

The evidence still supports the hypothesis advanced in 1952 (4) that crease-stem occurs during periods of rapid growth and seems to be associated in some way with a temporary shortage at the growing point of one or more minerals. Most of the data accumulated this past year indicate that calcium may be an important factor in this connection.

Our only advice to the commercial grower at the present time is to avoid any possible over-fertilization of the tomato crop during its early stages of growth. Such over-fertilization

would render the plants very susceptible under weather conditions favoring rapid plant growth.

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PREVENTION OF SKINNING OF POTATOES

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Since potato consumption per capita has been falling for many years, every effort should be made by the potato industry to present as attractive a product as possible to the potential consumer. Florida-grown potatoes are attractive when washed and handled properly. However, one defect—skinning or “feathering”—mars the appearance of many of the potatoes produced in some of the production areas. Not only do the skinned potatoes appear untidy due to the bits of protruding skin, but the skinned areas may become discolored. This discoloration ranges from a light brown to a very objectionable dark brown or black.

Aside from what might be termed an esthetic objection, skinning may be the cause of a direct economic loss. The skinned areas may offer a means for soft rot to become established. Since soft rot is a grade defect, a buildup in transit could throw the load out of grade or cause it to be rejected.

Another source of economic loss is the greater loss in weight of skinned potatoes as compared to unskinned ones. In tests at Gainesville, skinned and unskinned potatoes, harvested 92 days after planting, were held at 60° F. for seven days and then at air temperature for two days during May of 1951 and 1953. The average percent loss in weight is given below:

	1951	1953
Skinned	7.3	5.2
Not skinned	4.9	3.1

From the above results it can be seen that the skinned tubers lost 2.4 percent and 2.1 percent more weight in 1951 and 1953, respectively, than those not skinned. These differences were highly significant in 1951 and significant in 1953.

Since skinning occurs mainly during the harvesting and packing operations, any methods to reduce skinning must be applied before or during these operations.

Other states producing early-crop potatoes have recognized the skinning problem and have investigated methods of reducing the amount of skinning. Dietz (1) and Krause (2) of Idaho have reported reductions in skinning when vines were killed 10 to 14 days before harvesting. Kunkel, Edmundson and Binkley (3) got similar results in Colorado.

Studies have been made at Gainesville to determine the effect of vine-killing, delayed harvesting and delayed grading on skinning of potatoes under Florida conditions of spring harvest.

METHODS

To determine the effect of delayed harvest on the incidence of skinning, an experiment was conducted using the Sebago variety in 1951 and 1952 in which the potatoes were dug at five-day intervals beginning 90 days from planting.

Another experiment was conducted in 1951, 1952 and 1953 to determine the effect of vine killing upon skinning of potatoes. In this experiment the amount of skinning was compared at the time of killing the vines and 7 and 14 days later. Non-killed check plots were also dug at each date. The Sebago variety was used all three years and, in addition, the

Red Pontiac variety in 1952. Vines were killed by cutting at the ground level with a knife.

In addition to these field experiments, experiments were conducted in 1951 and 1952 in which the skinning procedure was delayed various lengths of time with the potatoes stored at 60° F. in 1951 and at both 60° F. and room temperature in 1952.

The potatoes were handled in a similar manner each year, with the planting date being about the second week in February and harvesting beginning in the middle of May.

The plots were laid out in approved statistical designs prior to making treatments with five replications in most of the field experiments. The plots were harvested by 8:30 a.m. in most cases and the skinning tests begun immediately. The method of skinning was as follows: Fifteen tubers about five ounces in size were washed and placed in a skinning apparatus consisting of a garbage can lined with 1/2 inch mesh hardware cloth. The can was rotated for 3 minutes on rolls¹ at about 10-11 revolutions per minute. Each tuber in the sample was rated individually using a rating system of 1 (the least skinning) to 5 (the most skinning). A weighted rating was obtained by multiplying the number of tubers in each rating by the rating and taking the average. In most cases duplicate samples were used and these were averaged.

RESULTS

Effect of delayed harvest:—In both the 1951 and 1952 seasons delaying the harvest markedly reduced the amount of skinning (Table 1). In 1951 there was no difference between 105 and 110 days while in 1952 the amount of skinning was lower at 110 days than at 105.

Table 1. The effect of delay in harvest on skinning of potatoes in 1951 and 1952. The figures are based on a rating of 1 (least skinning) to 5 (most skinning).

Year	Harvest date in days from planting				
	90	95	100	105	110
1951	4.0	3.9	3.3	2.3	2.2
1952	4.3	3.1	2.7	2.5	1.8
L.S.D. 1951	.01 level	0:51			
1952	.01 level	0.51			

Effect of vine killing:—In 1951 and 1952 vine killing was effective in reducing the amount of skinning (Table 2), with the great-

est reduction at 14 days after killing the vines. There was, of course, no reduction when the potatoes were harvested immediately after killing the vines. Each year there was a reduction in skinning due to vine killing and also due to delayed harvest.

