Colorado Flower Growers Association, Inc.

IN COOPERATION WITH COLORADO STATE UNIVERSITY
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A BRIEF REPORT ON RESEARCH AT BELTSVILLE

by W. D. Holley

While attending a recent meeting of the Research and Development Committee of the Society of American Florists it was my privilege to become acquainted with the Horticultural Crops Research Advisory Committee. This is a group of 19 outstanding horticulturists from throughout the country who advise on Department of Agriculture programs concerning horticulture. We do not have a florist on this council, but we are promised one at an early date. We hope this member will be Floyd Bachman of Minneapolis. After meeting with this Advisory Committee one day, we visited the Crops Research Station at Beltsville with the group the following day. A report of some of the research that we were shown and told about follows.

Entomology Research

In the entomology section are some of the most far-reaching projects yet conceived on control of insect pests. Most of this work was conceived and begun long before the advent of "Silent Spring." The research that catches my eye and ear mostly deals with methods of biological control of insects. The use of chemosterilants has already borne some fruit in improved control of isolated insect populations. Briefly, this involves rearing male insects in large numbers and sterilizing them with chemicals, and releasing them in an area where they mate with normal females who lay unfertilized eggs. This method of control must be carried out for several years in order to reduce the population to the point where natural enemies will eliminate the last of it. It is also a method of control that must be used over large areas, hence, cannot be done by individual farmers or isolated persons. Work on flies has been outstandingly successful in isolated areas, and some positive results have been obtained on boll weevils. Radiation sterilization is also being tried, but is considerably more complicated and does not give the promise, at least in the opinion of the researchers, that chemosterilants do.

Part of the research is to screen many chemical compounds for their sterilizing effects and determine the dosages required to do the job without killing the insects. From the chemical structure of many compounds, possibilities for chemosterilants can be determined.

Another outstanding means of biological control being explored is the use of disease organisms, viruses, and even toxins from certain bacteria for killing insect populations. Insects have virus and other diseases which can be turned against them. This is being done at Beltsville with diseases of cabbage looper and several other insects. One bacterium has been found that produces at least 20 toxins, many of which are toxic to insects. The toxins can be produced eventually by pharmaceuti-

cal companies much as they presently produce antibiotics. These toxins would not be harmful to humans, but could be sprayed on, or introduced to, the insects as a means of controlling them.

An exciting sidelight to this work is the discovery by one of the researchers that the larvae of flies are quite sensitive to carcinogenic compounds. Should this work out, the screening of carcinogens could be much more effective, and could be done much more cheaply than with the present methods of using white rats or other animals. Tumors form in the larvae quickly from some cancer-causing compounds, and it is hoped that this will be true for all such compounds.

Storage and Marketing Work

While the storage work is done by the Agricultural Marketing Service, it is under the Horticultural Crops Branch and in close cooperation with the horticulturists at Beltsville. For many years, the Agricultural Marketing Service has been doing research on controlled-atmosphere storage of fruits. More recently, they have worked with some vegetables and are beginning to work now with flowers. Their work also includes the atmosphere in the package during transit and the type of package and liner used in packages. The work also deals with many other facets of storage, handling, and marketing.

We were shown two outstanding demonstrations from their present work. Apples and tomatoes that had been stored in high nitrogen-low oxygen atmospheres were compared with others stored in high nitrogen-high carbon dioxide and low oxygen. Their present work raises the question that possibly carbon dioxide is not needed at all in storing some products, and that respiration and development can be arrested by merely dropping the oxygen content to one or two percent. The remainder of the atmosphere in this case would be nitrogen. Carbon dioxide may be essential to the development of anthocyanin pigments should these pigments need to develop during storage; otherwise, the carbon dioxide might be eliminated.

The second demonstration was the sorting of potatoes by means of light beams. As the potatoes moved around a conveyor, a beam of light at each station shining through the middle of the potato detected any dark spots inside the potato and automatically ejected them, unless the potatoes were sound and white all through. This same light principle can be used on quite a few sorting processes, especially if the defect is on the inside and cannot be seen on the surface. Electronic sorting for some jobs is practical.

Plant Physiological and Floricultural Research

Work being done by Drs. Borthwick, Stuart, Cathey, and Hendricks, as well as others, on day length control, phytochrome, and growth-influencing chemicals is certainly one of the most outstanding research programs on plants in the world. Dr. Borthwick gave a very understandable demonstration and explanation of how phytochrome works in plants, and what it is. He said it is the receptive pigment for certain bands of red light that let a plant or animal, for that matter, know what time of the year it is by the length of daylight and darkness periods. This same pigment controls such widely different functions of plants as vegetative growth, flowering, branching habits, and even seed germination.

Drs. Cathey and Stuart are bringing out many of the practical applications of pioneering work done by Borthwick, Hendricks, Parker, and others. They are combining the effects of day length, chemical growth control, and temperature to completely control many plants. Their hopes are to be able to write recipes for each plant that can be controlled by these factors. They have done outstanding work on azaleas and rhododendrons during the past several years. They are now turning some of their efforts to the control of garden annuals. Noted in their greenhouses are beautiful Gold Coin Marigolds in pans, grown very much like pot mums, in flower about seven weeks from the seed flats. These were stocky plants, and did not need staking. They have worked out the influences of these factors on petunias and know how to produce a petunia of any shape, size, or height. Chrysanthemums have been studied from this same angle, and much of the recent work and information on chrysanthemums come from their research.

