New York State Flower Growers

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REMOVING HYDRANGEA LEAVES AND HYDRANGEA FUNDAMENTALS

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Easter 1948 is March 28. A few fundamentals may help you to flower plants with little extra forcing. The information which is fundamental has been worked out over the past several years and when pieced together makes a complete picture of the pre-forcing and forcing treatment.

Factors influencing bud formation are (1) temperature, (2) light intensity, (3) foliage area and exposure to light, (4) vigor of the plants and (5) length of the vegetative shoot.

Bud development, after buds have once formed, is influenced by (1) storage temperature, (2) light intensity and (3) presence or absence of foliage.

Bud growth during the forcing period is influenced by the conditions under which plants formed and developed buds and (1) temperature, (2) moisture, (3) fertilizer and (4) light during the forcing period.

BUD FORMATION

Hydrangeas require a temperature below 65° for flower bud initiation. It is not

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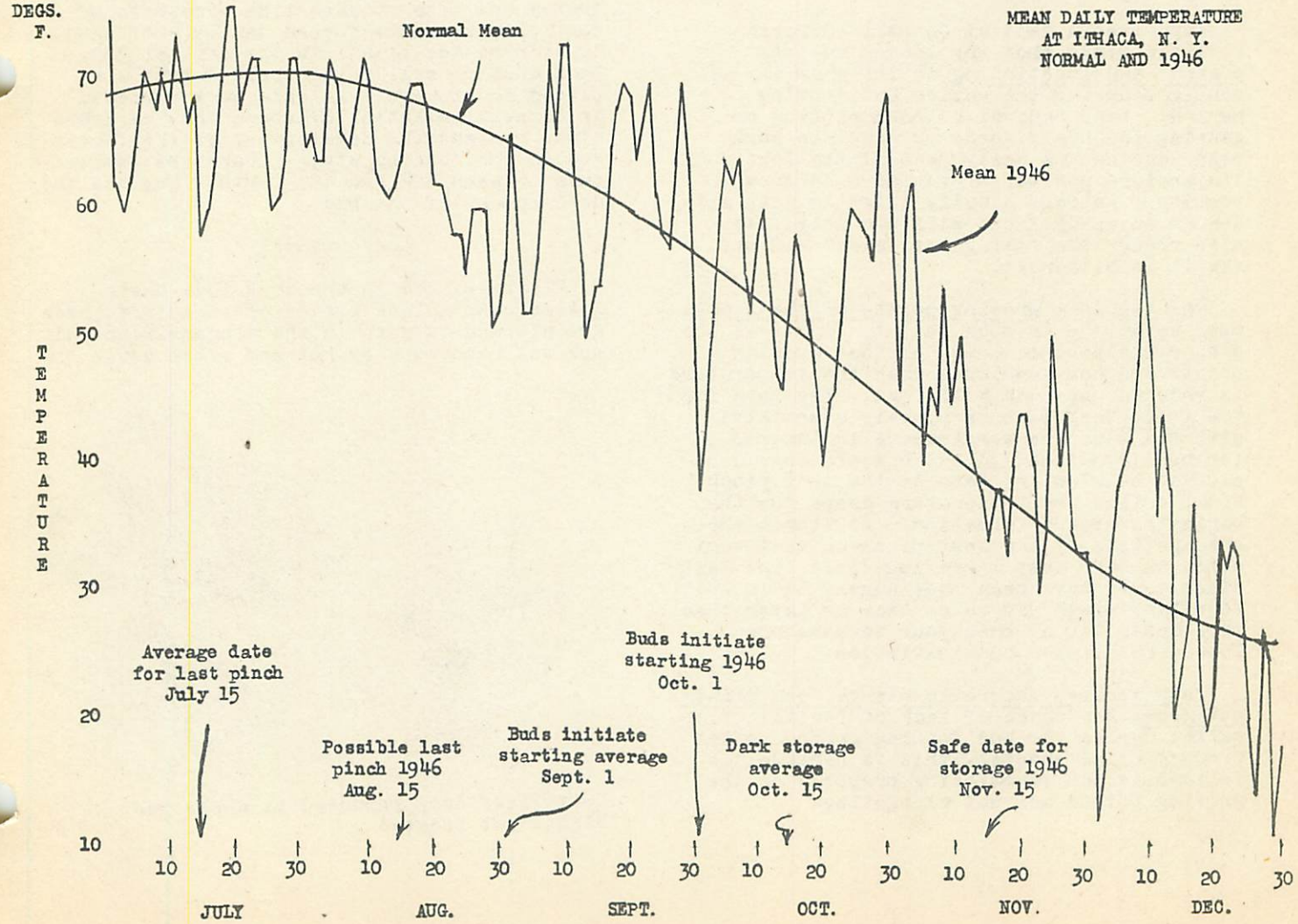


