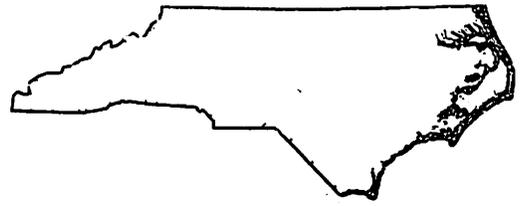


North Carolina

Flower



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FLOWER PRODUCTION IN BOGOTA

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This past March I had the opportunity to visit with the floral industry in the Bogota area of Colombia. Never having been there before, those nine days dispelled many misconceptions and provided several fertile areas for thought. These points I wish to share now.

The floral industry in the Bogota area is composed of a little more than 50 growers with a combined area of over 500 acres of polyethylene greenhouses. Most of the greenhouse area is used for carnation production (Fig. 1, 2). A modest number of chrysanthemums are grown (Fig. 3). Minor crops include roses, marguerite daisies, and alstroemeria.

The greenhouses are of a tropical design with the sides and ends generally open (Fig. 4). The roof is usually a saw-tooth design with the top portion of one slope permanently open for ventilation (Fig. 5). Evenings can sometimes be cooler than desired with temperatures dropping to an extreme low of 30°F. As a result, newer construction includes polyethylene sides which can be manually raised and lowered. Solar energy trapped during the day is sufficient to preclude any injury at night.

Temperatures are reasonably constant throughout the year with only a three degree variation in average monthly temperatures from January to July. The average minimum night temperature is 50°F and the average maximum day temperature is 66°F. The temperature rarely exceeds 75°F. Such temperatures eliminate the need for heating and automatic cooling and are ideal for carnation culture. These conditions exist in spite of the fact that Bogota is located only about four degrees latitude north of the equator, because of its situation high in the Andes Mountains at 8,660 feet. The close proximity to the equator explains the nearly constant 12 hour daylength year-round. The high altitude coupled with such daylengths eliminates low light intensity as a limiting factor to growth as it commonly is in much of the United States during the winter.

The city of Bogota, with a population better than two million, is located on a savannah which I would estimate to be 40 miles wide and 80 miles long. This flat grassland plain was once a lake rimmed on all sides by mountains. It has since drained and is now an area of very deep soils, three to six feet.

The soils are rich with organic matter contents of 20 and 30 percent. Obviously they hold nutrients well. The soils, however, are acid ranging generally from pH 4.5 to 5.5 and thus require heavy additions of limestone. Acidity is due in great part to the highly weathered clays and their very high aluminum content. This is a similar situation to North Carolina soils, and as in this state, aluminum toxicity can ensue if the soil pH is not raised to a level above 5.5.

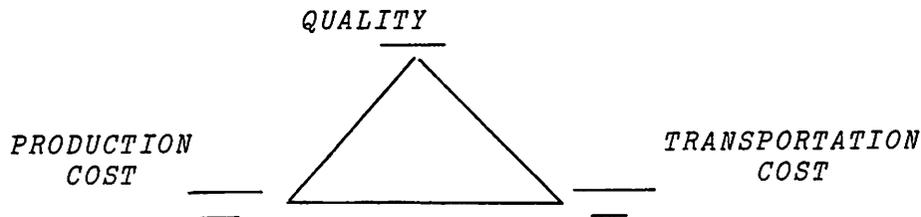
A major problem in the Bogota soils is the tie-up of phosphorus by aluminum. This is combated by exceptionally heavy applications of superphosphate and by raising the pH level to reduce the level of active aluminum.

These soils are moderately well drained but for greenhouse crop purposes the texture generally needs to be made coarser. Sand is commonly used and in a moderate number of cases the ash from coke, burned in the process of smelting iron ore, is used.

Our industry knows of the Bogota savannah growers from the standpoint of competition. Many misconceptions are shared concerning the quality of their production, the reasons for their existence in that part of the world, and their future stability. We have seen similar floral concentrations develop within our own country since the middle part of this century. Field grown chrysanthemums in Florida and California were great cause for concern in more northern greenhouses during the 1950's. This shift was fostered by lower production costs in these sub-tropical areas where greenhouse structures and heating fuel were unnecessary and labor was cheap.

