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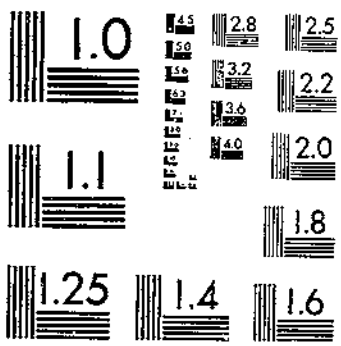

MICROCOPY RESOLUTION TEST CHART
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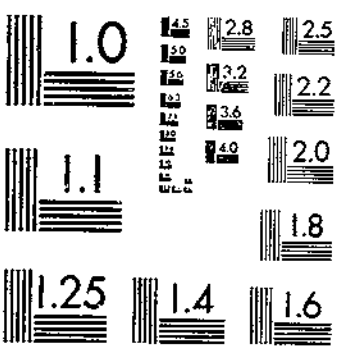

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EFFECT ON SUBSEQUENT YIELDS OF STORING CUT SEED POTATOES AT DIFFERENT TEMPERATURES AND HUMIDITIES

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CONTENTS

INTRODUCTION

The practice of cutting potatoes into seed pieces in advance of planting time is often followed in various sections of the country. The principal reason for this practice is the more economical distribution of labor that it affords. In slack times, or during weather unfavorable for outdoor work, the grower can get the seed cut and ready, giving all his energy to planting the crop when conditions are favorable.

However, there seems to be no uniformity in the methods of handling or of storage of such potato seed pieces in advance of planting, and at times decidedly adverse results have been obtained. Very little reliable information has been published, since little comprehensive research has been devoted to a study of the influence on yield of the advance cutting and storage of potato seed pieces.

Much has been written regarding the effect of various temperatures on the healing or corking over of cut or wounded surfaces of potatoes. Many of these studies have been pathological in scope, being concerned with the formation of wound periderm which prevents the entrance of various decay organisms during storage.

Probably the most comprehensive discussion of this process of healing is given by Priestley and Woffenden,[1] and is based on their own work and that of previous investigators. Briefly they state that a microscopic examination made of potato seed pieces kept under favorable conditions a few hours after cutting shows an impermeable

[1] PRIESTLEY, J. H., and WOFFENDEN, L. M. THE HEALING OF WOUNDS IN POTATO TUBERS AND THEIR PROPAGATION BY CUT SETS. Ann. Apl. Biol. 10: 96-115, illus, 1923.

deposit forming around and between the cell walls to a depth of two or even more layers of cells beneath the cut surface. This deposit, forming a "suberin" layer, is built up by the oxidation and condensation of fatty substances from free sap drying at the surface in the presence of oxygen. This layer effectively serves to block the region beneath the wounded surface and protects it from penetration by pathogenic organisms and from excessive evaporation. This process was studied at 59° and 77° F., and the rate of formation at the latter temperature was found to be twice that at the former. When formed in a moist atmosphere this protective layer is continuous, but in a dry atmosphere and especially in sunlight it may not be continuous and therefore is not an effective barrier. Further, under the latter conditions the sap freed from the wounded cells along the cut surface tends to dry quickly into a brittle crust, effectively cutting off oxygen essential to the formation of the protective suberin deposit just described. Later this crust cracks, leaving avenues of entry to the unprotected inner tissues for such decay organisms as may be present and also for the escape of moisture. With the formation of the suberin layer, however, the process of healing is not complete. Under favorable conditions, in from 24 to 48 hours after cutting, there begins to form below this suberin deposit a layer of cork which is the result of actively dividing cells in a layer of more or less flat cells three or more thick and lying roughly parallel to the cut surface. This new layer is known as the cork phellogen or wound periderm. The authors show that there is a marked difference in varieties as to the rate of wound healing under identical conditions.

Artschwager,[2] in his study of wound periderm in the potato as related to temperature and humidity, found that in the Irish Cobbler variety no wound-periderm cells appeared at temperatures lower than 44.6° F. At this temperature the first periderm cells appeared after the ninth day, at 50° after the fourth day, at 59° after the third day, and at 70° after the second day. At these various temperatures he found that the most rapid formation was at relatively high humidities.

Weiss, Lauritzen, and Brierley,[3] in their study of the development of various species of Fusarium rot in six varieties of potatoes, noted a marked varietal difference in healing to prevent infection. They found that with the Rural New Yorker variety 3 to 4 days at 70° F. were required to produce a wound periderm that could prevent the entrance of *Fusarium coeruleum* and *F. sulphureum;* 5 or 6 days at 60° were required, and 8 or more days at 50°. With the Spaulding Rose variety, which, like the Irish Cobbler, forms a wound periderm more rapidly, only 1 to 3 days were required at 70° and 60°.

The primary purpose of this investigation was to determine the best method for the handling and storage of cut seed pieces. Since the practice of cutting potatoes in advance of planting is established and adverse results are often met owing to improper methods, it seemed desirable to develop methods whereby as good yields could be obtained as when the seed is cut just before planting. The scope of this study was twofold. (1) It was desired to determine and compare the relative vigor of growth and yield from seed cut and stored in advance of planting with that from seed cut immediately before

[2] ARTSCHWAGER, E. WOUND PERIDERM FORMATION IN THE POTATO AS AFFECTED BY TEMPERATURE AND HUMIDITY. Jour. Agr. Research 35: 995-1000, illus. 1927.

[3] WEISS, F., LAURITZEN, J. I., and BRIERLEY, P. FACTORS IN THE INCEPTION AND DEVELOPMENT OF FUSARIUM ROT IN STORED POTATOES. U.S. Dept. Agr. Tech. Bul. 62, 36 p., illus. 1928.

planting. (2) It was desired to compare the vigor and yield from seed pieces stored for different lengths of time at different temperatures and humidities.

MATERIALS AND METHODS

The investigation reported herein was conducted by the writers from 1926 to 1930 on potatoes grown and stored at the Arlington Experiment Farm in Virginia, near Washington, D.C. The investigation in 1926, 1927, and 1928 includes the results from two plantings each year of both stored seed pieces and seed freshly cut at the time of planting, one planting being made during March or April of each year while the other was made early in July. In 1929 only a late crop was planted; in 1930 only an early crop. The growing of two crops each year was not for the purpose of comparing early and late plantings but rather to obtain additional experimental data in a single year upon the problem being studied.

VARIETY AND SOURCE OF SEED

The seed used in these experiments was carefully selected from stock grown by the United States Department of Agriculture either at Presque Isle, Maine, or at the Arlington farm. The seed stocks used were authentic and included the varieties Irish Cobbler, Triumph, Green Mountain, and Russet Rural.

SEED CUTTING AND STORAGE

Previous to cutting into seed pieces, all lots of potatoes were treated for the control of various tuber-surface diseases with hot formaldehyde solution in the proportion of 1 pint to 15 gallons of water. The solution was kept at a temperature of 122° to 126° F., and the potatoes were immersed for 3 minutes. After thoroughly drying, which usually required about 24 hours, the tubers were cut with a sharp, thin-bladed knife into seed pieces of approximately 2 ounces. The seed pieces were then thoroughly mixed to eliminate any individual differences due to different cutters, and were apportioned into sublots as desired for the various storage conditions. After the first 24 hours of storage the cut seed was poured from one container to another, to break apart the pieces that tended to stick together. In the 1926 and 1927 experiments this was repeated each 24 hours during the storage period, since at this time the effect of humidity on the seed pieces was a special feature, and it was thought that by this procedure a more nearly uniform humidity could be maintained throughout the sample.

