THE CULTURE OF FLOWERING PLANTS IN THE LOW AND MID COUNTRY OF CEYLON

By

D. T. EKANAYAKE

Assistant Superintendent, Botanic Gardens

CLIMATE

AS is well known, climatic factors influence plant growth profoundly. The Low Country of Ceylon extends from sea level up to about 1,500 ft. elevation. Here, the shade temperature is about 85°F., and the rainfall is about 80-120 inches, well distributed throughout the year. The Mid Country extends from 1,500 ft. up to about 4,000 ft. elevation. The rainfall is heavy, and the temperature is mild. Day length varies from 11.5 hours to 12.5 hours. Most of the annuals grown in the low and medium elevations are temperate or sub-tropical in origin, and hence their cultivation in Ceylon requires special attention. Planting should be arranged in such a way that flowering occurs during the dry spells. Wet weather generally spoils blooms as well as retards the formation of flower buds. The dry season in most parts of the island is from March to May. The growing period up to the formation of flowers varies in different species of flowering plants. Annuals like Phlox and Petunia take about 3 or 4 months to flower, while Zinnia takes only about 6 weeks. When planting annuals or perennials, it is advisable to avoid heavy rains. However, light showers are beneficial for their establishment. Unlike in the hot, humid low country, a wide range of annuals and perennials can be grown in the mild mid country. The large-flowered Dahlia thrives at Peradeniya, and produces excellent blooms. In Colombo, the cultivation of the large flowered Dahlia is extremely difficult.

PREPARATION OF FLOWER BEDS

MUCH depends on the initial perparation of flower beds. Most of the commonly cultivated annuals and perennials require a rich, well-drained soil. The soil should be well dug, and where the soil is very

sandy as in certain areas in Colombo, the top soil should be dressed with some clayey soil. Where the soil is heavy sufficient sand should be added. A dressing of lime improves clayey and acid soils. Generally a dressing of lime is recommended before manuring the flower beds. Later well rotted cattle manure and leaf mould should be incorporated into the soil, and the level of soil in the bed should be raised 2 or 3 inches above ground level. This facilitates drainage, and contributes to better display of plants and flowers. In the dry zone, however, the level of soil should be lowered a few inches below ground level to conserve moisture.

PROPAGATION OF ANNUALS

ANNUALS are generally propagated from seed. When temperate annuals are grown in tropical countries, the quality of the flowers degenerates in successive generations. Therefore, for better results, seeds have to be imported for every new planting season.

Boxes are the best for germinating annuals. These seed boxes can be made of old packing cases. The normal size of a seed box is 20 in. × 13 in. × 4 in. (Fig. 1). Seeds may also be sown in pans. Drainage holes should be provided both in boxes and pans. The soil medium for sowing seeds is made up as follows :

2 parts sifted loam,
1 part leaf mould,
1 part sand.

Before filling the boxes with sand, crocks should be placed at the bottom of the box for drainage (Fig. 2). Over the crocks, a layer of dry leaves is placed (Fig. 3). The box is then filled and surface levelled with a flat piece of wood (Fig. 4). The seeds should be sown on the levelled surface, and covered with a thin layer of soil. (Fig. 5). Generally large seeds are sown just below the surface. In the case of tiny seeds, only a sprinkling of sand on top is necessary. After sowing, the seed boxes are watered with a can provided with a fine rose. (Fig. 6). In the case of very small seeds, overhead watering is not desirable. Hence, the boxes may be placed in water which is allowed to seep up. The time taken for the seeds to germinate depends on the respective varieties. Some varieties like Phlox take about 2 weeks to germinate, while others like Zinnia take only 2 or 3 days. It is important to protect the young seedlings from excessive sunlight. However, they should not be kept under deep shade. The seedlings should be exposed to the morning sun. Great care should be taken when watering the seedlings. Excessive watering causes " damping off ", the fungus attacking seedlings just above ground level causing

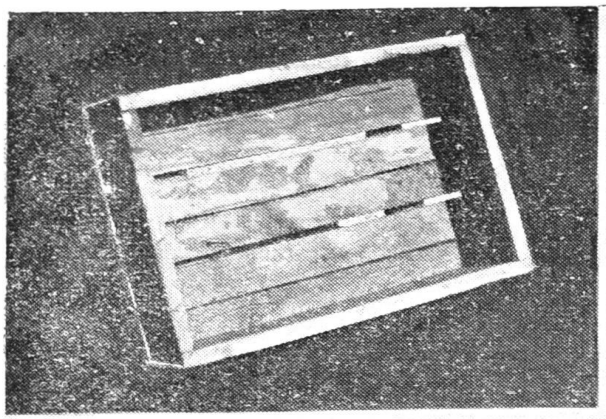

FIG. 1.

