planting in this manner required twelve bushels of seed per acre. The potatoes were covered about 3 inches deep by running around the rows with a narrow sweep, which left a light ridge on either side of the row.

### CULTIVATION.

About once a week from the time the seed was planted until plants were 3 inches high cultivation was carried on with the "section" harrow. This was run lengthwise with the rows, then crosswise, and in this manner the soil was kept mellow and loose, while no weeds were allowed to start either in the rows nor in the middles. From this time forward only the five-tooth and fourteen-tooth cultivators were used, and as far as possible the field was worked over once a week. Owing to the good work of these implements it was unnecessary to hand hoe at any time during the season. About the time the potatoes began to make tubers, the shovels were put onto the five-tooth cultivator and a little soil thrown to the row, after which the fourteen-tooth was run through the middles to maintain the dust mulch.

### INSECTS.

At various periods during the season small numbers of potato bugs appeared in the field, and whenever found the plants were treated with some arsenical poison. At no time was it necessary to treat the entire field. Both liquid and dust sprays were used for this purpose according to convenience at the time needed. In the liquid insecticide Paris green was employed at the rate of one pound to one hundred and fifty gallons of water, and when the dust was used about one pound of Paris green was mixed with fifty pounds of air-slaked lime. The liquid was applied with the usual orchard spray pump, and the dust was sifted over the plant with a pepper box. These methods proved equally satisfactory and little difficulty was experienced in controlling the pest.

### HARVESTING.

In harvesting potatoes an attempt was made to utilize one of the cheap potato diggers that are frequently used in East Texas. The digger was extremely unsatisfactory from the fact that it carried the potatoes, soil and tops in front until it was as difficult to get the potatoes from the collected mass as it was to dig them from the row. Consequently most of the crop was dug by hand, and this seems to be the most satisfactory method when only a few acres are grown. The rows were first "barred off" with a "pony" plow, the mule going around every other row. Then they were dug with the potato fork, three pickers following two diggers, so that the potatoes were not exposed to the sun but a few minutes. This is very essential when potatoes are to be stored or shipped, for if exposed to the sun even for a short time injury may result. As soon as gathered the potatoes were sacked and placed under canvas shades until loaded on wagons and carried to the barn. The sorting was done as the potatoes were gathered from the field, two men picking the marketable spuds, and the third man the culls.

The following table shows the kinds of fertilizers used, the rate per acre and cost, the yield of potatoes, and the gain over the unfertilized check which accompanied each plat:

No. plat.	Fertilizers used.	Percent of plant food.	Fertilizer cost.	Yield, marketable.	Culls.	Gain marketable.
1	94 lbs nitrate of soda .....	16 N .....	\$ 2 03	46 bu.....	5 bu.....	13½ bu.
2	Check (nothing).....	.....	.....	32½ bu.....	10 bu.....	.....
3	285 lbs. acid phosphate.....	14 P.....	2 40	62½ bu.....	6 bu.....	23½ bu.
4	Check.....	.....	.....	39 bu.....	9 bu.....	.....
5	80 lbs. sulphate of potash.....	50 K.....	2 00	40 bu.....	4 bu.....	13 bu.
6	Check.....	.....	.....	27 bu.....	8 bu.....	.....
7	250 lbs. lime.....	.....	.....	28 bu.....	7 bu.....	3 bu.
8	Check.....	.....	.....	25 bu.....	7 bu.....	.....
9	214 lbs. cotton seed meal.....	7 N, 3 P, 1½ K.....	2 68	35 bu.....	4 bu.....	10 bu.
10	Check.....	.....	.....	25 bu.....	7 bu.....	.....
11	94 lbs. nitrate and 285 lbs. acid phosphate.....	4 N, 10 P.....	4 43	63 bu.....	7 bu.....	36 bu.
12	Check.....	.....	.....	27 bu.....	6 bu.....	.....
13	94 lbs. nitrate and 80 lbs. sulphate of potash.....	9 N, 23 K.....	4 03	31 bu.....	7 bu.....	2 bu.
14	Check.....	.....	.....	29 bu.....	6 bu.....	.....
15	285 lbs. acid phosphate and 80 lbs. sulphate potash.....	11 P, 11 K.....	4 40	55 bu.....	7 bu.....	29 bu.
16	Check.....	.....	.....	26 bu.....	3 bu.....	.....
17	94 lbs. nitrate, 285 lbs. acid phosphate, 80 lbs. sulphate of potash.....	3 N, 8 P, 8 K.....	6 43	58 bu.....	9 bu.....	24 bu.
18	Check.....	.....	.....	34 bu.....	3 bu.....	.....
19	94 lbs. nitrate, 140 lbs. acid phosphate, 1 ton ashes.†.....	.....	4 21	35 bu.....	4 bu.....	9 bu.
20	Check.....	.....	.....	26 bu.....	4 bu.....	.....
21	214 lbs. cotton seed meal, 140 lbs. acid phosphate, 1 ton ashes†.....	.....	4 86	31 bu.....	5 bu.....	15 bu.
22	Check.....	.....	.....	16 bu.....	3 bu.....	.....
23	140 lbs. acid phosphate, 50 lbs. sulphate of potash, 2 tons barn manures.‡.....	.....	4 43	35 bu.....	4 bu.....	12 bu.
24	Check.....	.....	.....	23 bu.....	3 bu.....	.....
25	94 lbs. nitrate, 213 lbs. acid phosphate, 80 lbs. sulphate of potash.*.....	3 N, 6 P, 8 K.....	5 82	40 bu.....	5 bu.....	15 bu.
26	Check.....	.....	.....	25 bu.....	3 bu.....	.....
27	94 lbs. nitrate, 285 lbs. acid phosphate, 60 lbs. sulphate of potash.*.....	3 N, 8 P, 6 K.....	5 93	81 bu.....	9 bu.....	42 bu.
28	Check.....	.....	.....	39 bu.....	10 bu.....	.....
29	94 lbs. nitrate, 331 lbs. acid phosphate, 60 lbs. sulphate of potash.*.....	3 N, 10 P, 6 K.....	6 31	93 bu.....	9 bu.....	64 bu.
30	Check.....	.....	.....	29 bu.....	7 bu.....	.....
31	"Texas Truck Grower" half ton per acre.....	.....	13 00	107 bu.....	9 bu.....	67 bu.
32	Check.....	.....	.....	40 bu.....	8 bu.....	.....
33	500 lbs. acid phosphate, 500 lbs. kainit.....	7 P, 12 K.....	8 50	62 bu.....	10 bu.....	22 bu.
34	500 lbs. acid phosphate, 500 lbs. kainit.....	7 P, 12 K.....	8 50	65 bu.....	6 bu.....	25 bu.