THE PLANTING PLAN

The early crop each year was planted in April and the late crop in July, while the harvesting of each crop, respectively, was in late July or early August and late October or early November. In 1926 two replications of lots from each storage condition were planted, while for the other years four replications were made and arranged so as not to be adjacent. The planting scheme was to set in regular rotation rows representing each storage condition. In 1926 the seed pieces were set every 14 inches in rows 39.4 inches apart, while in the succeeding years the pieces were set every 12 inches in rows 32 inches apart. Throughout the investigation, rows 66 feet long were used.

CULTURAL METHODS AND HARVESTING

Planting and digging were done by hand in 1926 and 1927 and by machinery thereafter, the planter being of the 2-man type. Grading was done by hand more easily to keep the various lots separated. Sufficient cultivation, fertilization, and spraying were practiced to insure keeping the plants in a thrifty growing condition. Each year when the plants were from 8 to 10 inches high a count was made to determine the relation of the actual stand to the number of seed pieces planted per row. Harvesting was delayed until practically all the vines were dead. The potatoes from each row were put in labeled baskets after digging and hauled directly to the workroom in the storage building where, after drying off for 24 to 48 hours, they were separated into two grades designated as no. 1, including all normal potatoes corresponding in size with U.S. Grade No. 1, and no. 2, corresponding with the U.S. Grade No. 2. The remaining tubers were discarded.

INVESTIGATIONS IN 1926 AND 1927

TEMPERATURE AND HUMIDITY STUDIES

In each of the years 1926 and 1927 two cuttings of seed were made, one 10 days ahead of the other, so that when planted the two lots had been stored for approximately 10 and 20 days. These periods varied because the exact time of planting depended upon weather conditions. After being cut, each lot was thoroughly mixed and apportioned into 9 sublots of about 30 pounds each. These sublots were stored at temperatures of 32°, 40°, and 50° F., with relative humidities of approximately 70, 80, and 95 percent at each temperature, making nine storage conditions in all. At the conclusion of the storage period, all lots were removed and left overnight at ordinary room temperature, to bring them all to a uniform temperature before planting. The seed pieces from all the low humidities became rather dark in color on the cut surfaces and more or less shriveled, owing to loss of water. Some mold growth was evident on the cut surfaces of the pieces in all temperatures at these humidities. The seed pieces kept at the intermediate humidities were only slightly wilted, while those kept at high humidities were still rather turgid, light in color over the cut surfaces, and free from any mold growth. In none of the lots from the 32° storage temperature were the cut surfaces properly healed or corked over. The surfaces were covered with a brittle crustlike layer which readily cracked and rubbed off during handling. This condition was also apparent to some extent in samples kept at the lowest humidities and the higher storage temperatures. The cut surfaces of seed pieces kept at the intermediate and high humidities at 40° were only fairly well healed over, whereas at 50° at these humidities a definite corklike suberin layer was developed that was more or less resistant to ordinary handling.

In 1927 the various lots of cut seed were weighed when put in storage and when removed. In table 1 is shown the average percentage of loss in weight of all varieties when stored under the different conditions. It will be noted that little difference in loss of weight is apparent for cut seed kept at the high humidities for different periods of time, but in cut seed kept at the low humidities, while loss was greater than at the high humidities, it increased with the length of the

storage period. This increase indicates a lack of protective healing or corking over of the cut surfaces, which at the high humidities, even at 32° F., apparently soon developed sufficiently to greatly restrict the loss of weight.

TABLE 1.—*Average percentage of loss in weight of cut seed potatoes stored from 9 to 21 days at different temperatures and relative humidities, 1927*

Planting and duration of storage	Loss in weight at—								
	32° F.			40° F.			50° F.		
	Low humidity	Medium humidity	High humidity	Low humidity	Medium humidity	High humidity	Low humidity	Medium humidity	High humidity
Early:	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
12 days	5.3	3.8	1.8	7.1	3.3	1.8	8.3	3.8	2.7
20 days	7.0	4.2	2.0	8.5	4.8	1.6	18.2	5.6	2.5
Late:									
9 days	4.4	2.3	1.5	4.4	3.0	2.2	6.4	4.5	1.8
21 days	6.9	3.4	1.6	11.0	7.7	3.1	15.4	9.0	4.5

In 1926 no field comparisons were made with plantings of potatoes that were freshly cut just before planting. In 1927 the uncut check tubers were held throughout the test at all the temperatures, together with the cut seed pieces, in order to give a complete comparison between stored seed pieces and tubers that were stored whole under similar conditions and freshly cut at planting time. However, these uncut tubers or checks were not held under the various humidities with the cut pieces, since obviously they would not be so directly affected during the short-storage period. The humidity conditions under which these checks were held would compare closely with the intermediate humidities under which the cut pieces were held.

In 1926 the early planting included two lots each of the Irish Cobbler and Triumph varieties which were cut and stored March 19 and March 30. The storage periods of each variety represented 25 and 14 days, respectively, as the potatoes were all taken out on April 13 and planted the following day. A count to determine the number of seed pieces germinated was made 33 days after planting, when all the plants which would be likely to yield any marketable tubers were up. The result of this count is expressed as the percentage of stand based on that of a perfect stand. This planting was harvested July 28.

In 1926 the late planting included two lots each of Irish Cobbler, Triumph, Green Mountain, and Russet Rural varieties. Seed lots were cut and stored on June 16 and June 25, taken out July 5, and planted the following day. The storage periods in this planting were 19 days and 10 days, respectively. When removed from storage at the low humidities the seed pieces showed severe shriveling, with considerable mold growth over the cut surfaces. In the Russet Rural variety this condition was most marked, and considerable decay was noted in a number of seed pieces. The germination count was taken 33 days after planting. The Irish Cobbler and Triumph varieties maturing earlier were dug November 1; the Green Mountain and Russet Rural varieties were dug November 11. The vines of the latter varieties had not matured but were killed by frost about 5 days before digging.

In 1927 the early planting, including Irish Cobbler and Triumph varieties, was made on April 12. Two cut lots of each variety which

had been held in storage under the different temperature conditions for 20 and 12 days, respectively, were planted. The percentage of stand was determined 42 days after planting. The two varieties did not mature so nearly at the same time as the year before; the Triumph was dug July 26 and the Irish Cobbler not until August 2.

The late planting in this year was made on July 7. The Irish Cobbler, Triumph, Green Mountain, and Russet Rural varieties were again used. Two cut lots of each variety were stored for 21 and 9 days, respectively. The percentage of stand was determined by a count made 18, 30, and 36 days after planting.

FIELD OBSERVATIONS

General observations of the growth of the potatoes in the field after storage under different conditions demonstrated that seed from 32° F. did not germinate so quickly as that from 40° or 50°. The plants from seed stored at 50° appeared above the soil quicker than from seed stored at the lower temperatures; also, plants from seed stored at the higher humidities generally appeared above the ground before those from seed stored at the lower humidities. Greater differences between low and high humidities were apparent from seed stored for the longer period of time. These differences in size of plants were apparent until about the time the plants neared maturity, when little variance in size was noticeable. The plants from seed stored at 50° usually came into bloom first. In 1927, 54 days after the early planting had been made, the plants of both Irish Cobbler and Triumph varieties from seed stored at 50° were practically in full bloom, those from seed stored at 40° showed the flower stems elongated but no bloom, and those from seed stored at 32° showed the flowers in the early bud stage. In 1927 freshly cut seed was planted as checks, and the stand usually compared fairly closely with that from seed stored at 50° with high humidity. In general, cut seed stored at the lower temperatures and humidities did not compare favorably with the freshly cut or check lots of seed planted immediately after cutting.