No difference was found in skinning between the two varieties Sebago and Red Pontiac. The figures for 1952 in Table 2 are an average of the two varieties. The interaction between the two factors was significant, indicating that the combination of delayed harvest and vine killing reduced skinning more than either alone.

In 1953 the vines were in poor condition due to bacterial diseases. No response to vine killing was obtained although the amount of skinning was markedly reduced by delaying the harvest for seven days.

Effect of delayed grading:—Holding potatoes for 24 hours after harvest reduced the amount of skinning significantly in all cases (Table 3) but the reduction was not as great as received from delayed harvesting and vine killing. Holding the potatoes longer than 24 hours produced a significant reduction over

Table 2. The effect of vine killing and delayed harvest on skinning of potatoes. The figures are based on a rating of 1 (least skinning) to 5 (most skinning).

Treatment	Days from vine killing*			Average
	0	7	14	
1951				
Vines killed	3.9	3.0	1.5	2.80**
Vines not killed	4.0	3.3	2.4	3.23
Average	3.95	3.15**	1.95**	
1952				
Vines killed	3.4	2.2	1.2	2.29**
Vines not killed	3.3	2.8	1.9	2.67
Average	3.35	2.50**	1.55**	
1953				
Vines killed	2.7	1.9	—	2.3
Vines not killed	2.7	1.7	—	2.2
Average	2.70	1.80**	—	

* 1951 and 1952: 92, 99 and 106 days from planting date.

1953: 90, and 97 days from planting date.

** Differences significant at .01 level.

the 24-hour period only in the third test. It appears here that the reduction was delayed when held at room temperature as compared to 60° F. since the potatoes were from the same lot.

It must be realized that holding the potatoes after harvest will not have an effect on skinning occurring in the digging, bagging and hauling operations.

¹/A machine built by W. B. Coleman for use in extracting insecticide residues.

Table 3. The effect of delaying the skinning operation for various periods after harvest upon the skinning of potatoes. The figures are based on a rating of 1 (least skinning) to 5 (most skinning).

Hours from Harvest	Age of vines at harvest			
	92 days (1)	106 days (2)	90 days (3)	90 days (4)
0	4.0	2.4	4.4	4.4
12	—	—	4.2	4.0
24	3.4	1.9	4.0	3.7
30	—	2.0	—	—
36	—	2.0	3.7	3.8
48	3.1	—	—	—
72	3.2	—	—	—
96	3.0	—	—	—
L. S. D. .05 level	.44	.35	.17	.38
L. S. D. .01 level	.59	—	.24	—

(1) Stored at 60° F. 1951

(2) Stored at 60° F. 1951

(3) Stored at room temperature, 1952

(4) Stored at 60° F. 1952

SUMMARY

All three methods tested for reducing skinning—namely, delayed harvesting, vine-killing and delayed skinning—were effective. Delayed harvesting was quite effective, but was more so when combined with vine-killing. Delaying the skinning operation after harvest to simulate delayed grading was not as effective as the field treatments.

Potatoes harvested 105 days after planting were skinned less than potatoes harvested 100 or less days from planting.

Potatoes harvested from plots in which the vines were killed were skinned less than potatoes harvested from plots in which the vines were not killed. The decrease in skinning

was greater at 14 days after killing the vines than at seven days. From the 1953 results, it appears that vine-killing is not effective if the vines are in poor condition.

Holding the potatoes for 24 hours after harvest resulted in a decrease in skinning, but this decrease was not as great as received from delayed harvesting and vine-killing.

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WHAT CAN THE FLORIDA VEGETABLE INDUSTRY ACCOMPLISH WITH A MARKETING AGREEMENT?

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Provision for agricultural interests to act collectively in solving their marketing problems and improving their economic position has been a matter of Federal legislation for many years. Yet, many agricultural groups still fail to understand the alternative courses of action which may be followed under this law and how these alternatives may be used in solving their marketing problems. The purpose of this paper is to outline the provisions of the Marketing Agreement Act of 1937, and to indicate in a general way what the Florida Vegetable Industry can achieve under its provisions.

CHARACTERISTICS OF THE LEGISLATION

The Marketing Agreement Act recognizes an orderly market for certain agricultural products as essential to the best interests of agriculture and of the national economy. In passing the Act, the declared policy of Congress was to provide a legal basis for the organization of agricultural groups for the purpose of establishing orderly marketing programs and maintaining favorable farm prices. In granting agriculture this privilege, the legislation explicitly protects the consumer by providing that under no circumstances shall programs be used to maintain farm prices above parity levels, and by further providing that upward price adjustments shall be orderly and in conformance with the public interest. Thus, while the legislation furnishes a means by which agricultural groups can act collectively to im-