Edited by Joe J. Hanan

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COLUMBIA: MORE THAN A DECADE LATER

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A one week trip to Columbia was an eye opener. Approximately 15 years after starting production in Columbia, the industry continues highly profitable, and continues to seek new and better ways of making money. The climate and social conditions in the country provide outstanding assets in ornamental production, but also some liabilities.

Six commercial ranges were visited during a one week period August 1985, in the savanna area around Bogota and at the lower elevation of Medillin, northwest of Bogota. For one who is used to much smaller operations, the size of some of these establishments was rather awesome — the smallest running to about 15 acres, the largest to over 170 acres. Undoubtedly, there are smaller operations, and a few hours at each of those visited does not provide one with the chance to do a good "walk-through". Carnations, roses and chrysanthemums were the main crops with some alstroemeria and gerbera. Other crops were being examined.

Soil conditions in the region are completely different from the semi-arid, alkaline, heavy types found in Colorado **(Fig. 1).** In the savanna, the soil is highly organic, very porous and acidic. Considerable phosphate and lime must be applied. The temperature conditions are highly suitable for carnation production, with chances of frost during the year in the savanna (8600 foot elevation). This is really too cold for roses **(Fig. 1),** but provides a very heavy, long stem rose, which, with the soil, has very little chlorosis. The greenhouses are usually completely open, single layer polyethylene, with no heating **(Figures 2-4).** Some of the newer structures are very light and high. Older, "pole" structures are gradually being replaced as they rot out. Being within a few degrees latitude of the equator, the photoperiod throughout the year is relatively constant, the climate being characterized by two rainy periods, one in our spring, another in our fall. Frosts in the savanna can cause problems with the crops.

One thing that impressed me was the general youthful aspect of the "middle" management **(Fig. 5).** Many of the managers, or growers, were not too far out of their training at the agricultural universities, with a number having received advanced education in U.S. schools, Israel and Europe. They seem enthusiastic in their approach to their jobs.

Considerable money is being spent by a number of the larger operations to provide themselves with clean stock **(Figures 4, 6-8).** One sees high effort to control diseases **(Figures 7, 8),** and there is marked interest in disease resistant material **(Fig. 9).** Through the central association (ASCOFLORES), moves are being made to bring the research organization into active participation with the industry — one thing that has been lacking in most South American and European institutions. With us for an example, we cannot expect them to continue to rely on outside information and assistance. They will shortly be doing their own research for their location.

In general, I was given the impression that ornamental production in Columbia has been quite lucrative over the previous years. This may change in the future, but most of the establishments have made significant investments which they will wish to protect. We can expect continued, stiff competition, and not just from Columbia.

The situation in Columbia emphasized the means by which the U.S. can compete effectively with them. When labor is less than $5.00 per day, it makes our cheap labor highly expensive by comparison — and we may not be able to continue that utilization in the future. This labor market, which the local governments like to see, combined with extremely inexpensive structures and insignificant energy requirements, means that we must do as the Dutch are doing — compete on the basis of higher yields per unit area, better quality, and getting that quality to the consumer. At least we have that going for us, we are closer to our markets. Any technology which reduces energy consumption and labor costs, while maintaining higher productivity is devoutly to be hoped for.

Systems which tend to reduce the twin components of yield and quality are likely to be the most expensive in the long run — such as poor water quality, improper fertilizers, failure to control environment adequately, etc. We have seen considerable mechanization in some parts of the industry in the U.S., and strong emphasis on this aspect with cut flowers is needed.

