Colorado Flower Growers Association

IN COOPERATION WITH COLORADO STATE UNIVERSITY
Doris Fleischer, Executive Secretary
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FRONTIERS OF FLORICULTURE - SOUTH AFRICA

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A good profit can be made on carnations in South Africa when the grower is returned 3 cents per flower. This is how it is done. Creosoted poles are set in the ground, or concreted in, and braced with heavy gauge wire. The structure is covered with chicken netting similar to that used for hail protection in Colorado. In some areas bamboo or saran is placed around the sides to give protection from wind which they have at times during the year. In most areas the wire screen structure is completely enclosed and the doors kept locked except during working hours. There is a tendency for the natives to take anything they can lay their hands on, especially during off hours.

It should be borne in mind that the seasons in South Africa are opposite those in the Northern Hemisphere. June compares to December and July to January.

Rooted cuttings of disease free stock are planted in the ground from May to July. In most areas May is considered best for it gives the plants a chance to become better established before the cold of July, which may be quite frosty at night. The plants are pinched once although occasional growths are pinched again. Plant spacing is 6 X 6 inches and 4 to 6 breaks per plant is normal. The first crop of flowers is cut to breaks with flower stems averaging 16 to 20 inches in length. The yield is more or less continuous from November to April (this corresponds to May to October in our climate). They are able to cut two complete crops of flowers in this summer period. Their big advantage is that their heavy production coincides with shortages of flowers in the Northern European markets.

After their summer and fall period is over they continue to produce flowers from these plants at a reduced rate but at substantially higher prices. Aver-

Fig. 1. Most carnations are grown under hail screen. The ground beds are spaced as they are in greenhouses.

age return to the grower last year was over 3 cents (US) per bloom during the export period. One grower shipped 1,750,000 flowers from 175,000 plants in 20 weeks, or about 12,500 blooms per day during the season. Taking it another way, he produced 8 blooms per sq. ft. of bed area per month for 5 months.

Production Costs

Breaking down their costs per plant we have the following:

Cost of wire, poles, land preparation, labor, fertilizer, and watering facilities	6.0 cents
Cost of rooted cuttings	4.5 "
Total production cost per plant exclusive of management	10.5 cents

If they return 10 flowers at 2.8 cents each, they would have 28 cents less the cost of 10.5, or a return per plant to capital and management of 17.5 cents. On a morgen, or hectare, basis they plant 264,000 cuttings in the 66,000 sq. ft. of bed area. With these figures, which are conservative, the return to management and capital is $46,000 per morgen or something over $20,000 per acre, not counting flowers sold on the local markets during their winter season.

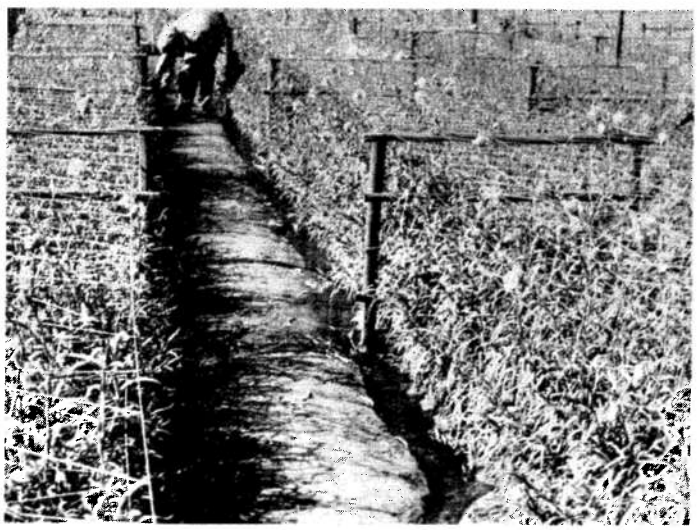


Fig. 2. Much of the watering is by flooding the individual beds.

This method of culture takes advantage of a mild climate that is relatively cool in summer. By growing carnations in the open ground in beds and under screen structures the cost of erecting the structure is low and watering is done mostly by flooding or overhead sprinklers. They may steam and treat the ground with Shell DD, or move the structure at about the same cost. Naturally they do not grow as high quality carnations as those grown in greenhouses in Colorado, but they are able to put a good flower in Central and Northern European markets in less than 24 hours at a cost that can be afforded by the man in the street. The people responsible for their marketing are thinking well ahead of their present production rate and believe production can be expanded many times its present rate of approximately 40 acres.

Fig. 3. Newly planted mother stock that has been mulched with wood wool (excelsior) and is being watered with overhead sprinklers.

