

caterpillars hatching out of the eggs laid by the two moths were therefore reared separately in pot plants inside wire gauze cages. It was found that both the spotted and spotless forms were got from the progeny of either. It was also observed that there were gradations even in the size of the black spots. Some moths had prominent spots with about 100-150 black scales while others had very few such scales. So it looks as if there is only one species of *Scirpophaga*. Detailed studies including the examination of the genitalia of moths and rearings of larger number of caterpillars are in progress to confirm the results already obtained.

Agri. Research Institute,  
Coimbatore.  
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M. C. Cherian,  
C. K. Subramaniam.

## EXTRACTS

**Jelly Making.** One of the most important things in making jelly is to get the fruit at the right stage. Half-ripe fruit is necessary to make good jelly. The proportion of sugar is generally 1 cup to 1 cup of liquid. Boil juice for 10 to 15 minutes. Add sugar and boil quickly from 10 to 20 minutes when it should be tested by putting a little on saucer. Any strong material with a close weave answers almost as well. Before straining jelly, the bag should be wrung out with clean, hot water. The last of the liquid should be allowed to drip slowly through the bag unaided by pressure. To strain small quantities of jelly, reverse a chair and place the seat flat on the table, tie cloth to the four legs, and place bowl under cloth.

**Recipes.** Apple Jelly.—Take as many apples as required, windfalls will do, and small ones are the best. Place in a preserving pan with enough water to cover them; when boiled to a pulp, do not stir, strain through a jelly bag, and to every breakfast cup of juice add three-quarters cup of sugar. Boil briskly until it jellies, and pour into jars. Exclude air from jars either by covering with paraffin wax or paper moistened by being applied to jar.

Lemon jelly.—4lbs. of lemons cut in slices in 4 quarts of water. Let stand all night. Boil for half an hour. Stand until next day, strain through flannel. A cup of sugar to cup of juice. Boil from 20 to 30 minutes.

Quince Jelly. 6lbs. quinces, 5 pints of water, sugar. Wash fruit and cut in small pieces. Put in pan with water and stew slowly, mashing from time to time until fruit becomes tender. Strain through jelly cloth. Boil liquid 20 minutes. Add equal amount of sugar. Boil briskly for 10 minutes. (*Journal of the Dept. of Agri. S. Australia—May 1937.*)

**Hybrid Vigour in Plants.** Increased vigour over either parent of the product of the cross between two inbred lines has been frequently reported in plant breeding and, through vegetative propagation, efforts have been made, especially with trees, to make practical use of the phenomenon. It is usually explained, in Mendelian terminology, as the result of association of several genes for size which had been isolated in either parent, and subsequent loss of vigour in succeeding generations is attributed to segregation. There has been little analysis, however, of the factors contributing to the heterosis or hybrid vigour during the development of the hybrid, so that considerable interest is attached to recent series of papers by Dr. Eric Ashby which have brought to light some most unexpected features of this process in specific cases.

In certain strains of maize and in two cases with tomato strains where the hybrid showed greater weight and dry weight, greater height, more leaves and larger leaf area than either parent, analysis of these differences showed no appreciable difference between hybrid and parent in relative rates of growth or



of dry weight increase, of rates of production of leaves and new leaf area or of photosynthetic efficiency. Cell size in hybrid and parent also seemed approximately the same, but the embryo of the resting seed seemed larger in all cases.

The only possible conclusion from these results would seem to be that the organization of the growing shoot of the hybrid is upon a larger scale. Embryo and shoot apex form cells more rapidly, but this does not result in a quicker release of leaf primordia from the shoot apex because the whole plan of shoot organization, though still that characteristic of the species, is built upon a larger scale. More cells must accumulate at the apex before the new leaf primordium must separate. Naturally, therefore, when it arises, this primordium is planned on a larger scale from the outset, presumably its procambial and vascular strands are commensurately larger and it grows into a larger leaf, though individual cells in their metabolic and photosynthetic efficiency, correspond with those of the parent forms.

Dr. Ashby speaks of larger primordia in the seed but the term is usually applied to leaf primordia, and in the embryo of the tomato, apart from cotyledons, leaf primordia will scarcely be manifest yet. It would seem that the comparison is rather upon the scale of organization of the meristematic aggregate in the hybrid shoot; planned on a more generous scale, it yet maintains the rate of leaf development of the parent, so that its growth must mean a larger number of meristematic cells maintained in full activity at any moment, therefore more cell divisions and the growth organization of the species maintained at its usual *tempo* but on a larger scale.

Dr. Ashby's studies are therefore full of significance in relation to the problem of shoot organization in the higher plant, as well as in connexion with the genetic explanation of hybrid vigour. Dr. Ashby points out that his results are not in accordance with the usual interpretation given to the linkage of genes in the  $F_1$  generation, but there is as yet so little information as to the way in which the gene is geared into the machinery of development that it is early to say whether the conventional explanation in terms of genes can be applied to the machinery now revealed as operating in the development of the hybrid. (*Nature*—May 15, 1937.)

## Agricultural Jottings.

(The Department of Agriculture, Madras).

**Why a Pest Act is necessary for Cambodia Cotton.** Cambodia, karunganni and uppam cottons were sown side by side on the Cotton Breeding Station during the year for certain experimental studies. They were picked separately every week. When their weekly pickings were sorted into good and insect damaged kapas, it was found that Cambodia kapas contained 50% more of damaged sort than karunganni and uppam. These have indicated that though karunganni, uppam and Cambodia are sown together, it is the Cambodia variety that suffers most from pests and that the enforcement of the cotton pest act is especially necessary for this variety.

**The place of money-crops in the Tanjore Delta.** Over a million acres of land are devoted to cultivation of paddy annually in Tanjore District without rotating it with any other crop. Of this area, about  $1\frac{1}{2}$  to 2 lakhs of acres are cropped with paddy twice a year while the rest of the area is devoted to a single crop. When prices were ruling high at Rs. 2-8-0 to Rs. 3-0-0 per kalam of 64 lb. there was a decent margin of profit kept for the mirasadars even from a low average yield of 30 kalams per acre. But with the fall in price of paddy ranging from 40 to 60 per cent from 1930 onwards the margin of profit has become very narrow.