The average percentages of stand of the various varieties and lots of potatoes planted in 1926 and 1927 are shown in tables 2, 3, and 4. These results are calculated as the percentage of a perfect stand from actual counts made of the plants visible above the soil. In table 2 is shown the average stand in 1926 of all varieties used in both early and late plantings. In table 3 is given the stand for the early crop only in 1927; table 4 gives the stand for the late crop at three periods, the first and second counts being taken before all the potato plants had appeared, showing which group of seed was the first to germinate. Without regarding the individual varieties, these results show a definite but rather insignificant increase in stand as the humidity at which the seed was stored increased. Also in most cases the stand increased (especially in 1927) as the storage temperature increased from 32° to 50° F. However, these results are not entirely consistent, for especially in 1926, when studying individual cases, results at variance with the general average were noted. For the late crop in 1927, germination records were taken 18, 30, and 36 days after planting, in order to determine the comparative rate of germination of seed pieces stored under the conditions described.

TABLE 2.—*Average percentage of stand in the 1926 early and late crops of potatoes from cut seed pieces stored at different temperatures and relative humidities for various periods of time before planting*

Planting and variety	Period of storage after cutting	Storage temperature	Stand from cut seed stored in—		
			Low humidity	Medium humidity	High humidity
Early:	*Days*	*° F.*	*Percent*	*Percent*	*Percent*
Irish Cobbler	25	32	32.5	85.1	93.9
		40	89.5	90.4	93.9
		50	90.4	89.5	86.0
Triumph	25	32	80.7	79.0	93.9
		40	86.8	80.7	92.1
		50	71.9	81.6	88.6
Irish Cobbler	14	32	86.8	86.8	86.0
		40	89.5	83.3	90.5
		50	84.2	86.0	99.9
Triumph	14	32	81.6	73.7	82.5
		40	85.1	87.7	93.9
		50	93.9	93.9	91.2
Late:					
Irish Cobbler	19	32	97.0	98.2	100.0
		40	93.9	96.5	99.1
		50	78.1	94.8	98.2
Triumph	19	32	95.6	98.2	97.4
		40	90.4	97.4	100.0
		50	86.8	98.2	98.2
Green Mountain	19	32	91.2	92.1	94.8
		40	67.5	92.9	99.1
		50	73.7	94.8	97.4
Russet Rural	19	32	77.2	83.3	89.5
		40	66.7	78.1	96.5
		50	85.1	73.7	96.5
Irish Cobbler	10	32	94.8	98.2	96.5
		40	95.0	96.5	98.2
		50	90.4	96.5	96.5
Triumph	10	32	94.8	99.1	97.4
		40	94.8	99.1	98.2
		50	83.3	100.0	100.0
Green Mountain	10	32	99.1	99.1	99.1
		40	92.1	95.6	100.0
		50	86.0	97.4	99.1
Russet Rural	10	32	89.5	89.5	91.2
		40	79.0	91.2	95.6
		50	90.4	71.1	90.4

TABLE 3.—*Average percentage of stand in the 1927 early crop of potatoes from cut seed pieces stored at different temperatures and relative humidities for different periods of time before planting, as compared with the stand from seed stored whole in medium humidity at the same temperatures, but cut immediately before planting*

Variety	Period of storage after cutting	Storage temperature	Stand from cut seed stored in—			Stand from whole seed stored at medium humidity and cut immediately before planting
			Low humidity	Medium humidity	High humidity	
	Days	*° F.*	*Percent*	*Percent*	*Percent*	*Percent*
Irish Cobbler	20	32	89.6	92.5	93.3	98.9
		40	94.8	95.5	98.5	98.9
		50	92.5	99.3	99.3	99.6
Triumph	20	32	80.2	92.8	94.4	90.3
		40	93.7	95.9	98.9	98.1
		50	87.3	98.5	100.0	98.9
Irish Cobbler	12	32	95.9	97.0	98.9	97.0
		40	95.9	96.3	97.4	98.0
		50	95.5	97.4	98.1	98.9
Triumph	12	32	92.6	93.3	97.0	95.5
		40	95.9	98.9	99.3	95.5
		50	93.7	96.3	98.1	98.1

TABLE 4.—*Percentage of stand in the 1927 late crop of potatoes from cut seed pieces stored at different temperatures and relative humidities for different periods of time, as compared with the stand from seed stored whole in medium humidity at the same temperatures and cut immediately before planting*

[Stand records taken 18, 30, and 36 days after planting]

Seed storage period and variety	Storage temperature	Stand at designated periods from cut seed stored in—									Stand from seed stored in medium humidity and cut immediately before planting		
		Low humidity			Medium humidity			High humidity					
		18 days	30 days	36 days	18 days	30 days	36 days	18 days	30 days	30 days	18 days	30 days	36 days
21 days:	°F.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Irish Cobbler	32	59.7	91.4	95.5	55.6	92.5	95.1	72.8	92.9	97.0	60.8	92.2	94.4
	40	51.9	89.9	80.9	52.6	90.7	91.4	84.3	91.8	98.5	74.7	93.5	96.3
	50	79.1	91.0	91.0	82.1	93.6	94.9	84.	95.5	98.1	77.2	94.0	96.3
Triumph	32	16.7	63.1	68.6	13.4	77.2	86.2	39.2	85.4	88.5	38.4	86.2	91.0
	40	32.8	88.1	88.1	34.3	87.3	92.2	50.3	92.1	94.8	54.3	88.8	92.2
	50	56.0	81.0	84.7	66.0	85.4	87.3	93.7	94.0	99.2	78.4	92.5	93.6
Green Mountain	32	10.4	75.7	81.0	12.7	76.0	83.2	26.5	89.9	93.6	17.2	72.0	75.7
	40	36.2	84.7	85.8	29.5	79.5	83.2	56.3	92.9	93.3	57.1	85.5	88.4
	50	39.9	86.2	87.6	52.2	90.3	93.7	83.6	97.4	99.2	69.0	87.3	90.2
Russet Rural	32	3.7	28.4	59.3	3.0	41.0	66.4	5.6	39.2	67.5	4.3	32.5	66.8
	40	5.6	38.1	71.7	5.6	39.6	84.0	12.3	53.7	84.7	9.7	44.8	80.7
	50	6.4	41.0	78.7	6.7	44.8	86.9	19.9	54.9	88.8	22.0	57.5	91.0
9 days:													
Irish Cobbler	32	56.0	90.7	91.8	53.7	91.0	94.4	69.8	92.9	93.3	66.0	91.4	94.8
	40	64.6	87.8	94.4	67.2	92.9	97.3	80.2	97.8	97.8	74.7	93.5	96.3
	50	76.1	91.4	97.3	69.0	87.3	93.3	84.3	95.1	97.8	74.0	89.9	97.0
Triumph	32	26.5	77.0	84.3	21.6	79.5	84.0	40.0	82.)	88.5	51.1	92.5	95.1
	40	47.8	85.8	88.5	38.1	87.3	92.2	54.5	91.0	90.7	54.3	88.8	92.2
	50	58.2	92.5	94.4	66.0	93.3	95.5	77.3	94.0	96.6	61.6	86.9	92.2
Green Mountain	32	19.0	72.0	81.3	22.0	86.9	90.7	37.7	84.7	91.8	35.8	89.6	91.8
	40	34.0	91.0	96.3	35.4	82.8	93.7	56.4	95.5	97.3	57.1	85.5	88.4
	50	48.1	94.4	95.1	50.4	97.0	98.0	72.8	95.1	97.8	70.5	95.1	95.9
Russet Rural	32	4.0	39.6	68.7	4.9	37.3	77.2	9.7	48.9	84.7	7.8	40.7	71.3
	40	8.2	42.2	91.4	9.0	52.6	90.3	11.2	47.8	90.7	9.7	44.8	80.7
	50	6.3	49.3	86.9	6.0	51.1	87.7	25.4	49.3	92.2	9.7	48.5	86.9