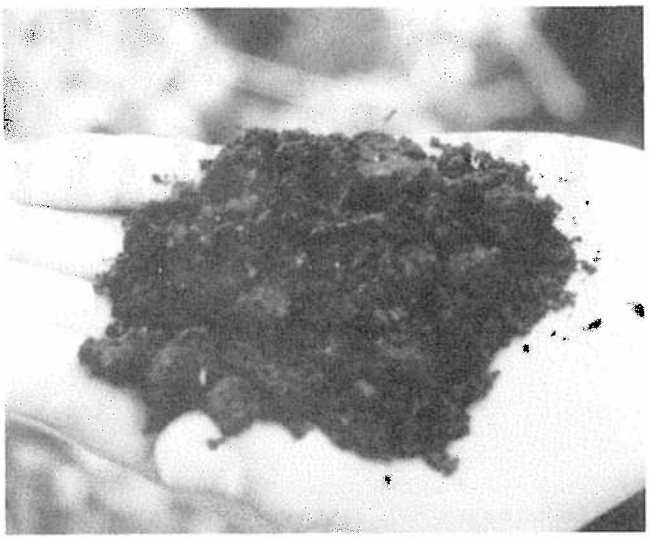
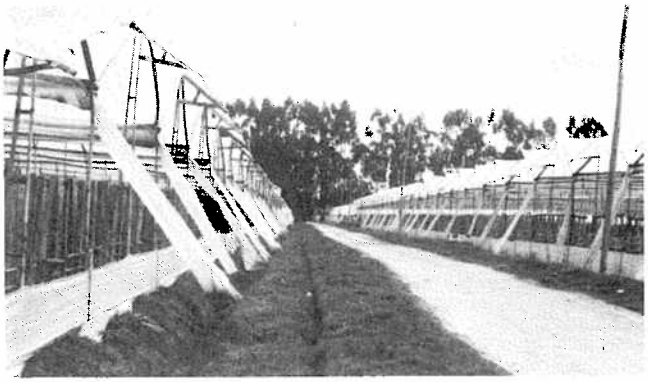
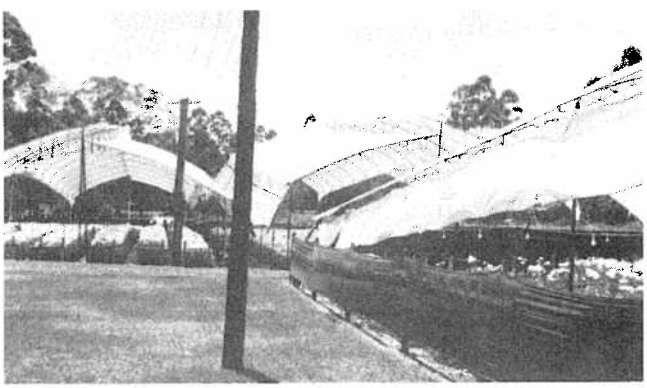


Fig. 1: Above: Typical sample of soil in the savanna around Bogota. Usually one to three feet in depth, 30% organic matter, and highly acid, requiring massive additions of superphosphate and lime. Extremely porous, giving some difficulties where trickle irrigation emitters are spaced too far apart.
Below: An attempt to show the typical massive bottom canes on roses grown in the cool climate of the savanna around Bogota (8600 feet elevation). Neither roses nor carnations are heated, resulting in long, heavy rose stems with consequent lower production. The acidic soils provide excellent foliage with no chlorosis often common in Colorado. In the lower left-hand corner is an Israeli trickle emitter.





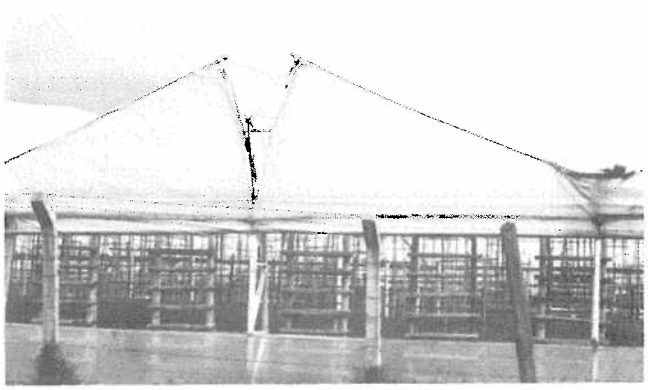


Fig. 2: Some fairly typical greenhouse structures in the savanna near Bogota. No heating or cooling, tall, with maximum area for ventilation, single layer polyethylene.

