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To the Graduate Council:

I am submitting herewith a thesis written by Frank D. Williams entitled "Some Effects of Potassium Gibberellate on Sweet Potato Sprout Production." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Horticulture.

Major Professor

Marion E. Hunt

Homer D. Sudds

Accepted for the Council:

Dean of the Graduate School

SOME EFFECTS OF POTASSIUM GIBBERELLATE ON SWEET POTATO SPROUT PRODUCTION

A THESIS

Submitted to
The Graduate Council
of
The University of Tennessee
in
Partial Fulfillment of the Requirements
for the degree of
Master of Science

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by

Frank D. Williams

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F. D. W.

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CHAPTER I

INTRODUCTION

Early planting of sweet potato slips is necessary for maximum yield in the midsouthern and northern sweet potato producing regions of the United States because cool weather limits the length of growing season.

Proximal dominance in sweet potato roots causes the production of slips to be extended over a period of approximately three weeks. For this reason, sweet potato growers must maintain twice as much bed space and bed twice as many roots as would be necessary if all of the slips were produced in a shorter period of time. Alternatively, growers may wait for the slips and accept reduced yields.

Since the gibberellins have affected the growth of many kinds of plants in various ways, including the breaking of apical dominance in plants of some species, this series of trials was undertaken to test some of the effects of potassium gibberellate on sweet potato slip production.

CHAPTER II

REVIEW OF LITERATURE

The yield of sweet potatoes is affected to a large extent by the date of planting.

Regional studies (2) carried on from 1940 to 1942 at four locations (Blacksville, South Carolina; Experiment, Georgia; Laurel, Mississippi and Gilmer, Texas) showed that time of planting significantly influenced total yield. When compared with the earliest planted slips, delays of approximately two weeks, four weeks, six weeks and eight weeks reduced total yield 38, 86, 132 and 188 bushels per acre for the first through the fourth delay respectively. The influence of delayed planting on yield of number one sweet potatoes varied, but delayed planting generally tended to decrease the yield of number one roots

Boswell (5) states that a two week delay in setting sweet potato slips may reduce total yield by thirty to fifty bushels per acre, and yield of the number one grade by twenty to thirty bushels per acre.

Tests at Baton Rouge, Louisiana (13) resulted in the following yields for the planting dates cited: April 27, 631 bushels per acre; May 16, 487 bushels per acre; June 14, 212 bushels per acre and for July 6, 111 bushels per acre.

Cochran (6) states that it would pay to bed enough roots in hotbeds to set the entire acreage shortly after the danger of frost has passed. This statement was made after tests over a three year period had shown a significant decrease in total yield attributable to delayed planting.

Nineteen to fifty bushel decreases in total yield may be expected for each fifteen day delay in planting according to R. E. Wright in a Texas bulletin (22).

Drain, et al, (8) in a Tennessee bulletin, states that the earliest plantings produced the largest yields.

The demand for a large number of sweet potato slips has been shown by several investigators.

Based on a three year regional study (2) Anderson, et al, reports that spacing of sweet potato plants from eight inches to twenty-four inches apart in the row had little effect on total yield, but the yield of the number one grade of sweet potatoes was less at the wider spacing.

Tests conducted in Georgia (6) showed that an eight to twelve inch spacing in the row resulted in a greater total and number one yield.

Recommendations of a twelve inch spacing are found in Mississippi (3) and Tennessee (8) bulletins, and the author of a Texas bulletin (22) recommends spacings of twelve to eighteen inches.

If plants are set twelve inches apart in rows which are forty-two inches apart, approximately 12,500 plants will be required to set an acre. The amount of seedstock and the bedspace required to produce this number of slips is shown in reports by several investigators.

Boswell (5) states that one bushel of roots will produce 1,500 to 2,000 slips over a three week pulling interval, but he recommends bedding ten to twelve bushels of roots for each acre to be planted in order to secure enough plants to set the entire acreage at one pulling.

Only six to eight bushels would have to be bedded for each acre

to be planted if the plants were produced over a three week period.

Wright (22), also, states that one bushel of roots will produce a total of 1,500 to 2,000 slips. He recommends bedding eight bushels for each acre to be planted in order to obtain sufficient slips for an early setting, and three or four bushels for each acre if setting is to be spread over a longer season.

He recommends slightly wider spacings, and fewer slips would be required to set an acre.

Meyer (16) suggests bedding six to ten bushels of roots for each acre to be planted in order to complete the planting with slips produced at the first pulling.