A study of table 4 and figures 1 to 8 indicates that the percentage of hills showing growth above the surface of the ground 18 days after planting is much greater with all varieties at all temperatures when the cut seed pieces were stored at high relative humidity. This applies to seed stored both for 21 days and 9 days before planting. The results from those lots stored at intermediate and at low humidity were somewhat similar. In addition, a larger percentage of germination is shown under all humidity conditions from seed stored at 50° F.; in nearly all instances the lowest germination was from those stored at 32°. Thirty days after planting, Irish Cobbler, Triumph, and Green Mountain varieties showed practically as many germinated hills as on 36 days when the final counts were made. Germination was much slower with all lots of the Russet Rural variety, and a satisfactory stand never was obtained. This variety seems to be unsuited for the locality in which these experiments were conducted. Freshly cut seed pieces on the whole showed a germination 18 days after planting which was less than that for cut seed stored at high humidity but greater than that from seed stored at either medium or low humidity.

The stand for both years would undoubtedly have been much less in those lots of seed stored at the low humidities had not all badly shriveled, moldy, or decayed pieces in these lots been discarded. This culling out was not necessary with seed stored at the other humidities.

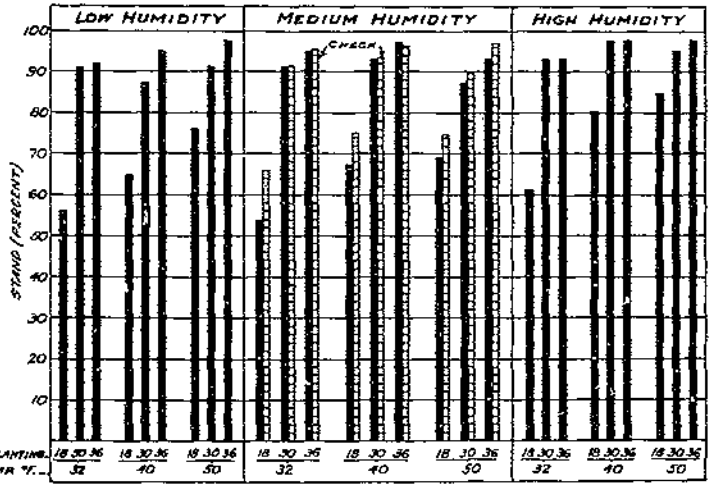

FIGURE 1.—Percentage of stand of late-planted Irish Cobbler seed pieces stored after cutting at different temperatures and humidities for 9 days, as compared with the stand from seed stored whole in medium humidity and cut immediately before planting. Stand records taken 18, 30, and 36 days after planting.

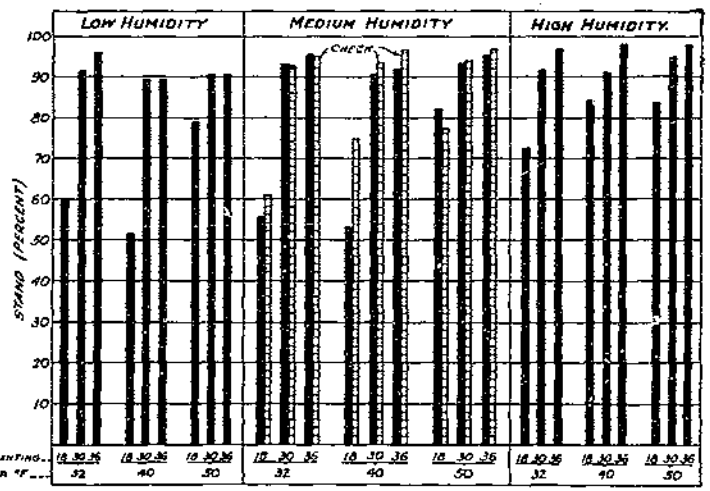

FIGURE 2.—Percentage of stand of late-planted Irish Cobbler seed pieces stored after cutting at different temperatures and humidities for 21 days, as compared with the stand from seed stored whole in medium humidity and cut immediately before planting. Stand records taken 18, 30, and 36 days after planting.

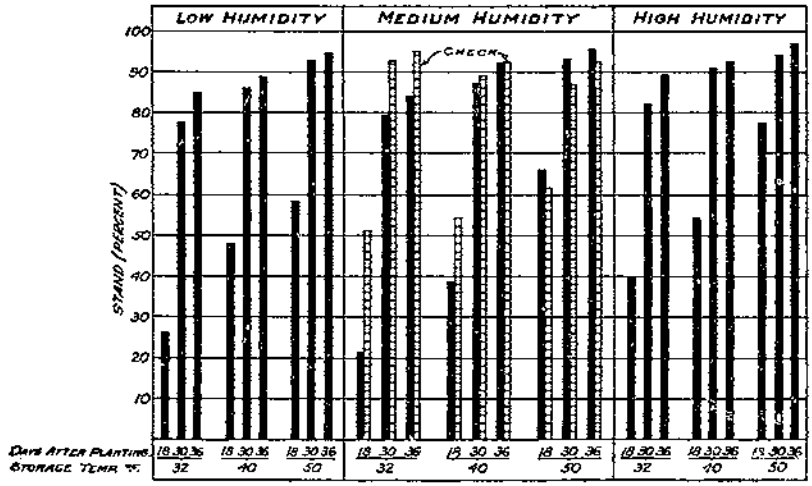

FIGURE 3.—Percentage of stand of late-planted Triumph seed pieces stored after cutting at different temperatures and humidities for 9 days, as compared with the stand from seed stored whole in medium humidity and cut immediately before planting. Stand records taken 18, 30, and 36 days after planting.

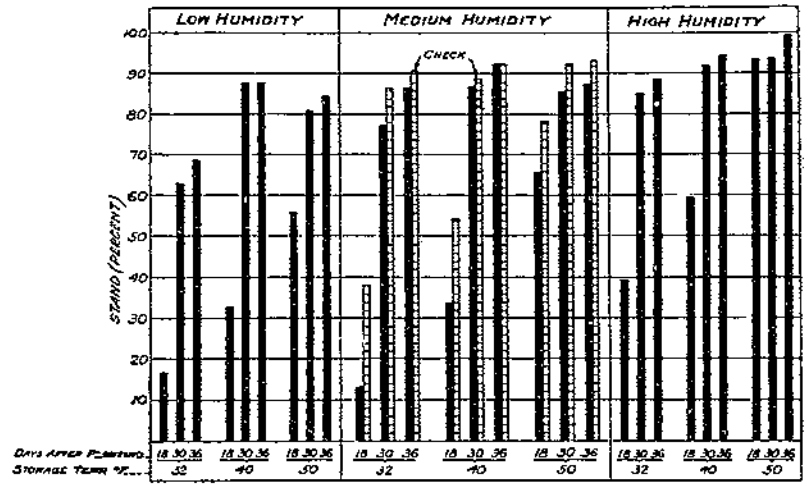

FIGURE 4.—Percentage of stand of late-planted Triumph seed pieces stored after cutting at different temperatures and humidities for 21 days, as compared with the stand from seed stored whole in medium humidity and cut immediately before planting. Stand records taken 18, 30, and 36 days after planting.

