Table I. Soil Fumigation For Chrysanthemums Spring 1957
Plant Responses of Three Chrysanthemums Varieties
Weight per Plant in Grams

		Portrait		Beauregard		Shasta	
No.	Treatment	root	stem	root	stem	root	stem
1	MC-2	11.66	23.0	13.48	21.3	3.76	10.4
2	Crag-Mylone	9.02	22.2	13.23	20.3	5.83	15.3
3	AA+Nemagon	4.35	14.8	13.84	18.5	1.55	5.6
4	AA+EDB	7.81	17.8	12.57	19.2	5.17	5.8
5	Vapam	13.22	24.5	25.75	24.0	2.81	10.0
6	Check	10.18	11.6	21.38	27.7	2.72	6.1

tions are the same as explained above. However, a polyethylene covering is necessary to keep the gas within the confines of the treated area. Methyl bromide penetrates the soil perhaps as deeply or more deeply than any of the other chemicals used. The gas is quite effective against all organisms.

Besides Vapam and Methyl bromide, Crag Mylone, Nemagon and allyl alcohol, EDB + allyl alcohol were compared with plants grown under non-sterilized soil conditions. Comparisons of yields for three varieties (Portrait, Beauregard and Shasta) in Table 1, indicate that nematode control was directly reflected in weight of stems and the production of healthy roots. Root weight of the various varieties was also indicative of variety response to the materials. Nematode counts taken two months after soil fumigation, Table 2, indicated that Methyl bromide, Crag Mylone, and Vapam were excellent nematocides.

Table II.

Relative Numbers of Ectoparasitic Nemadodes Extracted from Fumigated Soil

Treatments	Nematodes Recovered
Methyl Bromide	0
Crag Mylone	4
AA + Nemagon	94
AA + EDB	54
Vapam	4
Check	114

Steam

Steam sterilization is one of the oldest methods known for elimination of plant and animal organisms. The question was how to easily and economically treat large acreages with live steam. When there is a need or demand for something it will be dreamed up and built. A portable soil sterilizer has been designed and put into operation.

In summing up the control measures mentioned, each one has its advantages and its weak points. Until more extensive investigation has been made on various chemicals and the effects of cover crops, our advice is for the grower to select whichever of the three chemicals mentioned or steam if his operation is large enough to warrant such a machine. We have seen all of these methods used and have seen excellent results.

THE POSSIBLE USE OF GIBBERELLINS AS A SUBSTITUTE FOR ARTIFICIAL LIGHT IN GROWING CHRYSANTHEMUMS

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The gibberellins, substances produced by Gibberella fujikuroi, an organism that causes bakanae disease in rice, are capable of elongating cells of many plants. Two materials, gibberellic acid ($C_{19}H_{22}O_6$) and gibberellin A ($C_{22}H_{20}O_7$) of nearly identical action are involved. (1).

It was thought that the increased stem growth due to effect of the gibberellins upon cell length might be desirable in growing chrysanthemums (2). Because of short day length, chrysanthemums (chrysanthemum morifolium) will flower under Florida conditions while plants are quite short. Such plants have limited commercial possibilities since the trade requires a flower with a much longer stem. The grower obtains flowers of desired characteristics by providing extra light artificially to young plants. The extra light delays flowering until a much taller plant is produced. However, providing additional light is an expensive item from standpoint of investment of fixtures, automatic control and outlay for current and moving of shades. If the applications of the gibberellins could substitute for this expense, it would greatly simplify the growing of chrysanthemums.

To test the possible value of the gibberellins for this purpose, a pot experiment was established in the open at Hollywood, Fla. Seven inch clay pots were filled with muck and two rooted cuttings, variety Iceberg, approximately 5 inches tall were planted in each pot on Oct. 6, 1956. The cuttings took hold well and on Oct. 17th, the following treatments were applied as lanolin pastes (1).

(1) The gibberellic acid used here was supplied by Merck, Sharp and Dohme Research Laboratories and is a mixture of gibberellic acid and gibberellin A.

1. Check no treatment
2. 0.1% gibberellic acid
3. 0.5% gibberellic acid
4. 0.1% gibberellic acid
5. No gibberellic acid but additional light.

The additional light for #5 treatment was supplied by a 150 watt Westinghouse flood bulb placed six feet above the pots to be treated. Extra light of 3 hours daily was provided from Oct. 17 to Nov. 19.