NOTE.—The potatoes were sold in Troupe at time of digging, for 75 cents per bushel.

† Ashes, \$1.00 per ton. ‡ Manure, \$1.00 per ton. \* On basis of 500 lbs. per acre.

NOTE.—In the table phosphoric is represented by P, nitrogen by N and potash by K.

On plats Nos. 1, 3, and 5 were tried, respectively, nitrate of soda, acid phosphate and sulphate of potash in quantities which, if combined, would have made a fertilizer containing 3 per cent. nitrogen, 8 per cent. phosphoric acid and 8 per cent. potash. By consulting the table it will be seen that the acid phosphate makes the greatest yield, producing twenty-three and one-half bushels per acre more than its check plat on which none was applied. Wherever over 250 pounds of this fertilizer were used a good gain resulted, but where less than this amount was applied the yields are not proportionately high. For example see Plats 11, 15, 17 and 19, 21, 23 and 25. Where the nitrate and potash were held constant and the proportion of phosphate increased, as in Plats 27 and

29, there is a marked gain showing further that phosphate is the needed plant food.

Nitrate of soda and sulphate of potash, separate and combined, gave comparatively small increases in yield. Lime, ashes and barnyard manure appear to have given no adequate gains, and cottonseed meal was disappointing, both when used alone and in combination. The last named appears to be too slowly available to be desirable as a form of nitrogen for the quick-maturing Triumph potato, and nitrate nitrogen seems more desirable for the extra early crop.

The only prepared fertilizer tested was that used on Plat 31. This gave good results in yield, although it cost more than the home-mixed combinations. Throughout the season this plat presented a fine appearance, the growth of tops being double that of its check.

Where acid phosphate and potash, in form of kainit or sulphate, were used the maturity of the crop was hastened (see notes on Plats 15, 33 and 34), and a gain was made in yield, though not so great as where the fertilizer was made complete by the addition of nitrate of soda. An exception to this appears in the gain of Plat 17 over its check as compared with that of Plat 15 over its control row. However, it will be seen in check Plat 18 a considerable increase of yield is noted over checks 16 and 20, and this is doubtless due to the wind having carried a small part of the fertilizer from Plat 17 on to Plat 18 at the time the application was made. From the nature of the plats and the strength of the wind on the day the fertilizer was spread, it is most probable that this occurred wherever the lighter fertilizers were used. In all cases the acid phosphate was the driest and most easily carried of the ingredients, and examination of the above table shows that check Plat 4 is notably affected in yield, as also are check Plats 18, 28, 30 and 32. The plats consisted of single rows 3 feet apart and long enough to make one-fortieth of an acre. The wind was high, blowing almost directly across the rows, and, although the fertilizer was spread along the row carefully, due pains being taken to distribute close to the ground, still from the evidence of the check plat yields it would seem that considerable of the finer dust and lighter particles were blown over at least as far as the accompanying row, the check plat, on the leeward side.