Breeding Work

Six and two-tenths of the staff on the flower and ornamental plant culture research is devoted to various projects under the heading of breeding. Basic breeding work to develop parent stock for commercial breeders and to discover certain genetic principles is being done on a great many plants including African violet, azalea, camelia, carnation, hardy chrysanthemum, crepe myrtle, day lilies, lilies, poinsettia, roses, and several woody plants. Most of this work is very slow to mature, and when a long-term program is well established, it is costly to discontinue it, as much of the work may be lost.

Plant Diseases

This field of ornamental plant research involves 2-7/10 men with the work concentrated on Easter lilies, geranium, gladiolus, and the transmission of viruses in several plants.

Summary

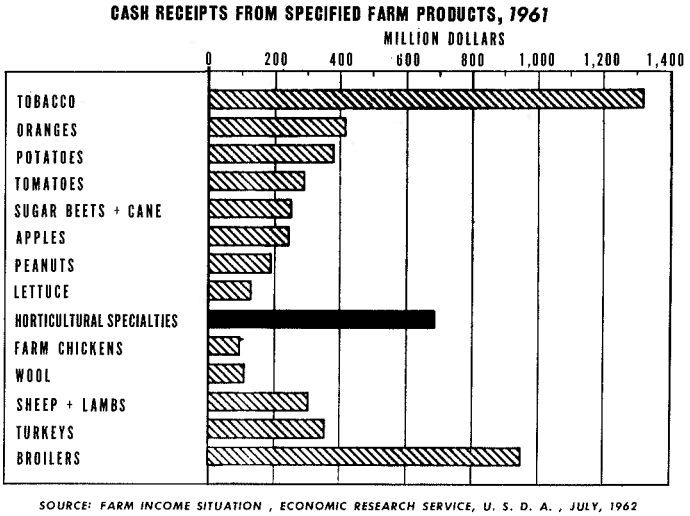
The technical problems arising from the culture of hundreds of kinds of ornamental plants are certainly legion. The number of untouched problems in our industry is great. We need men with foresight to attack these problems even before they are recognized by many of the commercial growers. This past year the Federal stations have had a total of 16.3 professional men working on flower and ornamental plant research. Their accomplishments have been much greater than most people realize, and this is especially true when one learns of the financial handicaps under which they work.

The Ornamental Plants Section at Beltsville and its branches in other sections of the country have not received their share of plant research money over the past several years. With costs of overhead and salaries automatically rising each year, the Ornamental Plants Section, by receiving the same amount for several years, has experienced an attrition rate of about five percent per year. As an example, the Beltsville research team has to pay $100,000 of their appropriation for space in greenhouses and offices, and this increased from the previous year by $17,500. One can quickly see that with this type of increase and a stable amount in the budget, the program must go downhill. Periodically, Congress passes salary adjustments, but does not increase the budget to take care of this. This means that the operational budget suffers to pay higher salaries, and again the program is hurt.

Each year for the last several years, the Research and Development Committee of the Society of American Florists has tried to help the Beltsville team to get an increase in their budget. John Walker, executive director of the Society of American Florists, has done yeoman duty in appearing before Congress and in trying to help increase this budget. Each year the amount asked for is sidetracked somewhere along the line, and at present we feel this is happening before the request gets to Congress. We must have more money for the ornamental plants research at Beltsville, primarily for floriculture, and we need to go to the right places to get it. These right places appear to be through members of the Congress that are interested in our program, and who come from and represent sections of the country important in floriculture. Help is needed from the entire industry to restore the appropriation for floriculture research where it should be. Key members of the industry will be called upon for this assistance.

Flower Growing is Important

Horticultural specialties had a farm value of about 700 million dollars in 1961. Horticultural specialties are made up of nursery crops, flower seeds and bulbs, and floriculture. Floriculture makes up about half of the total. Note from the chart that horticultural specialties exceed all but tobacco and broilers of this group of commodities. If we compare floriculture only, it exceeded all but three of the commodities and was approximately equal to the farm value of potatoes or turkeys. It is amazing how much money is appropriated for research on some of the products in this chart, both at state and national levels, and how little is made available for floriculture.



SOURCE: FARM INCOME SITUATION, ECONOMIC RESEARCH SERVICE, U. S. D. A., JULY, 1962

Rose Grading Survey

In a recent survey of the opinions of retail florists on current rose grading done by growers, Professors Coorts and Culbert in the Univ. of Illinois report the following in Ill. State Florists Ass'n. Bull. No. 237.

Nearly half of the respondents (120 total) to the survey questionnaire favored roses graded at 3-inch intervals of stem length.

Greatest preference was for stem lengths in the 18- and 24-inch range. This size was used mainly in flower arrangements and baskets.

Freshness was considered by retailers as the most important characteristic to be considered in rose grading, followed by bud size.

The presently used bunch size of 25 roses was satisfactory to 86 percent of the responding Illinois retailers.

Considerable dissatisfaction was expressed concerning methods now used in grading roses.

A major criticism of grading as now practiced is the inclusion of one or more inferior flowers in a bunch. Their comments are listed below in the order of frequency:

1. Including one or more flowers in the bunch that are off-size, off-color, bullheaded, or showing other defects.

2. Placing weak-stemmed flowers in with strong, straight-stemmed stock.

3. Cutting stems with stubs of hard wood, resulting in "hooks" that interfere with water uptake and result in crooked stems which the retailer has to cut off before use.

4. Allowing considerable variation in stem length in the bunch.

5. Including flowers with foliage badly damaged by insects or disease.

6. Cutting flowers too tight.

7. Mixing either a few wide open or immature flowers in the bunch.

Your editor,

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