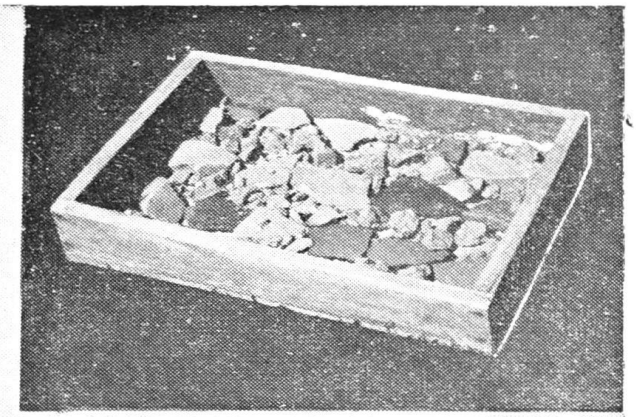

FIG. 2.

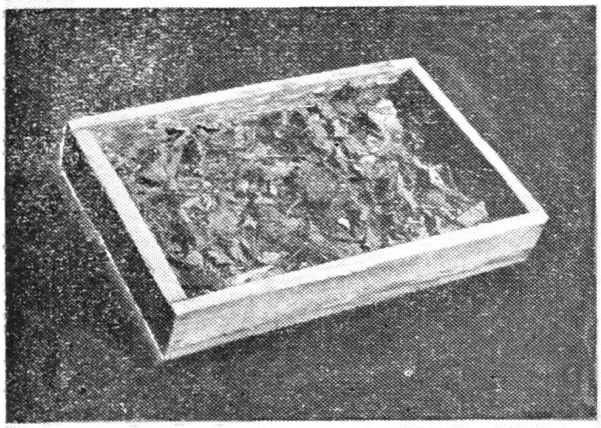

FIG. 3.

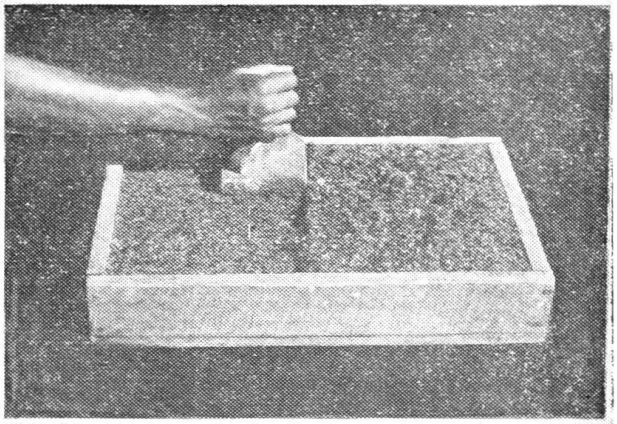

FIG. 4.

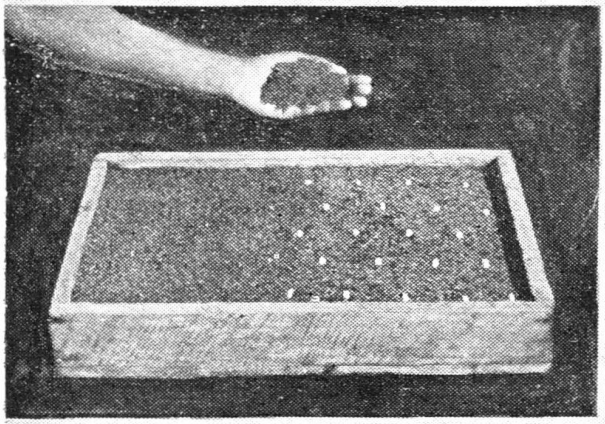

FIG. 5.

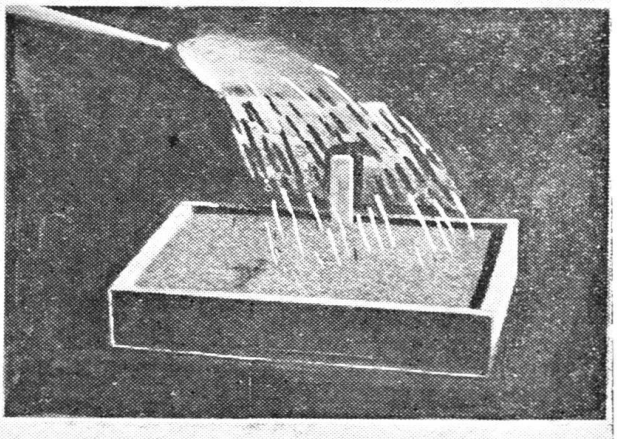

FIG. 6.

(1) Seed box.
(2) Seed box with crocks placed at bottom.
(3) Seed box with layer of dry leaves over crocks.
(4) Levelling surface of seed box over crocks.
(5) Covering seed with a thin layer of soil.
(6) Watering seed box.

the seedlings to fall over. The disease is very common during wet weather. When the seedlings are about 2 or 3 inches high, they should be transplanted in beds.

CARE OF SEEDLINGS AND ADULT PLANTS

AFTER planting in beds, the seedlings should be shaded from excessive sunlight till they are established. When the seedlings are established, regular tillage is essential. Forking the soil around the plants facilitates the admission of air into the spaces between the soil particles. Secondly, tillage improves the water absorption capacity of the soil, and finally tillage helps in the penetration of roots in the soil.