A short while later, the vast carnation industry in New England, New York, Pennsylvania, and around Chicago found itself adjusting to sudden, heavy competition from the Denver, Colorado area and later still, from California. The high altitude, and consequently light intensity, in the Denver area permitted a higher quality product. Also, during this period of time air freight rates were reduced by almost 50 percent on east-bound traffic to encourage shipment in that direction. A westbound reduction was not made.

The point to be realized is that floral production will naturally gravitate to the region where the best compromise exists for the three factors, level of quality demanded by the market, low production costs, and low transportation cost.



Contrary to many claims, high quality flowers can be produced in the Bogota area throughout much of the year. Transportation costs can be lower from Bogota to our east coast than from California. Production costs are also generally lower with some claims made for a 4¢ per carnation bloom cost of production. The three factors in the above production determinant triangle are quite well optimized in the Bogota area. This explains the fact that floral production continues to exist and expand there.

There is more to floral production than a proper climatological and economic environment. The human factor of management is equally important. Apparent among the owners of the Colombian floral firms is a wide range of successes in many diverse professions and businesses including law, politics, foreign ministry, etc. Their training has been derived from universities throughout Europe, the United States and many other countries.

While it is obvious that there is strong financial support behind many of the floral firms the principle reason for success is due to other factors. Most of these firms are managed very soundly. The structures provide large centralized areas of production for ease of movement. The average firm being large, is able to establish efficient grading and packing lines (Fig. 6). It should be noted, however, that most firms handle their sales independently rather than in a cooperative effort; a point worthy of question. Occasionally I noticed schedule charts hanging in the management offices, such as that pictured in Fig. 7, which showed daily cultural activities six months or more in advance. A performance chart was noticed hanging in the production area of one firm for all workers to see. It indicated the number of blooms harvested, the grade, and the amount of loss due to human error. Such a chart gives a sense of pride for work well done and encouragement for change where needed.

Clearly defined managerial structure is quite apparent when one visits these firms. All levels of management from the general manager to the production manager and his or her assistants are afforded an opportunity to meet with technical visitors. Judging from the volume and depth of questions asked, each manager is delegated authority and is concisely aware of his or her responsibilities; two very important ingredients in successful management. The industry as a whole appears to be long on managerial skills but short on technical knowledge. This short coming is recognized and very positive steps are taken to correct it.

Flexibility was another interesting attribute noticed. Testing of propagation methods (Fig. 8) and of new crops (Fig. 9) were but two items seen. In general there is a willingness to try new ideas and change where warranted.

In summary, I feel that the floral industry of Bogota was established on solid principles and cannot be expected to fade away. Undoubtedly more competition will come in the future from Bogota and other areas. Our only promising recourse is to meet such competition through quality products, continuous availability, and increased efficiency of management, production and marketing. In this respect the following four suggestions are offered.

- 1) Focus more strongly on sound management practices including establishment of marketing and production goals, proper arrangement of greenhouses, working areas and tool storage, appropriate delegation of authority, concise assignments of responsibility, and establishment of a positive physical and emotional environment for productivity.
- 2) Seek technical information from universities, grower organizations, and the companies providing products and services for the floral producing industry. Be a member and participate in your local and national grower organizations.
- 3) Test new products and concepts of production, marketing and management. Keep an open mind so that there is room for change.
- 4) Be informed as to the situation of our national industry and the international industry so that you are better able to prosper rather than be injured by changes.

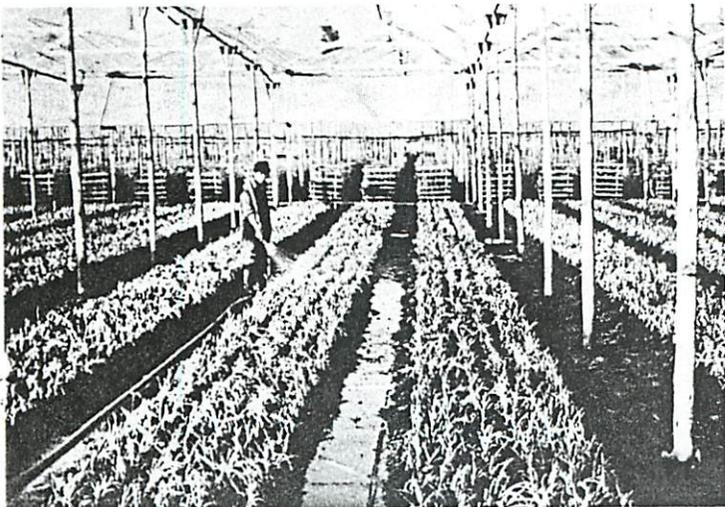


Figure 1. A newly painted crop of carnations in a recently constructed greenhouse.