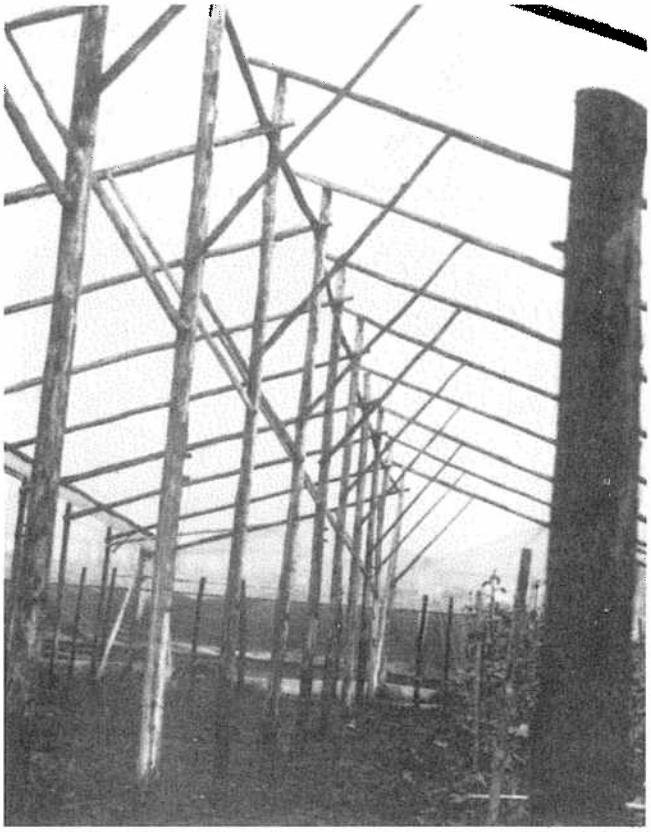


Fig. 3: Older, "pole" structure with single layer polyethylene. Generally, despite wood preservatives at the base, these must be replaced in a few years as they rot off.

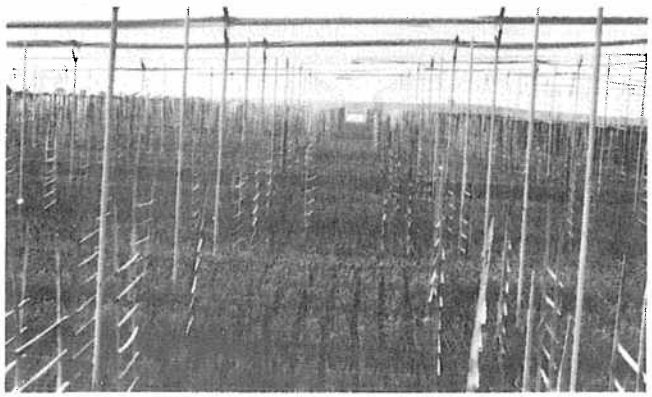
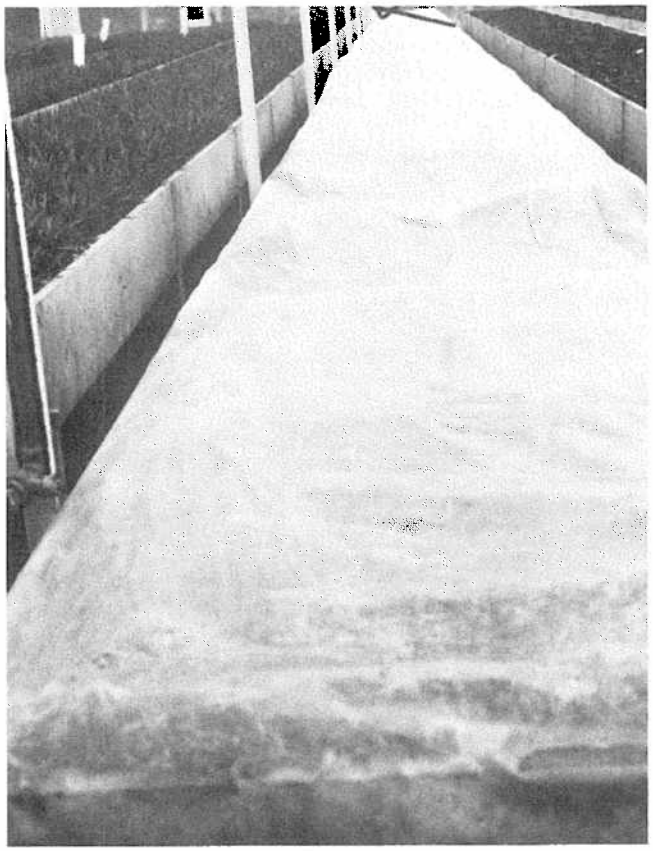
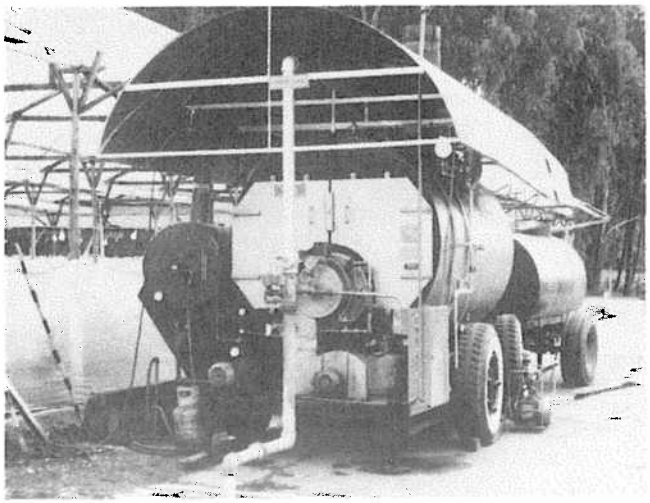


Fig. 4: Some interiors. Smallest range visited, approximately 17 acres, main production in the ground, although some propagation areas have moved to raised benches (bottom). The concrete benches are at least 12 inches deep, quite often using coal ashes for a medium, with Israeli trickle irrigation.

