

Prospect and Future Strategy:

The prospect of using seeds and dry sets derived there from, in the propagation of Vethalam onions is a great step forward in the expansion of acreage and reduced costs of cultivation. One of the greatest restrains in Red onion cultivation is the storage of bulbs as planting material and the resultant loss of weight during storage. Also large quantities of bulb could be released for consumption purposes. They heavy cost of bulbs for planting, scarcity of bulbs during certain planting times and the heavy cost of transport of bulbs could be avoided if other planting materials are available.

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SOME OBSERVATIONS  
ON THE POTENTIAL OF LOCAL H ONEY BEES  
FOR HONEY PRODUCTION IN SRI LANKA.

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BY

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1. Introduction:

The world's land areas which enjoy a tropical or sub-tropical climates are subdivided by oceans into four well separated regions (Crane, 1976). Africa with its off-shore islands, is the only region with native tropical subspecies of Apis mellifera and Asia has three native tropical species, Apis cerana, A. dorsata and A. florea. America and the Caribbean islands have native tropical stingless bees, but no Apis while the Pacific islands, with the exception of the region of New Guinea, have no native honey producing bees (Crane, 1976). European subspecies of A. mellifera have been introduced into various tropical regions by man and they are reported to be performing well only in some regions (Koeniger, 1976).

In Sri Lanka, in addition to the three Asiatic honeybees, the stingless bee Trigona iridipennis, is widely distributed (Koeniger & Vorwohl, 1979).

The agricultural system in Sri Lanka provides good bee forage due especially to the rich variety of weeds. But centuries old tradition has been honey hunting rather than bee keeping. State-aided bee-keeping initiated by the Sri Lanka Department of Agriculture is of recent origin but honey collection from natural sites goes on. This is for the most part confined to A. dorsata, and is not in fact so unreasonable as it may appear since A. dorsata, is characteristically a migratory bee, and little or nothing can be done in practice to change this behavioural feature. More-over, A. dorsata operates chiefly deep in forest areas, quite away from human settlement.

## II. Honey Production from Hive Bees:

The use of A. cerana in domestic hives in Sri Lanka can be traced back to the early part of the nineteen twenties when great interest was shown in plantation agriculture, horticulture (Baptist, 1976) These attempts were based entirely on the knowledge of A. mellifera, and the equipment and procedures used for this bee in the west. Apparently all these efforts ended with little success till beekeeping with A. cerana started to be guided chiefly by the experience in South India. Those beekeepers close to established forest or those who were able to transfer their colonies to different areas according to honey flows prevailing were successful obtaining something like 12 kg honey per colony from the best colonies, (Perera, 1960). However, if the average yield of all the colonies kept by a beekeeper, over a range of some years was considered, the average was reduced to not more than 4 kg per colony (Baptist 1976). This could be considered a poor average and reasons for the same appeared to be that in many areas of the country there were no very specific or prolonged seasons of proper flowering for an adequate honey flow. This tends to favour the development of strains which maintain a small colony size, and perhaps an excessive swarming habit.

### III. The Essence of Beekeeping

Jay (1979) defines beekeeping as 'managing honeybee colonies in such a way as to : (a) obtain a large (or maximum) adult colony population to coincide with the major honey (nectar) flows in the area, and (b) utilize this population to the beekeepers greatest advantage for storing honey and/or pollinating crops:

In order to be successful, the beekeepers must determine when their main honey flows occur so as to build up colony populations in preparation for these main flows. At the same time they must decide what to do with colonies during the post-flow periods. In tropical regions the main honey flow follows a heavy rainy period. The more predictable the main flow, the easier it is for the beekeeper to prepare large colony populations at the right time for it. Often it happens that colony populations are built up on the main flow, instead of achieving the peak population during the main flow.

### IV. Honey Flows: time and sources

In Sri Lanka, where a well defined bi-modal rainfall pattern exists, there are two periods of nectar flow (Fig.1) The first being Feb. - March which is the period subsequent to the North-East monsoon rains while the other is July-August which is the period just after the South-West monsoon rains.

Apart from the natural forests, which are potentially the best sources of honey flows in Sri Lanka, the following sources can be considered as potential honey flows (Baptist, 1976).

- i. From plantations of eucalyptus at the mid-country elevations, now quite appreciable in extent, particularly the Uva Province of the island (July, August and September).
- ii. From rubber plantations, especially in the south western region (February to April).

- iii. A regular flow from coconut plantation.
- iv. From annuals such as mustard (Brassicaceae), gingelly and some weed species).