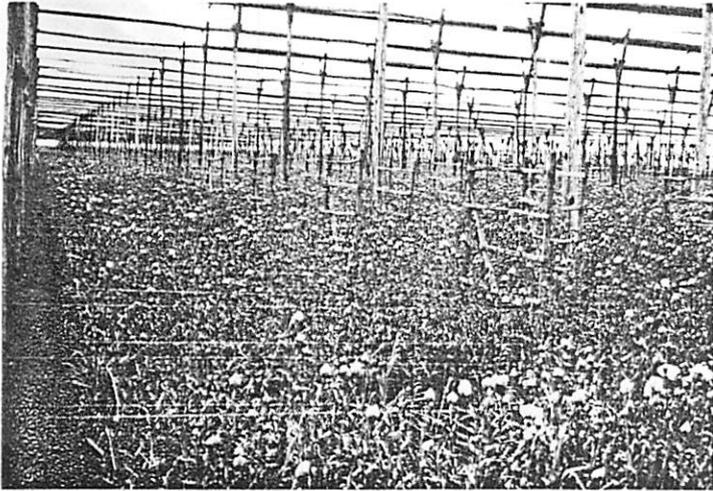


Figure 2. An established crop of carnations. The extensiveness of this and the consolidation of greenhouse space into a single growing area is typical of most growers.

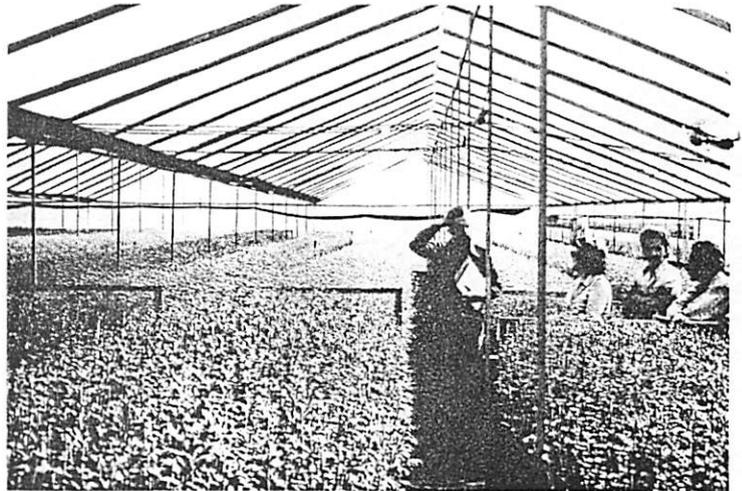


Figure 3. A uniform, high quality crop of chrysanthemums grown in a ridge-and-furrow polyethylene greenhouse range.

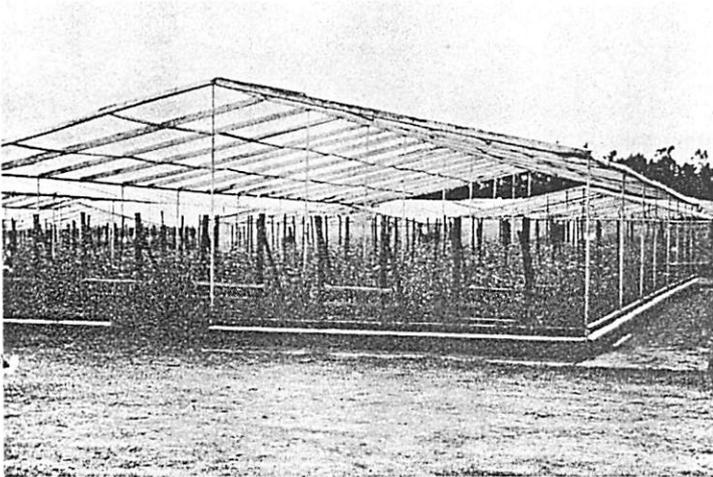


Figure 4. A greenhouse design with permanently open sides and ends.