All treatments were replicated 4 times and uniform fertilization at rate of 47 grams of 4-8-8 fertilizer was applied before planting. Additional side dressings of 0.4 gram per pot of a 16-16-16 soluble fertilizer containing secondaries was made each week by applying it with about 250 ml. of water.

Measurements of stem length were made on Nov. 15th and then again on Dec. 24. On the latter date, the plants in the first four treatments were in full bloom and these plants were harvested and weighed. Since extra light had delayed the flowering of plants in #5 treatment, harvest of this treatment was not made until Jan. 11, 1957. Measurements of length and weight are given in Table I.

The results show a marked increase due to application of lanolin pastes of gibberellic acid – the increase being proportional to the concentration. From observation, the increase

Table I

HEIGHT AND WEIGHT OF CHRYSANTHEMUMS AS AFFECTED BY GIBBERELLIC ACID AND LIGHT*

Treatment No.	Gibberellic acid	Extra light	Height Nov.15'56	Height Dec.24'56	Weight**
			cm	cm.	gms.
1	0	none	27.5	31.3	155
2	0.1%	none	29.0	33.3	167
3	0.5%	none	36.6	39.5	149
4	1.0%	none	40.0	41.0	155
5	0	Oct.17-Nov.19	39.0	45.2	401*

* Average of four replicates
** Treatments 1-4 harvested Dec. 24; #5 on Jan. 11,1957.

in height was very marked soon after pastes were applied but seemed to lessen with time. This is also borne out somewhat by the data. In all cases but one, there were greater differences in height between treatments on Nov. 15 as compared to Dec. 24.

On Nov. 15th the height of plants receiving the 1% concentration was actually greater than plants receiving extra light. However, by Dec. 24th, the plants receiving extra light had become appreciably taller than the tallest plants receiving gibberellic acid. In addition, the plants receiving extra light were more vigorous.

Gibberellic acid did not influence the weight of treated chrysanthemums to any marked extent. The increase in height of gibberellic acid treated plants was evidently at expense of thickness of stems and such plants did appear somewhat spindly.

Summary and Conclusions

From these preliminary results it is possible to conclude that gibberellic acid can markedly increase stem length of chrysanthemums. The effect of such treatment seems to lessen as time goes on. In this experiment, even the plants giving most response due to gibberellic acid were far inferior to plants receiving additional light. Therefore, it is not practical to substitute gibberellic acid treatments for use of artificial light with present knowledge. However, it might be worthwhile to determine whether gibberellic acid treatments can be combined with additional light to provide larger plants or to reduce the amount of light provided.

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1. Gibberellins—Data sheet, 1956 Merck, Sharp and Dohme Research Laboratories.
2. Mitchell, John W. Private communication.

SANSEVIERIA FOR ORNAMENTAL USE[1]

F. D. Wilson, C. C. Seale, J. B. Pate and J. Frank Joyner[2]

Certain species of *Sansevieria* Thunb. have long been grown for fiber and ornamental purposes. This genus, which contains more than sixty species (1, 3), is native to Africa and coastal areas of Arabia, India, and Ceylon (4).

Sansevieria fiber is produced commercially in the western hemisphere in the Yucatan peninsula of Mexico (8). In many parts of the world leaves from wild stands and dooryard plantings are collected by native people for the fiber to be used for making bowstrings, fish nets, baskets, coarse fabrics and other articles (4).

Some sansevierias are widely grown as indoor ornamentals in the United States. They are particularly important as ornamentals in south Florida because they can be used outdoors as well as indoors. At the present time, only a few standard types are grown extensively on a commercial basis. The potential for ornamental use is theoretically great, because little emphasis has been placed on breeding and selection, and on the utilization of the wide variation among species.

A research program for the improvement of sansevieria for fiber production has been carried out since 1943 by the Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture in cooperation with the University of Florida, Agricultural Experiment Stations. This work has been supported by defense agencies because of a possible future need for a domestic source of hard (cordage) fibers. Sansevieria is one of the few hard fibers adapted to large-scale mechanical production (6).

[1]/The research work on which this report is based was conducted cooperatively by the Crops Research Division and the Agricultural Engineering Research Division, ARS, U. S. Department of Agriculture and the University of Florida Agricultural Experiment Stations, Everglades Experiment Station.

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