Fifteen to twenty square feet of bed space are required to bed one bushel of roots (16, 22).

Several factors are associated with the slip production per bushel of roots bedded. These factors were discovered in earlier attempts to increase the efficiency of slip production by sweet potato roots.

Early harvested roots were found to produce more slips than late harvested roots, but Edmond and his co-workers (9) suspected that the late harvested roots had been injured by low temperatures prior to harvest. Also, roots stored under recommended conditions produced more slips per bushel than roots stored under unheated conditions.

Cooley and Kushman (7) demonstrated that cool temperatures decreased the slip production by sweet potato roots, even when roots were exposed to temperatures no lower than 50°F.

Anderson (4) compared the effects of careful and commercial handling on the subsequent slip production of sweet potato roots. Carefully handled

roots were placed directly into crates lined with cotton flannel cloth. Commercially handled roots were piled in a center heap row from two rows on each side and then into crates. Carefully handled roots produced 2,129 slips per sixty pound bushel compared to 1,611 slips per sixty pound bushel produced by the commercially handled roots.

Anderson states in a different publication (1) that comparison of the early slip production showed an even greater difference in favor of the carefully handled roots. He also states that small roots produce more slips per bushel of roots bedded than do large roots.

McGinty and Miller (15) found a bed temperature of 85°F. to be more favorable than either higher or lower temperatures for sweet potato slip production.

In 1931, Ross C. Thompson and J. H. Beattie (21) conducted an experiment that demonstrated the existence of proximal dominance in sweet potato roots. The roots, after treatment, were bedded in clean river sand between January 18 and 21. Slip counts were taken March 12.

Roots cut through the middle developed about the same number of slips on each section. The weight of seed stock per plant produced was reduced from nineteen and four tenths grams for whole roots to seventeen grams for roots cut in the middle.

Roots cut in three or four pieces produced about the same number of slips on each of the end sections and fewer slips on the middle sections. The differences could have been related to surface area; because no slips developed on the cut surfaces. Roots which were cut into three pieces produced approximately three times as many slips as the same weight of whole roots.

Roots, which had a three centimeter section removed from the proximal end, developed approximately equal numbers of sprouts on each end, but roots ringed in the middle to a depth of one centimeter still showed proximal dominance.

In 1935, Horsfall (12) used thiourea to destroy proximal dominance in sweet potato roots. Results were variable, and concentrations and length of soaking period appeared to be quite critical.

A Louisiana report (11), published in 1950, showed that 2, 4-D, at a concentration of ten parts per million applied as a dip treatment, was effective in stimulating both early and total slip production by sweet potato roots. Concentration of this chemical was, also, quite critical.

Mitchell and Smith reported in 1952 (17) on the effects of several treatments on a number of different varieties of sweet potatoes. Varietal differences were evident.

A ten parts per million solution of 2, 4-D, and ten and twenty parts per million solutions of 2, 4, 5-T were found effective in increasing slip production. Apparently increased production was due to destruction of proximal dominance. The effective range of concentration was narrow, and injury occurred at relatively low concentrations.

Ethylene chlorohydrin vapor increased slip production by roots of some varieties. On other varieties, severe injury occurred.

Exposure to a temperature of 110°F. for varying lengths of time was effective in increasing slip production by roots of some varieties.

A three hour soaking period in a three per cent soultion of thiourea

or an acetylene solution (eight ounces of calcium carbide in eleven gallons of water) seemed to stimulate sprouting, but these treatments injured the roots.

In all cases increased sprouting appeared to be due to loss of proximal dominance.

Simons (19), in 1952, reported on an attempt to inhibit sprouting by means of chemicals.

A preharvest foliar application of maleic hydrazide resulted in significantly greater slip production when the roots were bedded, but the slips were distorted. No significant differences were obtained when a pre-storage dip treatment was used. Extreme varietal differences in slip production were found in these tests.

Hall and Grieg state, in a 1956 report, (10) that slip production by roots of three varieties of sweet potatoes was increased by an instant dip in a 175 parts per million solution of ethylene chlorohydrin. An instant dip in a ten parts per million solution of 2, 4-D decreased the slip production by roots of one variety. Roots of two varieties produced more, and roots of two other varieties produced fewer slips than the check when soaked three hours in a three per cent solution of thiourea. Increased slip production appeared to be due to loss of proximal dominance, but varietal differences and the critical dosage would tend to make these methods impractical for general use.