Perhaps the most important result, or indication, if one does not choose to consider a single season's test sufficient to warrant the term result, is that phosphoric acid rather than potash determines the quantity of the yield in soils of the nature of that at Troupe Station. In Plats 25, 27 and 29 the yield increases in almost a direct ratio to the amount of acid phosphate used. It would appear from the constant relation of yield to phosphoric acid application that this is the food element most wanting in the soil, and a study of the table brings forth strongly the principle that the yield is controlled by the element present in smallest quantity in proportion to the needs of the plant. The smaller quantity of sulphate of potash used in Plat 27 as compared with Plat 25 did not affect the increased yield caused by the added quantity of acid phosphate.

The usual general recommendation for a potato fertilizer is to apply one containing 3 per cent. nitrogen, 6 per cent. phosphoric acid and 8 per cent. potash. The above experiment shows that a phosphoric acid alone yields more than this combination and costs only one-half as much. It further shows that a combination containing 3 per cent. nitrogen, 8 per cent. phosphoric acid and 6 per cent. potash greatly increased the yield over phosphoric acid alone, and the crop was still further multiplied by a 3 per cent. nitrogen, 10 per cent. phosphoric acid and 6 per cent. potash combination. All of this has an important practical application, as an increase of 2 per cent. of phosphoric acid to the usual potato fertilizer and a decrease of 2 per cent. of the potash content did not materially change the cost of the mixture, while it made an additional yield of over forty bushels per acre of marketable potatoes; and the further increase of 2 per cent. phosphoric acid at a cost of 38 cents made a further additional yield of twelve bushels per acre. In short, the Troupe mixture of the 3-10-6 formula used on Plat No. 27 cost 49 cents more than the commonly recommended potato fertilizer of the 3-6-8 formula, and made fifty-three bushels more potatoes per acre.

#### NOTES.

The effect of various fertilizers was noticed in the maturity and growth of the plants, and on May 29th accurate notes were made on this point as follows:

- Plat 1. Plants slightly larger and more even than its check.
- Plat 2. Plants at least one-half larger than its check.
- Plat 5. Plants more even in rows and a trifle larger than check.
- Plat 7. No noticeable difference from check plat.
- Plat 9. A more perfect stand than check plat and plants one-fourth larger.
- Plat 11. Plants two-thirds larger than check, darker in color and of stockier growth.
- Plat 13. Plants larger and a trifle darker than check.
- Plat 15. Plants two-thirds larger than check, and more yellow and matured.
- Plat 17. Plants three-fourths larger than check, and of a trifle darker color.
- Plat 19. Plants slightly larger and more even than check.
- Plat 21. Plants larger and slightly darker than check.
- Plat 23. Plants one-fourth larger and a little darker than check.
- Plat 25. Plants one-half larger than check.
- Plat 27. Plants twice as large as check.
- Plat 29. Plants one-half larger than check.
- Plat 31. Plants twice the size of check and darker.
- Plat 33. Plants two-thirds larger than check and distinctly yellow.
- Plat 34. Same as Plat 33.

## GENERAL REMARKS.

One never can tell what fertilizer a crop needs on a given soil until by experiment he has come to know the strength and weakness of that soil. The chemist, by soil analysis, can give him little, if any, aid as physical texture, weather conditions and cultural methods all affect the availability of the plant foods actually present. The experimenter's results at the State Stations can be taken only as indications of what may be expected on soils similar to those in which he conducted his experiments. So, finally, the farmer has to take up the problem of what his own farm needs and solve it by home experiments. This he can easily do in the case of Irish potatoes by laying off eight plats of equal size and on seven of these applying at the same rate per acre the fertilizers used in the above test on Plats 1, 3, 5, 11, 13, 15 and 17. The eighth plat should be a check entirely unfertilized. Each plat should be separated from its neighbors by a six-foot space, or an unfertilized separation row.

Until such intelligent investigation can be made by each grower, the results obtained at the Station whose soil and location most closely resemble his own should be accepted as the most reliable guide. Troupe Station has blazed a trail from the old idea fertilizer to a new combination, and an increased profit in potato culture. It remains for the grower but to follow the shorter path to greater success, and to verify on his own farm the value of the suggestions presented him by the above experiment.

## SUMMARY.

1. Potatoes planted 3 inches deep matured earlier and produced a larger crop than those planted 4½ and 6 inches deep.

2. Level culture proved more profitable than bedding and "hilling up" the rows.

3. The gray, sandy clay soil, with red subsoil, at Troupe Station responded more profitably to application of acid phosphate than to any other single fertilizer.

4. In a complete fertilizer, potash over 6 per cent. was unprofitable, while unusually large percentages (8 per cent. and 10 per cent.) of phosphoric acid greatly increased the yield.

5. Cotton seed meal applied only a few days before planting was too slowly available to prove a desirable fertilizer for early potatoes.

6. Northern grown seed potatoes produced their crop at least one week in advance of second crop Texas grown seed.

7. Some of the early white sorts produced much more abundantly than the red Triumph and were equally early. It is suggested that these varieties be planted experimentally by truckers.