Carnation Planting Stock

The firm of K. Stormly Hansen and his associates near Johannesburg has been producing disease free stock for 2 years. A recent shipment of mother plants coming into South Africa from Copenhagen involved 14 tons of rooted cuttings by chartered plane. These arrived about the 20th of August with a smaller shipment due later to complete their planting. Rolph Flowers is planting 1.5 million stock plants from August to September 15, and should harvest about 16 cuttings per stock plants for this next shipping season. Since these cuttings are being planted at the beginning of their spring, they will be in heavy production in summer when it is winter in Europe and when many European carnation growers like to plant for the next season. The cuttings will be shipped from

South Africa to Copenhagen and England for rooting and shipment to growers in Northern Europe. Considering freight, performance and other factors, Rolph Flowers and K. Stormly Hansen have concluded that a 9 gram cutting is best. There was an estimated 4 million cuttings sold in South Africa last year. 100,000 per acre would give 40 acres of commercial culture not counting a number of growers who propagate their own and grow in the open field without cover. Most of these open field growers are located around Tzaneen in the northern section of the country.

Another carnation propagator who is growing rapidly and who is producing exceptional stock is A. J. J. van Nieuwenhuizen. He is making contacts in Europe and prefers to ship rooted rather than unrooted cuttings. Transport costs are about twice that of unrooted cuttings but the European grower can get his cuttings 8 weeks sooner, counting rooting time and delay. He also gets cuttings with selected root systems and Mr. van N. claims that rooted cuttings travel better. This is subject to question, however. Mr. van N. prefers to build a direct business with growers rather than to sell through jobbers in Europe. In this way he hopes to decrease the delay sometimes experienced when cuttings are reshipped.

Other Structures for Growing

While growing carnations under hail screen and in the ground is the least costly and probably the most profitable, there are always growers who seek to do better. It should be borne in mind that among the primary advantages held by the grower under wire are these: 1. His structure is the cheapest possible and he can move it to new ground with a minimum of cost, probably cheaper than he can attempt to sterilize it. 2. Fewer problems arise with watering and drainage with plants growing in the ground. Some growers are able to flood irrigate while a great many use overhead "rainbird" or other types of sprinklers. These methods are much less useable once a grower has raised benches. The grower under wire has a major disadvantage in that he loses some flowers during rainy weather. He may also get some frost injury during July. His risks are high but his costs are minimum and his opportunity for profit is excellent.

Polyethylene covered structures are the next step in the evolution of greenhouses in South Africa. Most of these are made of unpainted lumber without ventilators and are built around cooling fans. As soon as one goes under tight coverings the houses are too hot during the bright days so ventilation and cooling must be done. Locally produced lumber is cheap and Gerpak polyethylene from America has lasted from 8 to 15 months depending on the way it was installed. Keep in mind that the ultraviolet radiation at this altitude of 5-6000 ft. is similar to that of Colorado. In general, the growers build the structures to fit the polyethylene so one continuous sheet will cover a given area. There were both ridge and furrow and separate houses. They find that polyethylene lasts longer when the tack strips are the same width as the bars and are left unpainted. Another observation made is that polyethylene houses will be as much as 5 degrees cooler than the outside air temperature at night, any time of the year. This is especially a problem in winter for it can frost heavily inside a house and not frost outside.

One ingenius method of installing polyethylene was noted at the farm of Geoffrey Botha. He stretches heavy gauge wire lengthwise of the house, pulls polyethylene over this wire then stretches a second wire over the outside of the polyethylene. The film is sandwiched between the two heavy wires (Fig. 4). This method has been found to reduce the life of polyethylene 2 to 3 months, but it is an excellent way of fastening it down.

Fig. 4. Polyethylene sandwiched between two heavy gauge wires--G. Botha in foreground.

During the first crop or two under polyethylene, growers continue to plant in the ground. Sooner or later they must use raised benches as a disease control measure. Shell DD is used at first for nematode control. As disease becomes more of a problem, they build raised benches so the soil can be more completely steamed. This adds to the cost of production but the producer is gaining environment control and reducing his risks.

The next evolution in structures is with well engineered ridge and furrow houses using glass about 2 by 3 ft. The houses are usually 4 bench width and have beautiful gutters (Fig. 5). The cost of erection with fans is a little over $1.00 per sq. ft. There are no ventilators other than the openings opposite the fans where pads are placed. Quite a few ranges have been built in the last year with this construction which was engineered by a German firm brought out to South Africa by Rolph Flowers.

It should be borne in mind that South Africa probably leads all countries in the engineering of ventila-

tion because of their extensive mining industry. Their fans are very efficient and are engineered to move a maximum amount of air per unit of current. The greenhouse industry has had considerable help on greenhouse cooling from one of their government engineering research institutes.

Fig. 5. The well-engineered glass houses presently being erected in South Africa.

Lumber suitable for bench construction is scarce so transite and concrete are used. These materials are expensive so add to the cost of growing.