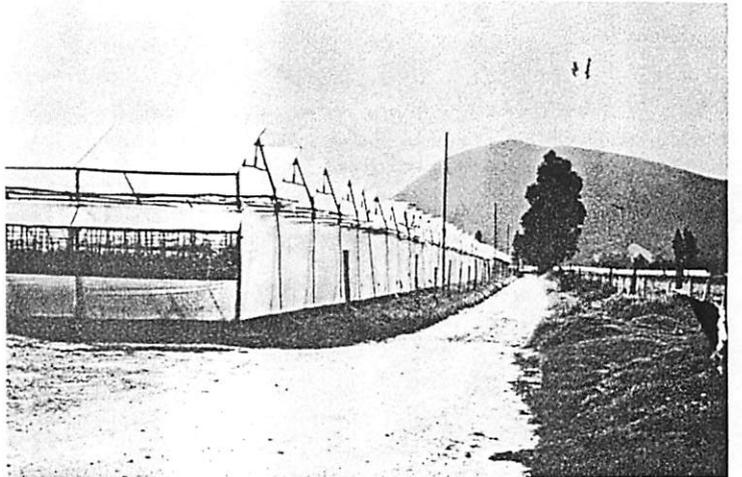


Figure 5. A ridge-and-furrow greenhouse range. The gable of each house is open on one side for ventilation. The side walls can be closed by raising the lower polyethylene sheet.

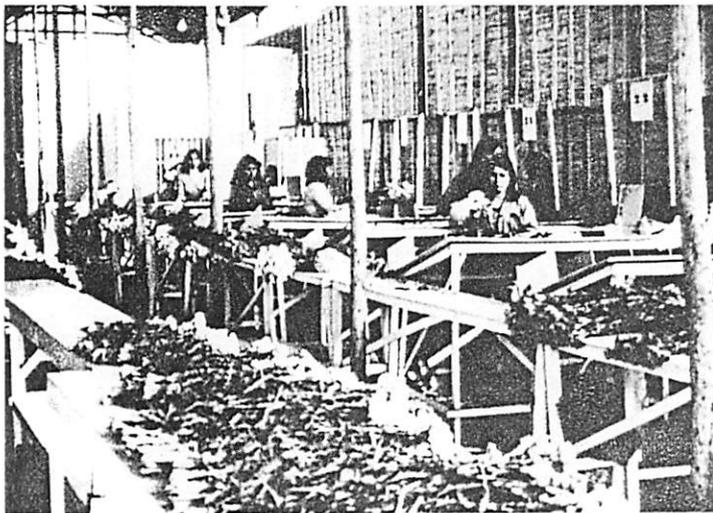


Figure 6. A grading and packing line for carnations.

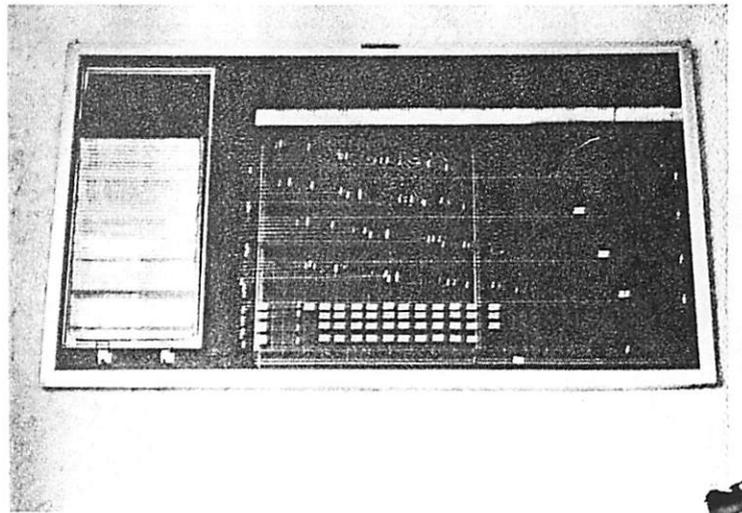


Figure 7. A carnation production chart. Horizontal lines represent crops. Numbered pegs are inserted in holes corresponding to the dates when cultural operations are required for the crop. Pages on the left describe the various operations.