Rubber (Hevea brasiliensis), in which the nectar is secreted by extrafloral nectaries, is a very important honey source in South India, Sri Lanka and Malaysia (Crane, 1980). A cerana can be moved into the rubber plantation for the flow and out again afterwards. The rubber plant produces no exploitable pollen, so colonies can not easily survive in unmixed rubber areas. It is reported that there are 7 million hectares of rubber in 22 tropical countries altogether, with an optimistic estimate of annual honey producing potential of 125 thousand tons (Crane, 1980). In Sri Lanka, total rubber acreage constitute about 226,599 ha. (an-onymous, 1980)

Pollination requirements of many tropical crops are not yet known but cardamon (Eletharis cardamomum), an important Asian spice crop was visited by all the Asiatic Apis, and that the presence of honeybees increased fruit set by 22% and 37% in two different cultivars. In one area 98% of the insect visitors were honeybees (Crane, 1980). Koeniger & Vorwohl (1979) examined microscopically 51 comb samples with honey and pollen stores in Sri Lanka, and they identified and listed 46 pollen types.

Fernando (1978) reported on the physico-chemical characteristics of four types of Sri Lanka honey, including one from extra floral rubber nectar and they confirmed reasonably well with the Indian standard specification for honeys of A. cerana, and also with the European regional standard for honey.

## V. Bee Management

In Sri Lanka, there is substantial knowledge with regard to the major nectar and pollen yielding plants visited by the bees (Baptist, 1976), Koeniger & Vorwohl, 1979). The same knowledge should be further strengthened by making surveys to record the flowering periods of those plants, as Hodges (1978) has done in England. Keeping seasonal records of

the weight of test colonies kept on scales would be of immense value while studying the farming practices of various regions along with the weather records which should also be done.

Once the flows are accurately known, emphasis can be placed to build up colony populations accordingly. While doing this, proper attention should be paid to the queen rightness and queen performance of each colony. Careful consideration should be given to apiary sites and arrangement of colonies within apiaries. Control of pests, diseases, and swarm prevention is of utmost importance and the provision of adequate hive space for brood and for nectar should be done (Jay, 1979).

During the post flow period the colonies should be maintained at reduced populations. This can be achieved by using surplus bees to increase number of colonies to a new source of forage when one flow ends is also a useful practice (Koeniger, 1976).

## VI. Migration in Honeybees

The natural migration of A. cerana colonies from apiaries when nectar and pollen sources in the neighbourhood fail is a common thing and the capture of migratory swarms on the other hand is a part of bee keeping management. Swarming has to be understood as a result of natural selection and under tropical and subtropical climatic conditions, survival of small swarms is possible. Bees therefore use their honey stores for colony division (Koeniger, 1976). Koeniger coupled the small honey yields of A. cerana with the swarming behaviour. According to him, as soon as a colony reaches a population of around 20,000 bees, swarming will start, and the size of the swarms is remarkably small, numbering no more than 2,000 bees and one young queen. Koeniger & Koeniger, (1980) reported that A. dorsata has a regular annual cycle migration in Sri Lanka. In February, the colonies are spread throughout the coastal plains and the north central region. In June and July they migrate to the hill-country which they leave again in October-November. It appears that the behaviour patterns of migration, the life history of the colonies at the

new site, and their return to the original area have not been studied systematically but is a necessity.

Sometimes tropical honeybees abandon their nesting site altogether which is called absconding. Rahman (1945) stated that the causes of swarming and absconding are the same, heat, lack of ventilation in the hive, a poorly laying queen or lack of space in which to lay - except that swarming is also precipitated by lack of storage room. These similarities indicate that swarming can be regarded as modification of absconding. Baptist (1976) reported that heavy rain during the two monsoonal periods in Sri Lanka leads to the invasion of wax moth attack, resulting in fouling of combs and absconding by the colony of A. cerana.

#### VII. Hazards in Tropical Beekeeping

In general, diseases are less troublesome than predators in tropical Asia, though Nosema disease has been reported in several countries (Crane 1980). Hazards of tropical beekeeping includes the prevalence of predatory wasps, birds, bears, flying squirrels and various mites, floods in the monsoon season and attraction of bees into 'toddy' pots when palms are tapped. It has also been reported that monkeys attack hives in tropical countries (Crane, 1980).

#### VIII. Concluding Remarks:

The incompleteness of the knowledge on the biology and behaviour of the three Asiatic species of Apis has been expressed by several participants at the Second International Conference on Apiculture in Tropical Climates held in New Delhi, India, during Feb.- March, 1980 (Crane, 1980). In fact, this has been one of the obstacles in the development of apiculture in the tropics. Therefore, much more emphasis should be directed on research in these fields in the years to come.