Heating

Very little heating is required in most of the flower growing areas of South Africa. Some growers are heating during winter to produce better quality and the variety of heating systems in use leaves little to the imagination. One firm blows the greenhouse air across a heat exchanger and back into the greenhouse through polyethylene ducts. This operation is accomplished by the exhaust cooling fans. A combination of heating coils and Dutch Mill fans installed in the ridge of the greenhouse is also used by several growers. The flowers grown under wire screen have no benefit of heat, and most of the structures either have very little heat, or poor heat control. Split carnations are a rule rather than an exception during cold weather. South Africa ships into a market that accepts split carnations provided they are repaired. The few greenhouses that have good heat control have much less calyx splitting and fewer malformed flowers, but their costs are considerably greater. During winter when they sell locally these flowers bring a premium, probably paying for the additional heat control.

Some fiberglass construction is in evidence in South Africa though it is still expensive. The promise is that the price will come down as it has in America. Fiberglass would give additional advantage for unheated greenhouses in that the solar heat absorbed in the soil and plants during the day would remain longer during the night. The temperature might possibly remain as much as 5 degrees above that outside. With polyethylene, the reverse is true. Fiberglass would also give protection from hail, a problem common to most of their high altitude flower growing areas.

A most interesting observation on the effects of summer night temperatures has been made by Basil Bands, an alert young grower for the Craibs near Pretoria. He has noted from his records that flower quality goes down rapidly as soon as summer night temperatures in the greenhouse begin to exceed 55 or 56 degrees.

Other Crops in South Africa

There are a number of firms growing other crops. Gladiolus is probably second in importance and Dutch bulbs third. Roses are grown in the field with some new plantings being made under glass. Many of the miscellaneous bulbs that are native to South Africa are undergoing improvement and may be available to us before long.

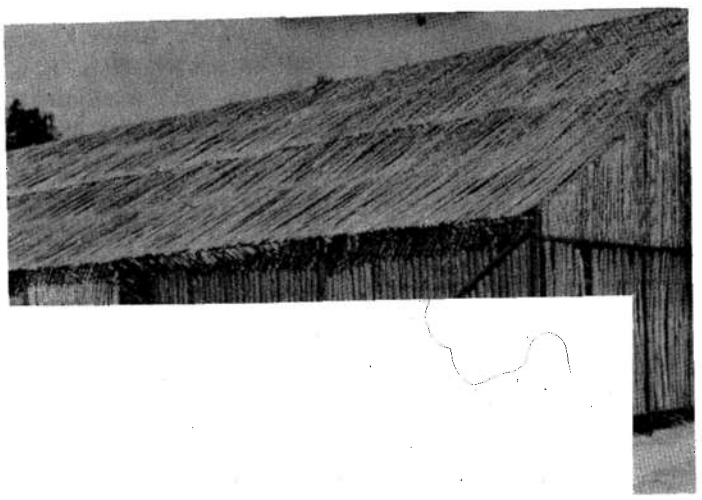
Bulb Crops

The Harry Deleeuw Co. Ltd. near Johannesburg is engaged in the improvement of numerous bulb crops. They are a branch of the well known Holland firm and many of their key people are Dutch. They have found that as good or better daffodils, hyacinths, and tulips can be grown in South Africa and most of their crops flower in August and September. They also produce outstanding amaryllis bulbs in 3 years from seed or bulblets. This bulb production is greatly facilitated by a strain of amaryllis that produces bulblets freely, a characteristic not common to most strains of amaryllis. The Deleeuw Co. has an additional area in the northern part of Transvaal where they are also growing outstanding bulbs.

The native bulbs which they are improving are the arum lily (calla), Lachenalia, Sparaxis and Veltheimia. These are beautiful flowers but only the calla is familiar to most of us. Most of their amaryllis and a lot of their other miscellaneous bulbs are being shipped to New York. Their Dutch bulbs go to Holland and some are probably shipped from there to New York. Mr. Fleur Barnhoorn, manager of the South African firm, is a sharp observer and is doing some very fine work on the improvement of bulbs. One of his major techniques is clonal selection, or the finding of outstanding individuals, multiplying them in small rows, and selecting the very best single bulb progenies for multiplication. Some of the clones he selects have reduced virus symptoms. This technique is similar to that found effective with carnations at Colorado State University.

Another Dutch firm managed by Mr. Hogewoing is doing similar work with bulbs. They are producing quite a lot of the native chinkerinchee (Ornithogalum) bulbs as well as amaryllis for Northern Europe. In

addition they flower retarded tulips, Dutch iris and roses for local markets. They are exporting several of the Dutch bulbs and chrysanthemum cuttings. Their planting of Garnette roses for local sales and for possible export are in open ground. While they have excellent buildings and facilities, only the chrysanthemums are propagated in a glass house. All other crops are in open ground or under slatted shade structures.