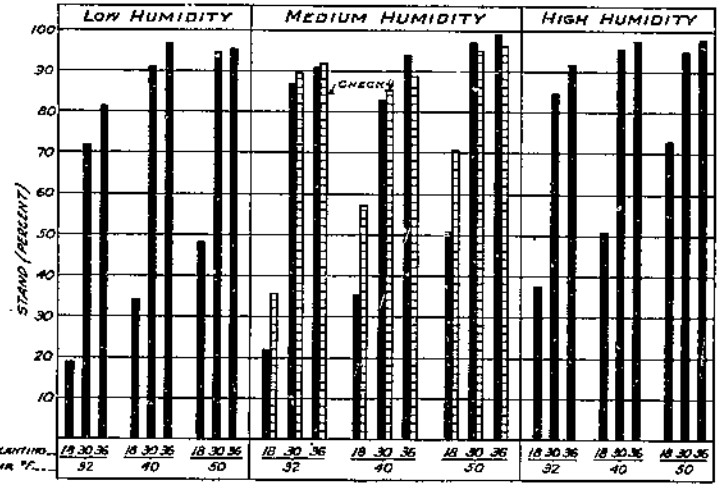

FIGURE 5.—Percentage of stand of late-planted Green Mountain seed pieces stored after cutting at different temperatures and humidities for 9 days, as compared with the stand from seed stored whole in medium humidity and cut immediately before planting. Stand records taken 18, 30, and 36 days after planting.

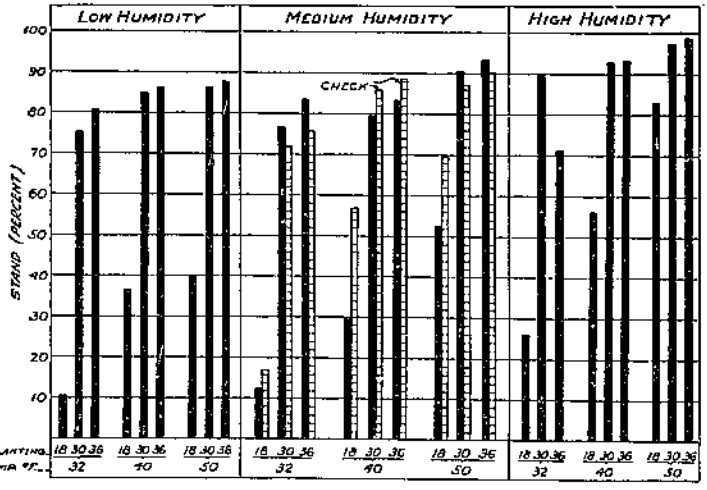

FIGURE 6.—Percentage of stand of late-planted Green Mountain seed pieces stored after cutting at different temperatures and humidities for 21 days, as compared with the stand from seed stored whole in medium humidity and cut immediately before planting. Stand records taken 18, 30, and 36 days after planting.

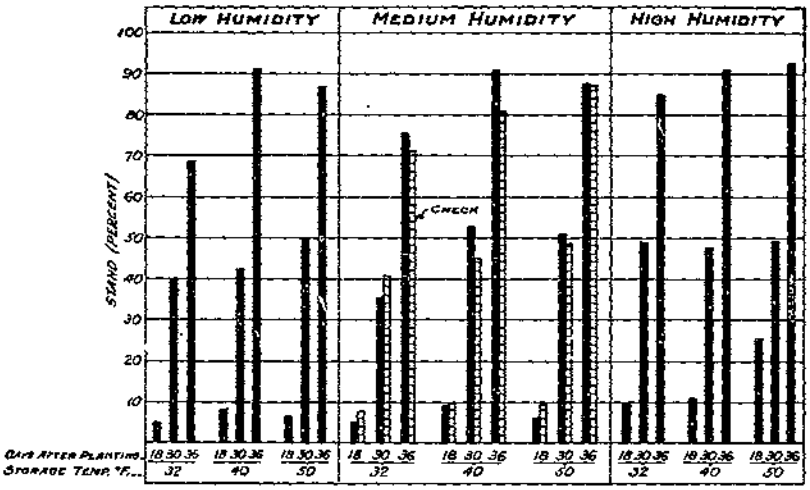

FIGURE 7.—Percentage of stand of late-planted Russet Rural seed pieces stored after cutting at different temperatures and humidities for 9 days, as compared with the stand from seed stored whole in medium humidity and cut immediately before planting. Stand records taken 18, 30, and 36 days after planting.

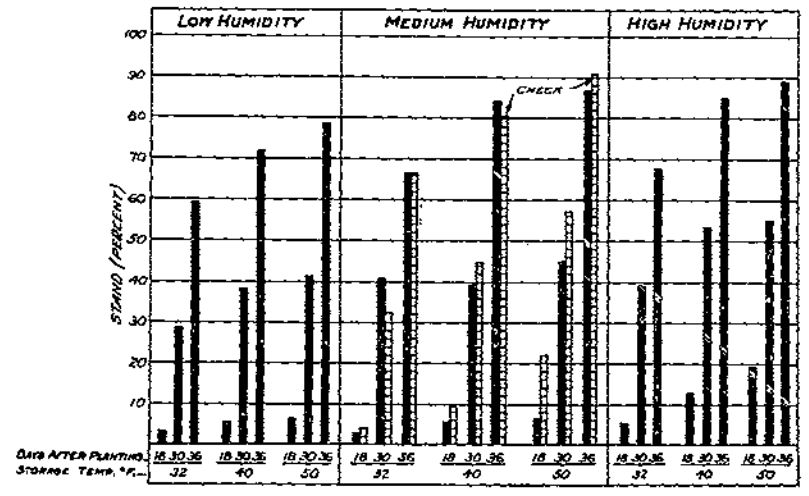

FIGURE 8.—Percentage of stand of late-planted Russet Rural seed pieces stored after cutting at different temperatures and humidities for 21 days, as compared with the stand from seed stored whole in medium humidity and cut immediately before planting. Stand records taken 18, 30, and 36 days after planting.

YIELDS

The average yields of both U.S. Grade No. 1 and U.S. Grade No. 2 potatoes from the early and late crops calculated on the acre basis are presented in tables 5 and 6. The summary, which is an average of all varieties of both the early and late crops of 1926 and 1927, is shown in table 7. The discussion of results will not include the yield of U.S. Grade No. 2 potatoes, as these yields proved to be inconsistent and of little significance. The weather conditions for a good potato crop at

the Arlington Experiment Farm were exceedingly unfavorable during 1926. A poor and in some instances an inconsistent yield was obtained from both the early and late plantings.

Comparing the average yields of all varieties for both 1926 and 1927, as is seen in table 7, there is shown in all but one instance a general increase in yield as the temperature at which the cut seed was stored increased from 32° to 50° F. and as the relative humidity increased from low through intermediate to high. Comparison was made of the differences in the yields in 1927 from stored seed pieces and pieces which were cut immediately before planting. In practically all instances the cut seed that was stored in medium and high humidity gave a greater yield of first-grade potatoes than the freshly cut seed, while from the low humidities the yield in many instances was not so good as from freshly cut seed.

The results of 1926 and 1927 in general showed an increasing stand and yield as the storage conditions of the cut seed increased in humidity from 70 to 95 percent and as the temperature increased from 32° to 50° F.