known if this is the night temperature only or if it is the average temperature but the evidence points to 65° as the average maximum temperature below which flower buds initiate. This indicates that bud formation starts when the night temperature is near 50°.

The exact date when the temperature is below 65° varies in different parts of the U.S. and it varies in the same locality from one year to the next. The accompanying chart for Ithaca shows the average temperature for several years and the actual average daily temperature in 1946. We have made the chart large so you can plot your local temperature on it.

We do not know what effect one or a few cool days, interrupted by one or a few warm days, has on bud formation. Probably the effect is similar to the interruption of the short day treatment of chrysanthemums. If the temperature is low more than half the time each week buds probably form.

About one month of low temperature appears necessary to complete the formation of hydrangea flower buds. Usually buds are well developed by October 15 at Ithaca. In 1946 they were not developed until November 15 because of high temperature. This probably varies with varieties and all other factors influencing growth.

Experiments made at Cornell (Cornell Bulletin #787) show the leaves must be present and functioning in the presence of sunlight during the entire bud forming period. Leaf removal by hand picking or gassing and heavy shade or complete darkness, during the early part of the low temperature period, prevented buds from forming. Foliage heavily infected with mildew or an early frost will probably likewise render the foliage valueless and may result in blindness.

The terminal growing points of the shoots must be active or buds fail to form. If the plants are pinched late, so that growing points are not developed when the temperature is reduced, no buds will form. The date for the last pinch is then closely associated with the time the temperature is lowered for bud formation. About 6 weeks should be allowed between the date of the last pinch and the time the temperature drops for the beginning of bud formation. At Ithaca the average date of the last pinch on most varieties is near July 15 to August 1. The last pinch could have been made August 15 in 1946. Your last pinch may be earlier or later than this depending on when your temperature lowers for flower bud initiation.

Thin shoots, chlorotic plants, and plants not growing because of lack of fertilizer or water, during the bud forming period, often produce blind shoots. This is because the foliage is not functioning properly or the growing points are not elongating.

Blindness

Blindness of hydrangeas like the blindness of chrysanthemums, the splitting of carnations and many other greenhouse troubles, has been attributed to everything which one does to the plant. With hydrangeas all of these factors may contribute indirectly to blindness.

To avoid blindness in hydrangeas make certain the plants have young actively growing tips and no mildew on the foliage when the average temperature lowers below 65°. Expose the plants to full sunlight, do not crowd them and make certain the foliage is not injured by frost or other means for at least four weeks at an average temperature near 60°. (Night temperature near 50°). At the end of this time flower buds, encased in leaves, are in evidence at the growing tips.

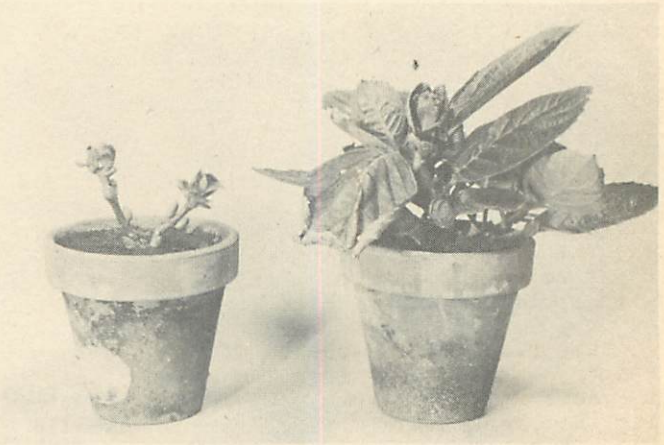
Blindness will result if these growing tips which hold the flower buds are injured or removed any time previous to forcing.

