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PRESIDENT SCANLON: I think we will proceed with the report of the activities of the Field Trials Committee. This report will be made by the chairman, Dr John Mahlstede, Department of Horticulture, Iowa State College, Ames, Iowa.

REPORT OF FIELD TRIALS COMMITTEE FOR 1956 — PHOTPERIOD STUDIES

JOHN P MAHLSTEDE
Chairman

During the meetings last year, as well as on the questionnaire circulated this spring by our program chairman, Mr. Louis Vanderbrook, considerable interest was expressed on the effect of light on plant growth, as it in turn is related to plant propagation. It was because of this interest that your Field Trials Committee, composed of Vincent Bailey, John Roller, Harvey Templeton, John Vermeulen and myself proposed the study as outlined by the NEWSLETTER solicited by Dr. Snyder on April 10th of this year. It was the primary objective of this study to determine what plant type could be maintained in a continuous state of growth by simply interrupting the normal dark period by two hours of light. In addition, by positioning the plants at varying distances away from a primary light source it was also hoped that some information could be obtained about the effect of light intensity on the growth of plants. It was not our intension to develop a program which, at the end of one year would see all propagation nurseries lit up like a Christmas tree between the hours of 12:30-2:30 A.M. every night during the growing season.

More important, this project was proposed to screen plant materials in an effort to see which would be responsive to light, and which would not respond With this lead, we could progressively carry on the program until such a point that it could conceivably fit into he propagation picture No one in the audience will doubt the importance of light to the floricultural industries, and especially to those growers producing a year around chrysanthemum crop.

At this point allow me to digress a moment. Yesterday we had quite a lively discussion about the timing of *Syringa* cuttings. Some propagators advocated the collection of cuttings prior to the date of full bloom, others suggested that laterals be collected two to three weekks after blooming, while Mr. Nordine stated that at Lisle, in tests this past year with many as 71 lots of cuttings, timing was of little consequence in the final analysis. Dr Chadwick has noted that they are working on the relationship between flowering, blossom bud differentiation, and rooting of softwood cuttings of lilac. Now, if by the proper manipulation of the light period we can prevent the differentation of blossom buds the previous season, the formation of the so-called rooting inhibitors associated with flowering may be prevented, thereby giving the propagator a vegetative stock plant that will produce no flowers, but will yield a number of cuttings with a high rooting potential over a relatively long period of time

The procedure which you received was checked before final printing by Dr Borthwick in order to insure that the procedure was correct and the general experiment of possible value. Since the instructions designated that any and all trial plants be placed in containers, the fact that it was necessary for the nurseryman to setup the facilities at a time when he was probably the busiest, and the prevalence of late spring freezes in the East, wet weather in the Lake states, and drought in the Midwest led to very little project participation. However, the data that was obtained from those who carried on the studies was most interesting. I would like to divide this presentation into two segments, ie., one which gives the results of this year's Field Trials Committee's activities, and the second which is devoted to the results obtained with five species of Viburnums by Dr. Downs and the staff at Beltsville.

PART I. 1956 FIELD TRIALS RESULTS

As I have already mentioned, the program as outlined was not highly patronized Mr. Art Buckley, Curator of the Dominion Arboretum at Ottawa, John Roller, Verhalen Nursery Company, Scottsville, Texas, and myself were the only three whom reported results The physical plant for this project consisted of a line of 200-watt reflector lamps spaced three feet apart in a line. Twenty or less plants were then to be placed in containers at right angles to this line of lights. A time clock hooked into the circuit was so set as to turn the lights on at 12·30 A.M. and off again at 2·30 A.M. The lights were to be maintained approximately three feet above the height of the tallest plant in any one segment. The number of height measurements was left to the descretion of the cooperator, although an initial height reading at the time of planting and one at the time the lights were turned off would be all that would be required to arrive at a growth increment Additional notes relative to branching habit, flowering etc. were also encouraged In order to compare the growth of plants under light as against normal expected growth, it was suggested that the cooperator plant an addditional five plants away from the main light planting.

Art Buckley handled the six plants which he tested in containers as outlined in the instructions John Roller also grew the ten plants he tested in containers. Our tests at Ames with 17 plants were handled by direct field planting of material furnished by Darrel Holmes and Ted Sjulin The data was summarized by 4 increments of 5 plants spaced along 25 foot of row. Light intensities were measured in the center of each of these four areas.

As would be expected from a study of this type, the results obtained were quite variable Lilacs, for example, both at Ottawa and at Ames, given light in the middle of the dark period generally made poorer growth, or at best were unaffected as compared to those plants not given the light treatment. *Prunus besseyi,* on the other hand under a high light intensity of 120 foot-candles made approximately one and one-half times the amount of growth that was made by plants not under light. However, at lower light intensities the results were not significantly different from the non-lighted plants The common Smoke Tree. regardless of light intensity or position in the row was stunted as compared to those not given light.