TABLE 5.—*Average acre yields in the 1926 early and late crops of potatoes from seed pieces stored after cutting at different temperatures and relative humidities for various periods of time*

Planting and variety	Storage period after cutting	Storage temperature	Yield from cut seed stored in—					
			Low humidity		Medium humidity		High humidity	
			U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2
Early:	*Days*	*° F.*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
Irish Cobbler	25	32	103.0	16.2	117.2	13.8	123.8	19.0
		40	116.5	12.0	117.8	10.0	104.7	22.8
		50	100.5	34.3	97.0	21.6	138.1	21.5
Triumph	25	32	63.7	22.8	78.0	17.5	99.5	24.0
		40	81.0	18.8	69.5	21.7	98.2	23.2
		50	72.0	16.5	60.0	20.3	88.7	14.3
Irish Cobbler	14	32	97.2	18.0	105.7	21.7	124.7	19.7
		40	121.0	14.5	113.3	17.2	131.0	13.8
		50	97.5	14.0	91.5	14.3	111.3	12.7
Triumph	14	32	66.2	14.8	54.3	22.7	85.2	17.8
		40	72.7	20.8	80.2	18.8	96.7	14.0
		50	86.5	17.5	96.0	23.3	97.3	17.8
Late:								
Irish Cobbler	20	32	136.2	5.2	165.8	6.7	159.0	10.3
		40	129.3	14.7	151.7	9.2	134.5	9.5
		50	111.7	8.2	144.3	8.7	144.3	6.1
Triumph	20	32	56.3	22.3	76.7	13.3	75.3	12.0
		40	58.8	14.2	83.3	13.5	94.3	8.8
		50	69.8	14.3	99.2	12.0	89.0	11.7
Green Mountain	20	32	155.0	29.1	170.1	23.2	168.7	25.3
		40	122.3	19.2	155.8	27.0	180.0	29.3
		50	141.5	21.3	214.7	26.5	202.3	26.6
Russet Rural	20	32	82.0	19.8	87.8	15.2	95.0	15.7
		40	80.0	11.0	84.3	13.8	117.0	18.5
		50	97.6	18.3	104.8	12.7	134.2	14.2
Irish Cobbler	11	32	130.8	5.7	108.8	5.2	118.8	9.3
		40	117.7	7.8	113.0	4.7	116.3	5.5
		50	117.1	4.0	120.5	4.7	114.7	5.0
Triumph	11	32	57.3	12.8	82.3	13.3	61.0	9.7
		40	67.5	15.0	83.8	14.5	77.2	16.2
		50	62.5	9.0	75.3	10.0	75.2	12.5
Green Mountain	11	32	191.0	19.2	180.0	21.7	161.5	14.3
		40	153.0	19.0	164.0	22.7	159.5	17.0
		50	154.2	14.2	176.5	22.8	181.2	19.7
Russet Rural	11	32	78.8	12.5	88.2	15.2	104.3	11.8
		40	81.8	14.3	112.0	17.5	119.5	16.0
		50	109.2	13.7	104.0	13.3	115.3	16.2

TABLE 6.—*Average acre yields in the 1927 early and late crops of potatoes from seed pieces stored after cutting at different temperatures and relative humidities for different periods of time, as compared with the yields from seed stored whole in medium humidity at the same temperatures and cut immediately before planting*

Planting and variety	Storage period after cutting	Storage temperature	Yield from cut seed stored in—						Yield of tubers stored at medium humidity and cut immediately before planting	
			Low humidity		Medium humidity		High humidity			
			U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2
Early:	*Days*	° *F.*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
Irish Cobbler	20	32	304.3	50.8	311.7	75.1	332.4	62.8	320.7	62.5
		40	353.2	58.8	357.9	65.2	354.6	67.0	346.5	57.9
		50	327.3	59.4	351.0	78.0	369.8	73.5	361.8	61.9
Triumph	20	32	213.6	50.3	270.0	55.8	270.9	51.1	279.5	49.7
		40	287.9	45.8	299.7	61.2	298.7	51.3	301.4	48.8
		50	255.0	53.5	305.4	57.2	349.0	67.6	318.1	53.4
Irish Cobbler	12	32	309.1	65.8	321.4	79.3	330.0	66.3	311.0	64.1
		40	323.0	69.7	322.7	60.0	336.9	75.0	322.4	62.4
		50	344.0	71.7	353.1	76.2	372.3	72.1	350.1	64.3
Triumph	12	32	286.5	61.0	274.2	46.5	303.8	57.7	255.6	58.2
		40	289.6	48.6	317.4	54.1	388.1	53.7	301.4	50.0
		50	298.8	70.8	325.2	62.1	321.8	64.6	308.9	50.0
Late:										
Irish Cobbler	21	32	224.9	33.8	229.9	31.8	267.7	35.0	264.5	29.3
		40	211.5	40.5	198.7	46.0	268.9	34.6	273.6	42.8
		50	219.1	37.5	240.9	42.9	264.0	42.2	222.4	36.[illegible]
Triumph	21	32	127.9	33.6	145.5	56.7	172.7	48.9	169.5	45.5
		40	154.6	51.4	163.4	53.1	183.0	51.5	174.7	57.0
		50	162.0	45.3	191.7	55.1	203.1	52.0	198.2	36.4
Green Mountain	21	32	207.5	34.7	177.0	18.7	241.2	36.6	195.8	19.1
		40	233.2	32.4	223.7	24.9	240.9	35.1	223.3	26.4
		50	237.8	35.1	230.3	28.9	291.7	34.6	245.6	27.0
Russet Rural	21	32	134.7	5.5	158.5	7.5	161.0	6.4	168.5	9.2
		40	161.2	4.5	178.1	8.2	183.4	8.6	175.0	8.9
		50	168.9	11.5	187.3	14.6	209.1	14.2	200.7	16.3
Irish Cobbler	9	32	249.0	36.3	244.7	50.1	272.1	34.3	242.1	33.0
		40	223.0	44.6	255.1	34.1	257.0	44.6	259.5	45.6
		50	223.8	33.0	228.2	37.5	240.7	43.7	226.0	41.2
Triumph	9	32	146.5	52.2	183.6	40.6	155.1	47.4	172.1	46.2
		40	182.3	50.9	176.4	54.3	172.8	52.2	166.2	45.5
		50	155.6	54.2	169.0	52.3	201.7	40.9	173.4	41.2
Green Mountain	9	32	222.0	23.3	244.8	31.8	256.9	26.7	224.9	27.4
		40	240.0	29.1	241.6	33.0	251.2	31.8	220.8	30.9
		50	246.8	31.0	238.7	36.4	264.7	31.1	251.2	26.9
Russet Rural	9	32	173.2	11.0	181.4	10.6	175.2	[illegible]1.2	141.4	10.5
		40	192.2	9.7	196.5	13.5	205.9	18.9	194.0	13.7
		50	189.2	17.8	197.4	16.6	220.5	13.0	187.3	10.1

TABLE 7.—*Average acre yields in 1926 and 1927 of five varieties of potatoes from seed pieces stored after cutting at different temperatures and relative humidities*

Storage temperatures	Yield from cut seed stored in—					
	Low humidity		Medium humidity		High humidity	
	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
32° F.	146.0	27.0	169.1	28.9	178.2	27.6
40° F.	169.1	27.8	179.8	29.3	184.4	29.8
50° F.	162.8	29.4	182.1	30.9	200.0	30.7

INVESTIGATIONS IN 1928

The work during the previous years indicated that a high storage humidity was more desirable for the storage of cut seed pieces. Moreover, it also seemed desirable to store seed at a range of higher temperatures than was previously used. In the 1928 investigations storage temperatures of 40°, 50°, 60°, and 70° F., with a high relative humidity of from 90 to 95 percent at each temperature, were used for the cut seed pieces. An early and a late planting were made, as in the previous investigations. The early planting consisted of two lots of the Irish Cobbler variety. The seed stock for one lot was harvested at the Arlington farm the previous November and held in storage at 36° until needed. The seed stock for the other lot consisted of certified Irish Cobbler seed grown on Prince Edward Island, Canada, and was purchased from a local dealer just before it was needed. The storage history of these potatoes is not known, but they were entirely dormant when received. Part of the home-grown lot was cut on March 22 and, together with lots of uncut potatoes, was stored at 40°, 50°, 60°, and 70° until April 6, making a total of 15 days in storage, when all lots were planted. The Canadian potatoes were all cut and stored at the same time, but no check lots were available to cut immediately before planting. These were cut and handled with the home-grown lot. Counts to determine the stand were made 52 days after planting. The matured crop was harvested on August 7.