The possibility of using one of the gibberellins to hasten sweet potato slip production was suggested by the following reports.

Paul C. Marth and his co-workers (14) treated forty-nine different

plants, representative of various genera, species, varieties and hybrids, with gibberellic acid. Most kinds of plants in this test responded in some way to the treatment.

Differences in response occurred among genera, but responses were similar among species of a genus and among varieties and hybrids.

The most marked response was increased stem elongation. In some of the plants tested, stems elongated at first, but eventually became thicker than the stems of the control plants. The main stems of treated plants elongated first without apparent elongation of the stems in the lateral buds. As the rate of elongation of the main stem decreased, the lateral buds of several kinds of plants, including citrus and snapdragon, elongated in a bushy type of growth.

Leaves of treated plants were usually temporarily a lighter green. In some species, leaves of treated plants were smaller than those of the controls. Leaves of treated plants of other species were larger than normal. Celery petioles were longer and broader on treated plants.

Some treated plants flowered earlier, but pepper plants flowered thirty days later than controls.

No effects were noted on the growth or number of fruits.

The fresh and dry weights of roots were less on treated plants.

A comprehensive review (20), "The History and Physiological Action of the Gibberellins", appears in Volume 8 of The Annual Review of Plant Physiology.

Gibberellin appeared to be effective in breaking the rest period and removing apical dominance in tubers of Solanum tuberosum in tests

conducted by California workers (18).

It was observed that when match sticks were soaked in a gibberellin solution and inserted into resting tubers of Solanum tuberosum, sprouting was hastened by about four weeks.

In subsequent trials, White Rose and Russet Burbank tubers were immersed in solutions containing 0, 25, 50, 500 or 2000 parts per million of gibberellin. The tubers were then held in open flats at controlled temperatures of 50°, 59°, or 77° fahrenheit.

The treated tubers developed sprouts two to three weeks earlier than the controls. Sprouts appeared at all eyes of tubers immersed in the 25, 50 and 500 parts per million solutions but only at the apical eyes of those tubers immersed in the 0 and 2000 parts per million solutions.

Root development was delayed four months at the base of the new sprouts which developed on tubers previously dipped in the 500 parts per million solution.

Other experiments by these workers, showed that duration of immersion of five minutes, ninety minutes or six hours did not significantly influence the rate or nature of sprouting.

Early field studies resulted in even more pronounced stimulation of sprouting, due to a dip treatment, but concentrations as low as ten parts per million were found to be detrimental to plant growth. Severe yellowing and rolling of early leaves; spindly growth of stems; more stems per hill; misshapen tubers appended to elongated underground stems; and reduced yield, but an increased numbers of tubers per hill, were some of the effects attributed to treatment with gibberellin.

Further experiments showed that concentrations as low as 0.5 to 5.0 parts per million were effective in curtailing the rest period without causing any important leaf modification, but some elongation of underground stems did occur.

Potato plants were sprayed to runoff four, two or one weeks before harvest with solutions of 0, 10, 50, 100 or 500 parts per million of gibberellin. The potatoes were harvested 111 days after planting. The tubers were cut and replanted three days later. The lowest concentration, applied one week before harvest, hastened emergence of sprouts, but emergence was most rapid by sprouts from those tubers from plants sprayed with the highest concentration four weeks before harvest.

No report of tests conducted with sweet potatoes treated with gibberellins was found.

CHAPTER III

MATERIALS, METHODS AND RESULTS

Roots of Porto Rico sweet potatoes were weighed individually. The roots were then placed in groups in such a way that the roots in any one group would be of a similar shape and about the same weight as the roots in any of the other groups. Each group contained an equal number of roots. The groups of roots for each treatment were then selected at random.

Potassium gibberellate[1] was made up to the selected concentrations in water which had been brought to room temperature. The various groups of roots were placed in the appropriate solution and allowed to remain for the desired length of time. The roots were then removed from the solutions and bedded.

The bed used was a greenhouse bench of concrete construction. The bottom of the bed sloped from the sides to the center. Holes in the center of the bench permitted drainage. The inside dimensions of the section of bench used were 48 inches by 32 inches. A wooden divider was constructed to separate fourteen rows of roots. There was space for four roots per row. The two outside rows were used as guard rows. Approximately two inches of sawdust was placed on the bottom of the bench. A lead heating cable was layed out on top of the sawdust, and another two inch layer of sawdust was placed on top of the cable. The bed was watered and heated to

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[1]Gibrel, furnished by Merck and Company, Incorporated, Rahway, New Jersey, was used in these trials.

a temperature of 85°F. The wooden divider was put in place and roots were bedded, end to end, not touching, in the rows. The roots were covered with two inches of moist sawdust. The thermostat was set to maintain a temperature of 85°F. in the bed. The bed was watered thoroughly about once a week. After each trial the sawdust was removed and discarded, and the bed was cleaned.