Fig. 5: A sample of "middle management" near Medillin. These are fairly typical young people with at least an agronomic degree from the local institutions. Several have studied in the states, with some women in areas of responsibility.

Fig. 6: A unique way of insect control (upper). The laborer is carrying a portable blower which is used to suck up insects from the crop canopy — a few shown on the right — acting both as a means to assess insect population and to reduce leaf miner damage. Below, a shoot tip transfer room for clean stock at one of the larger operations. In most instances, these facilities produce clean stock for the particular operation, and there does not appear to be much outside selling at this time.





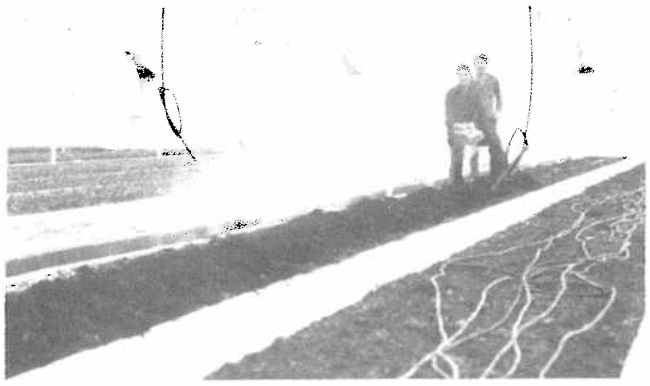


Fig. 7: Disease control in Columbia. Operations sometimes go to great lengths to eliminate disease. For example, in the upper picture, the plants are first killed by fumigating with chloropicrin or formaldehyde before removing them and steaming the bed. In the middle is a portable steam generator found in most of the larger operations. In the bottom picture, workers are preparing a bed for steaming by burying the pipes in the bench. With labor less than $5.00 per day, a lot of hand work is affordable.

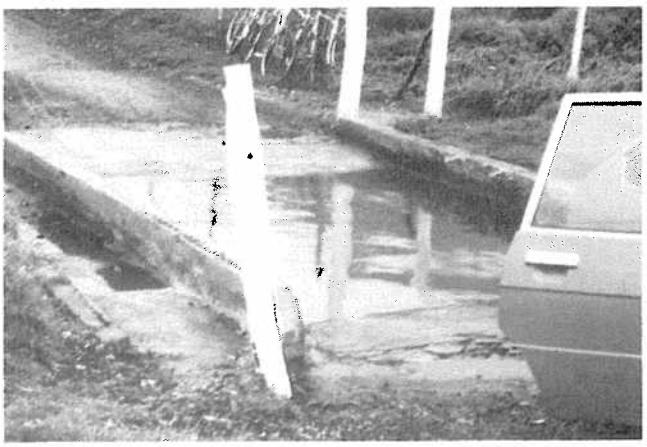


Fig. 8: These foot and car baths were a common sight at most ranges. Formaldehyde, a common disinfectant, with the baths being washed out at least once daily. They are maintained. There are few growers in the states that go to this effort to control diseases.

Fig. 9: Sign of things to come? At one range, I was told the variety 'Apollo', in the left picture, does not split. The usual standard carnation varieties must be banded. In the right picture, purported to show what happens when one can latch on to a resistant variety. Where the crop isn't in the foreground, had to be pulled out due to disease. The tall carnation crop in the background is resistant.