The late planting consisted of Irish Cobbler and Green Mountain varieties from seed stock grown at the Arlington farm, which had been held in storage at 36° F. from harvest time. Cut and uncut lots of this stock were prepared and put in storage at the different temperatures on July 11. These were removed from storage July 18, making a storage period of 7 days. The count to determine the stand was made after 35 days, and the crop was harvested November 9, after the plants had been killed by frost although the tubers were well matured.

During the growing season a distinct difference in growth, affecting both early and late plantings, was apparent between the rows of plants from stored seed pieces and those from seed cut just before planting. Sprouts from the former seed appeared above the soil earlier and a difference in size of the plants in favor of these was apparent for 6 to 8 weeks. As the plants became larger the difference became less marked. The plants from the stored seed pieces came into bloom earlier and matured a week to 10 days earlier. When the plants and leaves were practically all dead the leaves on the check-rows were just beginning to die. These results appear to be contradictory to those reported by Rosa,[4] who states that both a retardation in rate of germination and an increase in seed-piece decay took place when seed was cut and stored previous to planting.

RESULTS WITH EARLY PLANTING

The average percentage of stand calculated from a count made 52 days after planting and the yields from both locally grown and Canadian seed are given in table 8. Practically no difference in stand is noted among the various lots of seed.

[4] ROSA, J. T. RELATION OF TUBER MATURITY AND OF STORAGE FACTORS TO POTATO DORMANCY. Hilgardia 3: 99–124, illus. 1928.

TABLE 8.—*Acre yields and percentage of stand from early planted locally grown and Canadian grown Irish Cobbler potatoes stored at various temperatures with a high relative humidity for 15 days after cutting, as compared with seed stored whole under the same conditions and cut immediately before planting, 1928*

Storage temperature of both whole and cut seed	Stand and yields from seed cut and stored before planting						Stand and yields from seed stored whole and cut immediately before planting, locally grown		
	Locally grown			Canadian					
	Stand	Yield		Stand	Yield		Stand	Yield	
		U.S. Grade No. 1	U.S. Grade No. 2		U.S. Grade No. 1	U.S. Grade No. 2		U.S. Grade No. 1	U.S. Grade No. 2
	Percent	*Bushels*	*Bushels*	*Percent*	*Bushels*	*Bushels*	*Percent*	*Bushels*	*Bushels*
40° F.	98.5	233.5	46.7	97.6	178.0	36.4	96.1	242.5	39.4
50° F.	99.3	314.0	61.4	96.6	225.1	37.0	99.0	338.8	62.5
60° F.	98.5	367.9	69.3	96.6	236.1	45.4	98.1	343.2	64.5
70° F.	98.5	356.8	67.7	97.2	232.0	39.1	99.3	274.8	46.8
Average	98.7	318.0	61.3	97.0	217.8	39.5	97.9	299.8	53.3

Comparing the results with seed pieces from the different storage temperatures, the records show a definite increase in yield of both U.S. Grade No. 1 and U.S. Grade No. 2 potatoes, as the storage temperature increased from 40° to 60° F., with a dropping off in yield from the 70° storage. These results apply both to the seed cut before the storage period as well as the checks cut just before planting. With the lot of seed grown at Arlington farm, where a comparison was made between different storage temperatures, there was a better yield from cut seed stored at 60° and 70° than from cut seed stored at 40° and 50°, indicating an injurious effect from the two lower temperatures. Comparing the yield from stored cut seed with that from the checks, it will be noted that in general there was a smaller yield from seed stored at 40° and 50° than from the checks, probably due to this injurious effect, whereas the yield from the cut seed stored at 60° and 70° was greater than that from the checks.

RESULTS WITH LATE PLANTING

No consistent differences in stand in late-planted Irish Cobbler and Green Mountain varieties were shown between the different lots of each variety. The average percentage of stand of all lots of stored cut seed of the Irish Cobbler was 98.7; of the Green Mountain, it was 95.5; for seed cut just before planting it was 97.9 for the Irish Cobbler and 93.9 for the Green Mountain varieties.

The average yields of the various lots are given in table 9. Here practically the same relations are shown as in the early planting. With the Irish Cobbler variety, the largest yield was obtained from the lots stored at 60° F., while with the Green Mountain variety a slightly larger yield of grade 1 potatoes was obtained from the 50° storage but the total yield of grades 1 and 2 was greatest from the 60° storage lot. Seed pieces of the Irish Cobbler variety stored at 40° and 50° gave in general a smaller yield than seed cut just before planting, while from 60° and 70° the yield was greater from stored cut seed. With the Green Mountain variety the stored cut seed gave the larger yield of no. 1 potatoes per acre from all temperatures.

TABLE 9.—*Acre yields from late-planted Irish Cobbler and Green Mountain potatoes stored at various temperatures for 7 days after cutting, as compared with seed stored whole under the same conditions and cut immediately before planting, 1928*

Storage temperature of both whole and cut seed	Yields from seed cut and stored before planting				Yields from seed stored whole and cut just before planting			
	Irish Cobbler		Green Mountain		Irish Cobbler		Green Mountain	
	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
40° F.	233.5	46.7	167.0	34.4	242.5	39.4	159.7	41.7
50° F.	314.0	61.4	176.2	32.9	338.3	62.5	166.4	45.2
60° F.	367.9	69.3	170.8	45.0	343.2	64.5	166.0	37.2
70° F.	356.8	62.7	172.8	42.9	274.8	46.8	155.0	43.7
Average	318.0	60.0	171.7	38.6	299.7	53.3	161.8	41.9

A general conclusion from this season's results with the two varieties studied is that potato seed cut and stored before planting at temperatures between 50° and 60° F. yielded somewhat better than seed stored either above or below this temperature range, and further that this seed yielded somewhat better than seed cut immediately before planting.

INVESTIGATIONS IN 1929

Only a late planting was made in 1929, and this was from seed handled similarly to that of the 1928 crops. The seed used was of the Irish Cobbler and Green Mountain varieties harvested at the Arlington farm the previous autumn. These potatoes had been held throughout the winter at 40° F. until March, when they were treated for surface diseases and transferred to 36° to keep them dormant until planting time. Lots of the two varieties were cut and, together with duplicate uncut lots, were put in storage at 40°, 50°, 60°, and 70° with a high relative humidity for 16 days before planting. All lots were planted July 20 and harvested November 7.

This planting was made during a period of drought and abnormally high temperature. The soil was moderately dry at this time, and no rain occurred for about 2 weeks after planting. A count to determine the stand of the respective lots was made 35 days after planting. The average results in percentage of stand are given in table 10. In nearly every lot of both varieties a slightly better stand was apparent from the stored cut seed, indicating an advantage in this treatment of seed when planted under hot, dry conditions.