Time of soaking and concentration of potassium gibberellate were varied in the first trial. Four roots were subjected to each treatment. The roots were bedded December 20, 1957, removed and counts made January 20, 1958. Slips over four inches long were counted as slips produced at the first pulling. Results of this trial are shown in Table I.

All roots used in the second trial were soaked thirty minutes. For each concentration of potassium gibberellate six roots were soaked in a solution which contained a detergent,[2] and six roots were soaked in a solution to which no detergent was added. The roots were placed in the bed in a random design. There were three replications, two roots per replication, for each treatment. The roots were bedded January 29, 1958. Slips of a usable size were removed and counted February 26, 1958 and March 5, 1958. The roots were removed and slips of all sizes were counted March 17, 1958. The results of the second trial are shown in Table II.

Since the addition of the detergent to the solution, in which roots

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[2]Tide was used at a rate of five cubic centimeters per liter.

were soaked, appeared to reduce the decay of the roots, detergent was added to all solutions in the third and fourth trials. Boric acid, at the rate of one pound in five gallon of water was added, also, in a further effort to reduce decay of roots.

Only one concentration of potassium gibberellate and one soaking period was used in the third and fourth trials. Six replications of four roots each for each treatment were randomized across the bed.

For the third trial a concentration of one hundred parts per million and a soaking period of forty-five minutes was used. Roots were bedded March 22, 1958. The roots were removed and counts were made April 14, 1958. Slips over four inches long were listed as slips produced at the first pulling. The results of the third trial are shown in Table III.

Roots were bedded for the fourth trial April 17, 1958. A concentration of fifty parts per million and a soaking period of thirty minutes was used. Slips over four inches long were removed and counts made May 15, 1958 and May 23, 1958. Roots were removed and final counts of all slips were made June 2, 1958. The results of the fourth trial are presented in Table IV.

TABLE I

THE EFFECT OF POTASSIUM GIBBERELLATE AND LENGTH OF SOAKING PERIOD ON SLIP PRODUCTION AND THE NUMBER OF ROOTS ROTTING DURING THE FIRST TRIAL

Treatment			Mean Number Slips Per Roots Bedded	
Time of Soaking (Minutes)	Concentration (Parts Per Million of Potassium Gibberellate)	Roots Rotting (4 Possible)	First Pulling	Total
1		0	10.5	25.5
30	0	0	10.5	19.0
60		1	8.5	23.0
1		0	10.5	21.5
30	10	1	11.25	26.25
60		1	9.5	25.25
1		0	13.25	21.0
30	25	0	12.5	28.0
60		2	8.75	18.5
1		0	10	15.75
30	50	2	9.25	19.00
60		4	0	0
L.S.D. at .10		N.S.	5.78	N.S.

TABLE II

THE EFFECT OF POTASSIUM GIBBERELLATE AND A DETERGENT ON SLIP PRODUCTION AND THE NUMBER OF ROOTS ROTTING DURING THE SECOND TRIAL

Treatment			Mean Number Slips Per Roots Bedded	
Detergent	Concentration (Parts Per Million of Potassium Gibberellate)	Roots Rotting (6 Possible)	First Pulling	Total
-	0	0	8.66	31.33
+	0	0	11.66	28.83
-	25	4	3.5	10.33
+	25	2	5.33	17.83
-	50	3	5.0	16.17
+	50	2	3.17	22.66
-	100	5	0	3.17
+	100	3	2.83	18.17
L.S.D. @ .10			5.9	15.87

- No Detergent
+ Detergent Added

TABLE III

THE EFFECT OF POTASSIUM GIBBERELLATE ON SLIP PRODUCTION AND THE NUMBER OF ROOTS ROTTING DURING THE THIRD TRIAL

Parts Per Million of Potassium Gibberellate	Roots Rotting Per Replication (4 Possible)	Mean Number Slips Per Root Bedded	
		First Pulling	Total
0	1.17	7.42	34.88
100	3.83	0	2.54
L.S.D. at .005	1.17		
.001		5.86	15.4

TABLE IV

THE EFFECT OF POTASSIUM GIBBERELLATE ON SLIP PRODUCTION AND THE NUMBER OF ROOTS ROTTING DURING THE FOURTH TRIAL

(Parts Per Million of Potassium Gibberellate)	Mean Number Roots Rotting Per Rep. (4 Possible)	Mean Number Slips Per Root Bedded	
		First Pulling	Total
0	2.83	2.04	7.17
50	2.83	.79	6.75
L.S.D. at .25		1.1	N.S.