At Ottawa, *Kolkwitzia amabilis,* the Beautybush, under lights made a 329% increase in growth as compared to 233% increase over the original height for the non-lighted plants. At Ames, light intensities of 120, 30, and 2 foot-candles resulted in growth increase of from 5 to 9 times that of plants not under lights. In our trials, one of the most outstanding examples of the effect of lighting was observed on *Caryopteris* Blue Mist, which as you know is one of the few ornamentals which flowers in late summer or early fall Early in the growing period it was quite clear that plants directly under the light were going to be stunted and were generally less prone to spreading as compared to those at the lower light intensities. The final results are tabulated in table 1 which shows the stunting effect at a light intensity of 120 foot-candles and a general increase to 2 fc. More impressive was the spread of the plants, that is, one could almost draw two converging lines from the 2 fc exposure to the plants directly under the lights. The plants continued vegetative growth throughout the period of lighting as compared to normal flowering of plants without light. *Spiraea frobeli* was another plant which performed well at the lower light intensities, giving plants which had as much as 4 times the amount of growth under light as compared to the non-lighted plants

Table 1. Percent Growth Increase

PLANT	120*	30*	12*	2*	No Light
Caryopteris	50	176	154	193	171
	20**	25**	33**	39**	31**
Kolkwitzia	197	198	273	173	32
Spiraea frobeli	27	75	192	146	35

* Light intensity in foot-candles
** Final spread in inches

Two very significant effects of lighting were demonstrated by the results submitted by John Roller. The first one was noted on Crapemyrtle which at intermediate light intensities (120 foot-candles) set and produced blossoms approximately one month earlier than they would have ordinarily in containers. This was in direct contrast to those plants under higher light intensities (320 foot-candles) which were delayed in blooming (Table 2).

Table 2. Performance of Crapemyrtle as Influenced by an Interrupted Night Period

Approx Light Intensity	Plant No	Height of Plant and Flowering on May 2	June 5	July 7	August 5	September 5
320	1	6"	9	17	23½ few buds	26" 75% bloom
	2	6"	13	19	22 full buds	22
	3	6	11	16	19 bloom & buds	18 50% bloom
120	4	6	13	17½	19½ bloom & buds	19 25% bloom
	5	6	8	18 20% heavy	18 seeds	18
	6	6	9	15 bloom	17 buds	17
	7	6	13	21½ heavy bloom	22 seeds	21
50	8	6	11	14	16½ bloom & buds	16½

Another development reported by John Roller was observed during the course of the experiment with plants of *Forsythia intermedia spectabilis.* All plants located approximately 4-8 feet away from the light source in an area having light intensities from 120 fc to 50 fc died between July 7th and August 5th. These same plants were generally the ones which had earlier in the season put on the most growth.

Since the number of plants tested was relatively small it will be possible to record a number of intermediate responses which under normal circumstances would probably be omitted for the sake of brevity. The overall results of this study then can be summarized as follows: (1) Plants giving a general increase in growth at all light intensities over non-lighted plants — *Caragana arborescens, Euonymus nana, Kolkwitzia amabilis, Ligustrum lucidum compactum,* (2) high light intensities generally increase growth over low or no light — *Forsythia suspensa, Lonicera claveyi nana, Lonicera "purpurea," Prunus besseyi,* (3) plants stunted by high and low light intensities: normal or increased growth at intermediate intensities — *Elaeagnus angustifoldia, Fraxinus pennsylvanica, Philadelphus virginalis,* (4) medium and low light intensities generally increase growth over no light — *Spiraea frobeli, Weigela vaniceki,* (5) plants stunted by high light intensities; normal or increased growth at intermediate and low intensities — *Berberis thunbergi, Caryopteris* Blue Mist, (6) plants generally stunted by light period — *Abelia grandiflora, Cornus "nana," Choenomeles lagenaria, Cotinus coggygria, Ilex cornuta burfordi, Syringa 'President Grevy,'* (7) plants not responding to light period — *Deutzia lemoinei, Gardenia fortunei* (observed to be better branched under lights) *Rosa* (Red and White varieties), and *Syringa vulgaris varieties.*

PART II. RESPONSES OF SEVERAL VIBURNUM SPECIES TO DAYLENGTHS

R. J. Downs and A. A. Piringer, Jr.
U S Department of Agriculture
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During 1956 plants of five Viburnum species were grown on various daylengths to determine their effects on growth The growth measurements reported represent net increases during the treatment period in length of the shoots of main and lateral branches whether due to increased number of nodes, increased internode length, or both of these.

Uniform cuttings, rooted the previous summer and overwintered in the field, were provided by H. M Templeton[1]. The species were *V. burkwoodii, V. juddii, V. chenaultii,* and *V. plicatum forma tomentosum (V. tomentosum-plicatum)*. Three replicates of five plants each of the five species were subjected to photoperiods of 8, 12, 14 and 16 hours.

The study was begun March 5, 1956. Plants on all daylength treatments were maintained in the natural light of the greenhouse for a basic 8-hour period, from 8 a.m. to 4 p.m., after which they were moved into ventilated light-controlled chambers, where they received the necessary supplemental light to complete the given photoperiod. The source of the supplemental light was 100-watt incandescent-filament lamps, which proved approximately 30 foot-candles of illumination at plant level. The greenhouse experiments were terminated August 20, when final growth data were collected. Plants were maintained on their respec-

[1]Winchester, Tennessee