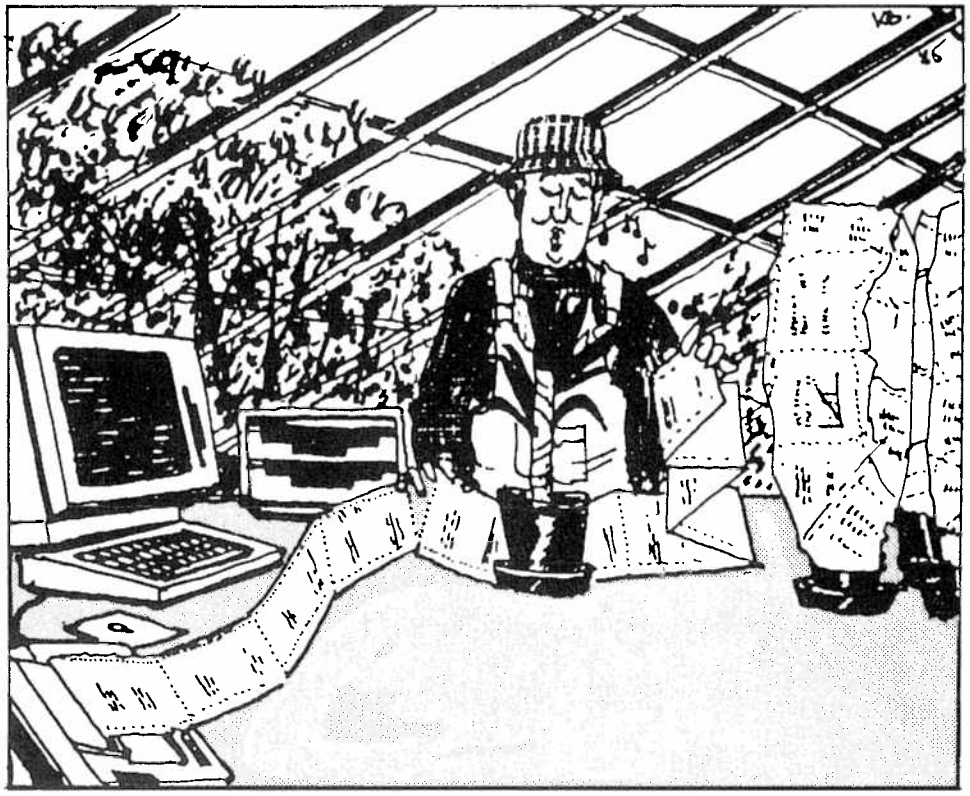
GREENHOUSE CLIMATOLOGICAL SUMMARIES

FORT COLLINS GREENHOUSE CLIMATOLOGICAL SUMMARY FOR FOUR WEEKS, BEGINNING NOVEMBER 3, 1985, AND ENDING NOVEMBER 30, 1985 (See CGGA Bulletin 426, December, for definitions.)

	Week beginning							
	Nov. 3		Nov. 10		Nov. 17		Nov. 24	
	Day	Night	Day	Night	Day	Night	Day	Night
Average outside temperature (°F)	50.0	39.0	25.7	20.3	20.3	16.7	24.8	19.4
Maximum outside temperature (°F)	69.8	57.4	38.3	29.3	37.4	0.3	50.0	41.4
Minimum outside temperature (°F)	17.6	21.0	12.2	12.2	5.0	0.5	2.3	4.0
Degree-days of heating	106	177	275	310	313	340	290	319
Average hours in the period	9	15	9	15	9	15	7	16
Accumulated total solar radiation (MJ/sq.m.)	62.2	0.7	44.1	0.8	67.8	0.6	46.5	0.7
Average relative humidity (%)	45.0	61.5	88.6	97.2	79.6	87.7	87.1	93.9
Maximum relative humidity (%)	98.2	100.0	100.0	100.0	96.9	100.0	100.0	100.0
Minimum relative humidity (%)	20.7	23.5	63.6	85.7	61.4	71.1	52.6	66.3
Average absolute vapor pressure (mb)	5.5	4.9	4.2	3.7	3.0	2.8	3.8	3.4
Average wind speed (mph)	2.2	1.6	0.9	0.4	1.3	0.9	1.1	1.1
Maximum wind speed (mph)	14.1	29.8	9.6	7.8	10.5	13.7	13.9	11.2
Average CO_2 concentration (Pascal)	20.8	—	21.5	—	21.1	—	21.6	—
Maximum CO_2 concentration (Pascal)	33.0	—	25.7	—	24.7	—	26.8	—
Accumulated gas consumption (cu.ft./sq.ft.)[1]	2.5	6.7	5.8	10.8	5.1	12.1	5.1	11.8

[1]Average gas consumption for single FRP and double layer, inflated PVF, total area = 3840 sq.ft.

Også inden for gartnerier er edb blevet til uvurderlig hjælp.



The EDB program is very helpful for gardeners.

Likely a lot of people think this is the best use for computers in greenhouses. Turn upside down for translation. From the *Gartner Tidende* (Danish) magazine for March, 1985.

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