CHAPTER IV

DISCUSSION OF RESULTS

Data collected in these trials were treated statistically by the analysis of variance method. The figures showing the least number required for significance were calculated after the analysis of variance tests had shown that a difference did exist at the level of significance given in the tables.

Levels of significance as low as twenty-five per cent are discussed because the general trend for the differences was rather definite throughout the trials.

This preliminary investigation may give some suggestion of concentrations and soaking period which might be used in future studies.

Table I is a presentation of the data collected in the first trial. When the data were arranged as shown in Table I and subjected to the analysis of variance test, the only difference found was the reduction of slips at the sixty minute soaking period in the fifty parts per million solution of potassium gibberellate. This difference appears only when the number of slips produced at the first pulling are considered. However, when the data from the first trial were arranged as shown in Table V, VI, VII and VIII so that the effects of soaking period and concentration of potassium gibberellate could be tested separately, more differences were found.

Table V shows the number of slips produced at the first pulling. There appears to be a decrease in slip production, due to soaking period, at a ten per cent level of significance. At a twenty per cent level of

TABLE V

EFFECT OF TIME OF SOAKING AND CONCENTRATION OF POTASSIUM GIBBERELLATE ON THE NUMBER OF SLIPS PRODUCED AT THE FIRST PULLING DURING THE FIRST TRIAL

Treatment	Time of Soaking			
Concentration (Parts Per Million of Potassium Gibberellate	1 Min.	30 Min.	60 Min.	Mean
0	42*	42	34	39.33
10	42	45	38	41.67
25	53	50	35	46.00
50	40	37	0	25.67
Mean	44.25	43.50	26.75	

L.S.D. at .10 for soaking period is 11.15
L.S.D. at .20 for concentration is 9.77

*Four root samples

significance, slip production appears to have been reduced by the highest concentration of potassium gibberellate.

Analysis of the data in Table VI, which shows total slip production; indicates, at a twenty per cent level of significance, that slip production was reduced at the highest concentration of potassium gibberellate.

If data for the total number of slips produced at the one minute soaking period, presented in Table VII, are analyzed separately, there is indicated, at a ten per cent level of significance, that fewer slips were produced at the highest concentration of potassium gibberellate.

Table VIII shows the number of roots rotting from each treatment. There is a significant increase in the number of roots rotting at the longest soaking period. At a twenty per cent level of significance, there appears to be an increase in the number of roots rotting due to the highest concentration of potassium gibberellate.

The differences in slip production found during this first trial might be explained by the increased rotting of the roots, except for the total slips produced at the one minute soaking period. None of the roots soaked for only one minute rotted, but those roots soaked in a solution containing fifty parts per million of potassium gibberellate produced fewer slips than those roots soaked in water.

Since there were no outstanding symptoms of potassium gibberellate effects in the first trial, a detergent was used in the second trial in an attempt to cause increased absorption of potassium gibberellate by the roots.

Table IX shows the effects of the detergent and various concentrations

TABLE VI

EFFECTS OF TIME OF SOAKING AND CONCENTRATION OF POTASSIUM GIBBERELLATE ON THE TOTAL NUMBER OF SLIPS PRODUCED DURING THE FIRST TRIAL

Treatment	Time of Soaking			
Concentration (Parts Per Million of Potassium Gibberellate)	1 Min.	30 Min.	60 Min.	Mean
0	101*	76	92	89.67
10	86	105	101	97.33
25	84	112	74	90.00
50	63	76	0	46.33
Mean	83.5	92.25	66.75	
L.S.D. at .20				25.93

*Four root samples

TABLE VII

EFFECT OF CONCENTRATION OF POTASSIUM GIBBERELLATE ON THE TOTAL NUMBER OF SLIPS PRODUCED AT A ONE MINUTE SOAKING PERIOD DURING THE FIRST TRIAL