TABLE 10.—*Percentage of stand from late-planted Irish Cobbler and Green Mountain potatoes stored at various temperatures with a high relative humidity for 16 days after cutting, as compared with that from seed stored whole and cut just before planting, 1929*

Storage temperature of both whole and cut seed	Stand from seed cut and stored before planting		Stand from seed stored whole and cut just before planting	
	Irish Cobbler	Green Mountain	Irish Cobbler	Green Mountain
	Percent	*Percent*	*Percent*	*Percent*
40° F.	75.7	54.9	76.2	51.4
50° F.	75.5	55.8	75.0	55.1
60° F.	72.0	61.1	71.5	56.0
70° F.	74.1	60.0	66.4	56.0
Average	74.5	59.4	72.5	54.6

The average yields of all lots are given in table 11. In all but one instance a considerably better yield of no. 1 potatoes was obtained from the stored cut seed pieces. This was more marked in seed from the lower storage temperatures. In comparing the respective preliminary storage temperatures of seed the results appear to be erratic, making any definite conclusions unsafe.

TABLE 11.—*Acre yields from late-planted Irish Cobbler and Green Mountain potato seed pieces stored at various temperatures for 16 days after cutting, as compared with seed stored whole under the same conditions and cut immediately before planting, 1929*

Storage temperature of both whole and cut seed	Yields from seed cut and stored before planting				Yields from seed stored whole and cut just before planting			
	Irish Cobbler		Green Mountain		Irish Cobbler		Green Mountain	
	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
40° F.	133.9	22.7	122.9	28.9	110.1	23.9	102.3	27.9
50° F.	117.2	23.6	128.1	25.7	109.6	20.1	106.6	30.0
60° F.	115.6	18.9	123.1	27.3	99.5	20.3	93.9	25.4
70° F.	125.1	19.6	134.4	26.3	131.4	17.1	103.9	29.6
Average.	122.9	21.2	127.1	27.0	112.6	20.3	101.7	28.2

INVESTIGATIONS IN 1930

The handling of the seed stock in 1930 was largely a repetition of the methods used in former seasons. This repetition was followed to verify former results and to spread the investigations over as wide a variety of seasonal conditions as possible. However, this season proved an exception to the usually anticipated conditions, as will be pointed out later.

For the early planting, Irish Cobbler potatoes were grown at the Arlington farm from the crop that had been harvested the previous autumn. The general stock of seed had been stored after harvest at 40° F. until March 26, when it was removed from storage. The following day uniform lots of cut seed with checks of whole seed were put in storage at 40°, 50°, 60°, and 70° for 15 days. These lots were taken from storage and planted April 11. After the month of April practically no rain fell during the entire summer and fall. However, there seemed to be enough reserve moisture in the soil to mature a fair crop from early-planted seed. On June 11 a count of the growing hills was made, which showed a stand varying from 73.7 to 75.4 percent, with no consistent difference between lots apparent.

The crop was harvested July 31 and the yield from the various lots is reported in table 12. While these results show an increase in yield as the storage temperature of the seed was increased from 40° to 70°, in general they also show a somewhat larger yield from seed cut just before planting.

TABLE 12.—*Acre yields from early-planted Irish Cobbler potato seed pieces stored at various temperatures with a high relative humidity for 15 days after cutting, as compared with seed stored whole under the same conditions and cut immediately before planting, 1930*

Storage temperature of both whole and cut seed	Yields from seed cut and stored before planting		Yields from seed stored whole and cut immediately before planting	
	U.S. Grade No. 1	U.S. Grade No. 2	U.S. Grade No. 1	U.S. Grade No. 2
	Bushels	*Bushels*	*Bushels*	*Bushels*
40° F.	85.6	19.6	97.2	23.3
50° F.	104.1	22.8	113.5	21.7
60° F.	122.5	24.1	126.4	28.8
70° F.	133.7	27.9	138.5	27.9
Average	111.5	23.6	118.9	25.4

The late planting in 1930 suffered from a condition rarely encountered in growing potatoes, since, as has been noted, practically no rain fell after the month of April. This drought with abnormally high temperatures lasted until late fall. The Green Mountain variety only was planted. The usual lots of seed, after a 12-day preliminary storage at 40°, 50°, 60°, and 70° F., were planted July 22. As would be expected, growth was very slow, but sprouts from the stored cut seed pieces appeared first above the soil. The growth from all lots was very weak and abnormal and never reached a height of over 9 to 12 inches. An examination showed so few plants had set any tubers that no attempt was made to harvest the planting. A count of the hills of growing plants taken 50 days after planting gives the only comparative record of this crop. The average percentage of stand is given in table 13. Examination of these results shows little difference in stand from cut seed stored at 50°, 60°, or 70°, but from cut seed stored at 40° the stand was less. A comparison of results from stored cut seed with seed cut just before planting shows a general increase in stand from the former class, except from seed stored at 40°.

TABLE 13.—*Percentage of stand from late-planted Green Mountain potatoes stored at various temperatures for 12 days after cutting as compared with whole seed held under the same conditions and cut just before planting (1930)*

Storage temperature of both whole and cut seed	Stand from seed cut and stored before planting	Stand from seed stored whole and cut just before planting	Storage temperature of both whole and cut seed	Stand from seed cut and stored before planting	Stand from seed stored whole and cut just before planting
	Percent	*Percent*		*Percent*	*Percent*
40° F.	41.0	41.2	60° F.	50.0	17.7
50° F.	52.1	31.2	70° F.	50.7	31.5

SUMMARY AND CONCLUSIONS

Many potato growers consider it of economic advantage to cut potatoes into seed pieces in advance of planting time because of the better distribution of labor that this practice affords.

Frequently growers meet with loss because of improper methods of storing or handling cut seed.

There is no uniformity in the methods of handling and storage of cut seed potatoes, and considerable uncertainty exists as to the best procedure. The investigations described herein were undertaken to determine the most favorable conditions under which to store cut seed.

These investigations, which were carried on at the Arlington Experiment Farm in Virginia near Washington, D.C., indicate that a satisfactory healing or corking over of the cut surfaces of the seed pieces takes place at a temperature of about 60° F., with high relative humidity. The seed pieces held under these conditions remained firmer, were generally free from mold growth, and the cut surfaces were less easily cracked in handling.

A general comparison of the results obtained from cut seed pieces stored for a preliminary period before planting with whole seed held under the same conditions and cut just before planting shows that in most instances as good and in some cases better yields were obtained from the stored cut seed. These lots of seed usually produced quicker and more vigorous growth, with from 7 to 10 days earlier maturity. Casual observations of the tubers produced also showed more uniformity in size with fewer oversized specimens.

It should be emphasized that the results reported herein were obtained from work done at one location, and somewhat different results might be obtained under different soil and climatic conditions. With this in mind the following suggestions are made for the benefit of the grower who desires to cut his seed in advance of planting time:

Seed potatoes should be treated or disinfected to destroy surface-borne disease organisms, and should be dried before cutting.

Cutting should be done with sharp thin-bladed knives to insure smooth cut surfaces.

Cutting should not be done in full sunlight.

The seed should be handled only in clean containers, preferably disinfected with the solution used to treat the potatoes, and stored in a clean location where the walls and floors have been disinfected or fumigated.

Cut seed may be stored in baskets, crates, or barrels. The contents should be poured from one container to another after 24 hours and again after 48 hours, in order to break apart the pieces that stick together.

The cut seed should be stored in a fairly airtight room with a temperature of about 60° F. A humidity of 85 to 90 percent should be maintained. This may be accomplished by wetting the floor or hanging up clean wet sacks around the walls. An earth floor is desirable, as it is easily kept damp.

Cut seed handled and kept under the above conditions may safely be held as long as 10 days before planting. If it is necessary to hold them longer than this the temperature should be lowered to about 40° F., in order to retard sprouting.

It is well to remove the seed from the high humidity to an airy place 2 or 3 days before planting, in order to allow the cut surfaces to dry out and toughen before handling.

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