Watering the seedlings and adult plants is necessary during dry weather. But the soil should be examined before watering to check wether the soil is damp. Some plants are deep feeders and although the surface soil may appear dry, the deeper soil layers may contain sufficient water for the plants. In such cases it is not advisable to water the plants, as excessive dampness in the soil causes a condition called physiological drought. Physiological drought causes the plants to wilt due to lack of air. In general, plants should not be allowed to suffer due to lack of water, but should be watered only when they need water.

ARTIFICIAL MANURE FOR GARDEN FLOWERS

AN application of a fertilizer mixture is beneficial during the growing period of the plants. The following mixture has been found satisfactory in all areas in Ceylon—

2 parts sulphate of ammonia,
2 parts superphosphate,
1 part sulphate of potash.

This mixture should be applied at the rate of 3 oz. per sq. yard. After application, the beds should be heavily watered. In the alternative, an application of a liquid fertilizer like Hyponex is recommended.

PESTS OF GARDEN FLOWERS

Slugs and snails: They are troublesome pests, especially when the plants are small. Slugs and snails are abundant during wet weather, and a vigorously growing group of seedlings is liable to be destroyed overnight by them. They are best destroyed by using one of the proprietary brands of slug bait.

Insects : These insects are controlled by hand picking or by using suitable insecticides. The control of insects with the aid of insecticides depends on the feeding habits of insects. Insects are divided into two groups depending on their feeding habits.

(*a*) Biting insects.
(*b*) Sucking insects.

Biting insects are destroyed by using stomach poisons, while sucking insects are destroyed by using contact poisons. The most troublesome biting insects attacking garden flowers are caterpillars, beetles, cut-worms, maggots, and beetle larvæ. These insect usually bite the young leaves and buds of plants. If they attack flower buds and flowers, they should be controlled by hand picking, as spraying an insecticide may damage the flowers. Biting insects in foliage are generally controlled by lead arsenate spray which is made up as follows :

Lead arsenate	..	1 oz.
Water	..	1 gallon.

The disadvantage of spraying the plants with lead arsenate is that the spray leaves a white stain on the foliage. Cut-worms are destroyed by using insecticides like Intox 8 or Aldrin.

The most troublesome sucking insects among garden flowers are aphids and other greenfly, mealy bugs, scale insects and capsid bugs. Scale and capsid insects are very resistant to insecticides, and special insecticides have to be used against them. Sucking insects are destroyed by using Nicotine sulphate, D. D. T. Gammexane and Basudin 60. Red spider which is a troublesome pest during dry weather is controlled by using insecticides like " Fernasul " or " Thiovit ".

DISEASES OF GARDEN PLANTS

DISEASES in garden plants are few compared to pests. In most cases these diseases are peculiar to certain genera, species and varieties.

Damping Off : This is a very common disease in seedlings caused by soil-borne fungi. The disease is observed during wet weather. The first sign of the disease is wilting followed by a constriction of the plant at ground level. This is brought about by the destruction of the outer tissues of the plant by fungi. The disease is encouraged by damp soil. The disease is controlled by using sterilised compost for sowing seeds. An alternative method of control is by watering the seed boxes with Cheshunt Compound which is made up as follows :

Ammonium carbonate	..	11 parts.
Copper sulphate	..	2 parts.

The two chemicals are mixed, and allowed to stand for 24 hours in a sealed tube. The solution for watering is prepared by dissolving 1 oz. of the mixed powder in 2 gallons of water.

In addition to damping off, there are several other plant diseases such as mildew, leafspot, blight, rust, rot and virus diseases. Mildews form yellowish patches on the upper surface of leaves and a powdery growth on the lower surface. Mildews are caused by fungi. In leafspot, certain areas of the leaves are destroyed by fungi causing spots. Blight causes the leaves to wilt, wither and decay. This is caused by fungi as well as bacteria. In rots, the stem becomes soft giving out a putrid odour. Virus diseases are caused by minute organisms. But methods have not yet been determined to control them. Usually virus diseases are spread by insects. In such cases, the virus disease is controlled by checking the insect vector.

Most of the plant diseases caused by fungi are controlled by the use of fungicides. Plant diseases could be controlled by the well known Bordeaux Mixture which is made up as follows :

Copper sulphate	..	5 lb.
Quick lime	..	5 lb.
Water	..	50 gallons.

The Copper sulphate and quick lime are dissolved in water separately. The two chemicals should be mixed in a wooden container, and the remainder of water added.

A number of proprietary brands of Copper fungicides are available in the market. Copper fungicides are suitable for the control of most fungal diseases including leafspot. In general, Sulphur in the wettable form is an effective remedy for most fungal diseases.

Bacterial wilt is one of the most difficult diseases to control. Wilt has been observed in Zinnia. In such cases, the wilted plants should be removed and destroyed immediately, else the disease may spread into healthy plants. In recent years, antibiotics like Streptomycin have been used to control bacterial wilt.