Dormancy Period

After the buds form in the fall they appear to become dormant. Certain changes are taking place during this time which permit the bud to grow when the temperature increases. The storage time necessary before plants can be forced can be shortened by storing the plants in the dark at 33°. Buds must be well formed before they are placed in storage. Allen's work reviewed in Cornell Bulletin 787 shows that darkness alone hastens the development of the flower bud to the forcing stage. Constant temperature between 32° and 40° further hastens the development of the bud.

Leaf Removal

Plants placed in the dark lose their leaves over a long period of time. If these are allowed to drop in the storage room and are not removed they rot and often cause the



Left, leaf drop produced by apple gas.
Right, not treated.

rotting of stems and buds. The falling leaves should be picked from the plants at least each week. This involves considerable labor.

During the past three years we have been experimenting with apple gas to remove the leaves. The treatment is the same as that developed for the removal of leaves from rose plants.

The hydrangeas are placed in an air tight storage room. One to two bushels of ripe apples are placed in the room for each 400 cubic feet of air space. The temperature is maintained at a minimum of 70°. A fan should be used to circulate the air in the room to permit uniform distribution of the gas. Four days in this closed case and the foliage usually drops when the plant is shaken. If the foliage has not loosened by this time the apples can be left a few days longer. If some leaves are dropping at the end of the fourth day the treatment can usually be discontinued and leaf fall will be complete in four to eight days.

The apples should be real ripe. Windfalls are preferred. We have had no injury to the buds of hydrangeas when one bushel of apples were used per 100 cubic feet of air space for four days. Some injury to the buds did result when plants were left with this concentration for ten days.

The apples give off ethylene gas which is responsible for the leaf drop. The pure ethylene gas could probably be used to accomplish the same result. Most storage sheds are not sufficiently tight to hold gas for a long time and the apples give a continuous low supply over a long period.

Last fall this treatment was carried out on several thousand plants in two storage sheds at the Dauernheim Corporation Greenhouses, Wantagh, L.I., N.Y. Mel Dauernheim used 75 bushels of MacIntosh windfalls in a 27,000 cubic foot storage shed. The apples were run into the shed on a truck and a fan used to circulate the air. Leaf fall was well underway after four days and the plants were completely cleaned of foliage in one operation. No buds were injured and the plants forced uniformly and easily.

Forcing

This year plants with well developed buds by October 15 will flower easily for Easter. Store the plants in the dark after buds are evident. Maintain a temperature of 32 to 40° or as cool as possible. Remove the leaves with apple gas if you like to save labor.

Take plants from storage after Christmas and grow them at 60° from the start. Keep the soil moist preferably by automatic watering (New York State Flower Growers Bulletin 23). Fertilize the plants to carry a uniform medium fertilizer level. Give them full sunlight.

Welcome New Members

ACTIVE

Cattaragus
Robert Westendorf, Peter Pan Flower Shop, Seneca Hts., Gowanda

Chemung
Merle T. Miller, Miller's Glad Gardens, 16 Cobbles East, Elmira

Tioga
John W. Whitmarsh, Evergreen Florist, Spencer

ASSOCIATE

California
Clarence M. Amling, Amling Bros., P.O. Box 357, Santa Ana

District of Columbia
James D. Paul, Paul's Wholesale Florist Co., 1414 Eye St., N.W., Washington

Missouri
H. R. Mueller, 16 S. Ninth St., Columbia

New York
E. S. Blauvelt, Ravena
George McCarthy, Long Island Fl. Supply, 39 W. Graham Ave., Hempstead, L.I.
Jerome J. Parker, 1187 E. 214 St., Bronx 67
David H. Walbolt, Shell Chemical Co., 1479 E. 26th St., Brooklyn 10
H. Weezenaar, Jr., Hudson Trading Co., Highland

Ohio
William N. Nye, 528 Second St., Marietta

England
Alfred Wheatcroft, Wheatcroft Bros., Ltd., Ruddington, Nottingham

Palestine
Rebecca Breizman, Meshek Poalot, P.O.B. 63, Petach - Tikva

Fossum at Purdue

M. Truman Fossum, Fellow of the New York State Flower Growers, left Cornell September 15 to continue his studies in agricultural economics at Purdue University, Lafayette, Indiana. We are looking forward to his return to Cornell in 1948 to continue his research and direct the research in the economics of florists crops.