In Sri Lanka, some work has already been done to determine the suitable vegetational areas to promote beekeeping and now it is of importance to secure productive strains of the local honeybee and then to

select, breed, and multiply these strains. An efficient and economical system of bee management should be worked out. At the same time, an applied or extension program to test effectively the findings of investigational work should be developed and established. Achievements in South India with A. Cerana under conditions which are quite comparable to those in Sri Lanka, could be taken to indicate potential in Sri Lanka as well.

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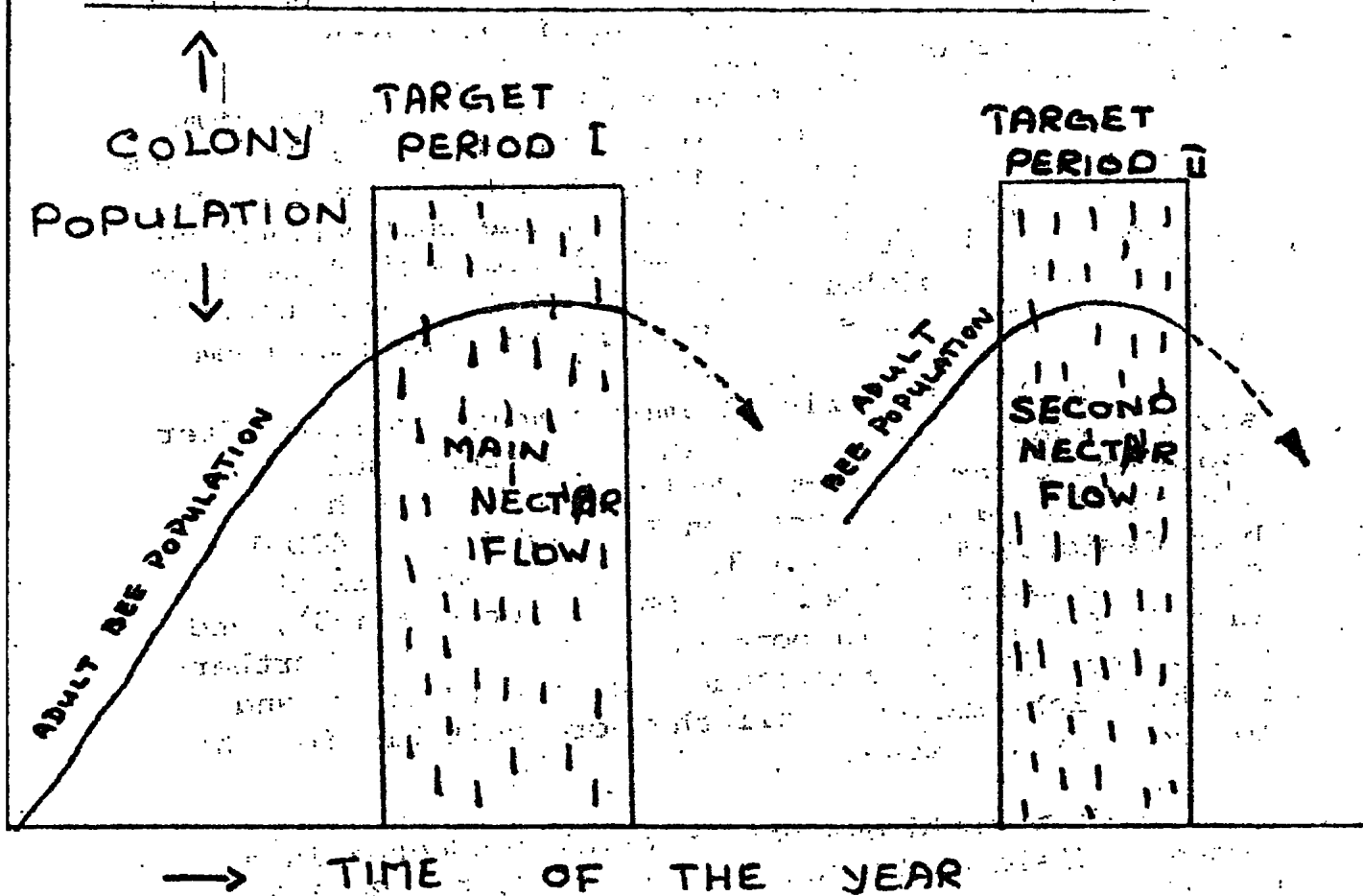


Figure 1

NECTAR FLOWS OF SRI LANKA AND  
 THEIR RELATIONSHIP WITH  
 COLONY BUILD-UP

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