Treatment (Parts Per Million of Potassium Gibberellate)	Mean Total Number of Slips Per Root Bedded
0	25.25
10	21.50
25	21.00
50	15.75
L.S.D. at .10	5.76

TABLE VIII

EFFECTS OF CONCENTRATION OF POTASSIUM GIBBERELLATE AND LENGTH OF SOAKING PERIOD ON THE NUMBER OF ROOTS ROTTING DURING THE FIRST TRIAL

Concentration (Parts Per Million of Potassium Gibberellate)	Time of Soaking			
	1 Min.	30 Min.	60 Min.	Mean
0	0*	0	1	.33
10	0	1	1	.67
25	0	0	2	.67
50	0	2	4	2.00
Mean	0	.75	2	

L.S.D. at .05 for Soaking Period= 1.25
L.S.D. at .20 for Concentration= .89

*Four root samples

of potassium gibberellate on the number of roots rotting. Addition of the detergent seems, at a ten per cent level of significance, to have reduced the number of roots rotting. The number of roots rotting was significantly greater for all groups of roots treated with potassium gibberellate.

As shown in Table II, there appear to be more slips per root at the first pulling from the check with detergent added than from any group of roots treated with potassium gibberellate. There appear to be fewer total slips produced by those roots treated with twenty-five and one hundred parts per million of potassium gibberellate than from either of the groups of roots which were not treated with potassium gibberellate. The level of significance for these differences is ten per cent.

These data seem to suggest that there was a delay in slip production due to potassium gibberellate since fewer of the treatments differ from the check when total slip production is considered than when early slip production is considered.

The number of roots rotting would appear to account for the differences in slip production among treatments in the second trial also.

The third trial showed highly significant differences between treatments for number of roots rotting, slips at first pulling and total slips as shown in Table III. Although this trial showed the most definite differences found in this series of trials, these differences had been suggested in the first two trials. In this trial, as in the first two trials, the difference in slip production appears to be due to death of the roots.

Concentration of potassium gibberellate and length of soaking period were reduced, in the fourth trial, below the levels used in the third trial.

TABLE IX

EFFECTS OF CONCENTRATION OF POTASSIUM GIBBERELLATE AND THE ADDITION OF A DETERGENT ON THE NUMBER OF ROOTS ROTTING DURING THE SECOND TRIAL

Treatment	Detergent Added		
Concentration (Parts Per Million of Potassium Gibberellate)	No	Yes	Mean
0	0*	0	0
25	4	2	3
50	3	2	2.5
100	5	3	4
Mean	3	1.75	

L.S.D. at .10 for Detergent = .907
L.S.D. at .05 for Concentration = 1.6

*Six root samples.

As shown in Table IV, a decrease in slip production at the first pulling, at a twenty-five per cent level of significance, appeared in the fourth trial. This would seem to suggest that treatment with potassium gibberellate tended to delay sprout production.

The differences found in these trials were apparently due to death of the bedded roots. There seemed to be an increase in the number of bedded roots which rotted as concentration of potassium gibberellate or length of soaking period increased. It is not known whether the increased destruction of roots was due to an increased susceptibility of the roots to infection by decay organisms or to a stimulation of these organisms.

The data presented here would seem to indicate that a soaking period of thirty minutes or less and a concentration of less than fifty parts per million of potassium gibberellate could be used in future trials. Longer soaking periods and larger concentrations would appear, according to the data obtained in these trials, to have a deleterious effect on slip production, apparently due to decay of the sweet potato roots.

CHAPTER V

SUMMARY

Gibberellins have affected growth of many species of plants in various ways including the breaking of apical dominance in plants of some species. There would seem to be a possibility that the use of gibberellins could speed up slip production by sweet potato roots.

A series of trials was conducted to test some of the effects of potassium gibberellate on sweet potato slip production.

Concentrations of zero, ten, twenty-five, fifty and one hundred parts per million of potassium gibberellate, with and without a detergent added, were used. Roots were soaked in these solutions for one minute, thirty minutes, forty-five minutes or one hour prior to bedding.

No increase in slip production occurred due to these treatments. At the two higher concentrations and the two longer soaking periods slip production was decreased. The decrease was apparently due to the greater number of roots which rotted when subjected to these treatments.

The data collected in these trials do not eliminate the possibility that potassium gibberellate may be useful in hastening sweet potato slip production.

The data do seem to indicate that soaking roots longer than thirty minutes in solutions containing fifty parts per million or more of potassium gibberellate will have a deleterious effect on slip production, apparently due to decay of the roots.

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