During the past month two fellowships were granted Cornell University by the Society of American Florists for additional work in the field of economics of floriculture. These fellows will work under the direction of Professor Fossum in compiling statistics about the florist business from a national standpoint. The New York State Nurserymen's Association is supplying funds for travel and maintenance for one assistant to obtain statistics of the nursery business in New York State.

THE SOUTH AND WEST

A sabbatic is a rare opportunity for professional improvement. Travel is always enlightening and during the last six months your editor visited some of the high spots in the South and West.

Optimism and enthusiasm for expansion in all phases of production reigns supreme in the minds of growers. Improved efficiency, mechanization and the application of science to production methods are giving more economical production. Greater specialization in production and selecting a location best suited to the production of the specific crop are definitely the trend.

Air transportation to and from all parts of the world is causing some concern. This along with the possibilities of creating a larger flower buying public is stimulating interest in expansion.

Much of the expansion in cut flower production is in field grown material. Field growing is most popular in the southern part of the U.S. because weather conditions permit production for the winter market.

It is evident that few of the new operators know the factors influencing the growth and flowering of the plants they are dealing with. Because of lack of such information the development of the industry is by the costly trial and error method.

Most operations are of a large scale gambling type. Many of the new operators are headed for failure before they plant the first crop. Weather conditions in the South are hazards to winter production. If everything is favorable the crop is very good but if low temperature, rains or some favorable conditions for disease arise the grower is nearly helpless to save his crop. One can readily see these factors are going to produce quantities of material at times and shortages when conditions are less favorable. We can probably expect greater peaks and greater valleys in the price curve than we have previously seen because of a greater influence of weather conditions on the production than results when the production is under glass.

The 1946-47 gladiolus production in Florida is a striking example of weather effects. Plantings made for February cuttings flowered in 60 days rather than the planned 90 days and were cut at the same time as flowers planned for earlier bloom. This gave heavy production of low quality at the first of the year. Later cool weather delayed growth giving a period of poor production and good prices.

Striking examples of disease ruining the crop are always evident. Plantings of pompons in the field last year were ruined with foliar nematode in Florida and with rust in California. The flower break, caused by a virus, on stocks in Southern California last winter completely ruined some plantings and caused serious losses in others.

Lack of knowledge about fundamentals of the production of a given crop is evident where growers have attempted to grow chrysanthemums in Florida. The daylength there is quite different from that in more northern latitudes. Buds evidently form over a long period of time but they develop very slowly or not at all. This gives hard stems which apparently do not take up water after they are cut. It likewise produces a much branched and uneven flowered spray. There is no fundamental reason why chrysanthemums cannot be produced every day in the year in every part of the world if daylength and temperature are accurately controlled.

Stocks in California are planted during the fall and early winter. If the temperature is high at the beginning of the growing period long stems develop before buds form. Later plantings, which are affected by low temperature early, form buds and flower on short stems. Last spring fields of stocks were not cut because they were too short.

High quality cut flowers are, however, being produced in the field when all factors are controlled. Expansion will doubtless occur in the production of gladiolus and chyrsanthemums in Florida, and chrysanthemums in Texas and California. Carnation production out of doors near Los Angeles is most likely to expand rapidly and so long as flower prices in general remain high we can expect a continued increase in the field of production of miscellaneous flowers in all parts of the U.S.

Probably orchid production is expanding most rapidly of all production under glass. Plant prices are extremely high and the business appears to be running the course of the tulip mania in the seventeenth century, the gladiolus after 1920 and the Northwest lily in 1940. This is especially true with cymbidiums in California. Amateurs can grow them under lath and commercial operators in southern California are producing them by the acre. The ease of shipping and fair quality produced by this method will doubtless be felt in eastern markets.

The South and West is truly a land of opportunity for flower growing. Much effort and money will be lost by those improperly informed about environmental conditions and plant reactions to these conditions. In most areas their best markets are local. The past and present population shift makes these markets increasingly attractive.

Your editor,

Kenneth Post