Mr. Elro J. Braach has a large range of glass and saran near Pretoria. He also grows carnations under hail screen. He has been trying many types of construction to find the best for that climate. Among the crops produced in quantity on this place are chysanthemum cuttings, flowering pot plants, foliage plants, gerbera, roses (under glass), and very fine anthuriums. Mr. Braach lacks knowledgeable supervisory help, but this is a common deficiency in the South African flower industry. There are tremendous opportunities for young men who have a pioneering spirit, can think big, and produce. Braach has probably the best retail florist shop in South Africa, located in Pretoria, and also sells florist supplies.

Rose Culture in South Africa

While the rose flower industry is still small, there are opportunities for producers of roses of the right varieties both for local winter sales and for export to Europe during summer. Most of the roses are grown in open ground. The understocks are rooted in the place where the plants are to grow. Dr. J. C. Strydom of the Pretoria Research Station has developed a method of skin budding of roses which can be done during the winter whether the bark is slipping or not. He is using the cultivars Clarke and Brooks of R. multiflora which are well suited to this method of budding. By sticking the cuttings in the field where the plants are to flower during February (late summer) they may be budded by the middle of May, or about 3 months after planting. This budding can be continued through the winter until spring. Bud wood is cut directly from dormant rose bushes in the field. After the buds are well healed the top of the rootstock is broken over but not broken off. This bending, or breaking over, is done 4 to 5 weeks after budding. The buds normally start sprouting by the middle of August and will cut good crops of flowers the following summer. The variety Baccara is one of the most popular in South Africa for shipment to **Europe. Tropicana (Super Star) is also being planted.**

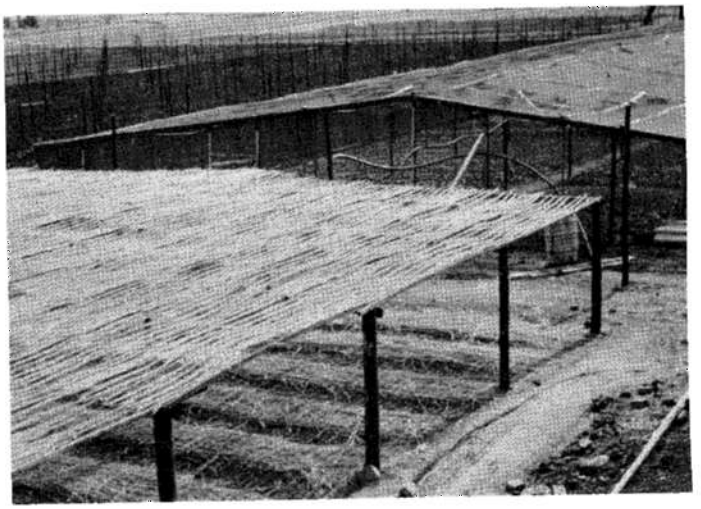


Fig. 7. Another shading structure for protecting certain bulb crops.

A more detailed report on rose propagation and the rose industry in South Africa will be made later.

Fig. 8. A planting of roses that will be budded in place and covered with hail wire before the hail season. Buds just starting to sprout.

Marketing and Transport

Two major organizations are shipping most of the South African flowers at present. Multiflora, a cooperative, serves one group of growers, while Rolph Flowers serves another. At Multiflora, flowers are

sold at auction and 4 or 5 auctions go on at the same time in their auction room. Multiflora also exports flowers.

Rolph Flowers sells for a number of the growers in the area and buys additional flowers from the auction to make out their shipments. Rolph Flowers also has a strong interest in both an export company and a transport company, since transport is so very important to the flower industry.

South Africa enjoys a low commodity rate on air shipment of flowers to Europe. Air freight costs them 25 to 40 cents per pound depending upon the size of the shipment. The cheaper rate applies to shipments over 500 pounds. The commodity rate was not difficult to obtain for many of the planes bringing electronic and other high value manufactured equipment to South Africa were returning to Europe nearly empty. Flowers, fruits, and vegetables now fill this cargo space at favorable rates. South Africa can send floral and nursery stock to New York for $1.07 to $1.50 per pound while the rate from New York to Johannesburg is nearly double this. The reason for this is that so little nursery stock has been sent to South Africa that a commodity rate has not been obtained. This is true on rates from the US to almost all other points as well.

In conclusion, I would like to add that South Africa is entering flower production at a late date. In so doing, they are able to capitalize on the advancements made in this industry. Their industry is fortunate in having alert people capable of thinking and planning for the total industry. They are also capitalizing on a fine climate, opposite seasons, and superb transport at reasonable rates. South Africa is certainly a floricultural frontier.

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FIRST CLASS