

rather than clean them. Another method of minimising the harm done by insects is to make the trees more resistant to insect-attacks. This immunity can be obtained by starting from immune breeds, to determine which the difference in susceptibility already shown by the marketed fruits may be taken into advantage. But standing crops will gain much in the matter of immunity if proper food supply is given and a general clearing up of the orchard maintained.

A very interesting control of insect-pests, little of which is known and still less used in India, is their *biological control*. This method of control has been tried on a large scale in the West and has been found signally successful. Biological control takes advantage of the fact that certain insects prey upon other insects in one stage or another of their life-history and has succeeded in so breeding, introducing and naturalising one or more species of parasites of an insect-pest in the region where the latter thrives that the parasitic species have completely subjugated the pest in that region. Special breeding stations are formed from where millions of parasites are distri-

buted to the various fruit-growers who release them in their orchards. Needless to say that specialists must first be employed to discover the parasites which attack a definite species of pest. All this is done in the West by forming an association of fruit-growers and maintaining an efficient staff of specialists at their own cost. A similar move in India will not be less paying than it has been in countries where this has been tried and not found wanting. It may be pointed out here that in the artificial control of insect-pests one should be careful not to destroy friend and foe together, for then the epidemics may be more virulent than when the things were left to nature.

It is expected that Indian fruit-growers will take full advantage of methods that have been tried over and over again for the suppression of insect-pests of orchard crops and which, with its little necessary expenditure, will increase the annual output of an orchard by 25%. When all is said one may remind the fruit-grower that as with the human body so with the best cultivated orchard, a 'doctor' is always required to keep it in a condition of maximum efficiency.

Letters to the Editor.

A Note on the Embryo Sac of *Sagittaria sagittifolia* L.

IN a recent paper Prof. K. V. O. Dahlgren¹ has described the development of the female gametophyte in *Sagittaria sagittifolia* and finds it to have a six-nucleate embryo sac arising in the same way as described for some other *Alismaceae* in his earlier paper². My material collected from Lucknow in February 1934 shows some variations in the number of nuclei in the mature embryo sac.

Upto the four-nucleate stage the embryo sac develops in the same way as described by Prof. Dahlgren. Usually the two chalazal nuclei do not divide further and the mature embryo sac is six-nucleate, but

sometimes, one or both of them may divide producing a seven and eight-nucleate embryo sac respectively. Sometimes, the lowest chalazal nucleus of the tetra-nucleate stage may undergo fragmentation and thus increase the number of the antipodal nuclei. The results obtained by me in *Sagittaria sagittifolia* agree with my previous observations on *S. guayanensis*.³

In his work on *S. latifolia* Schaffner⁴ mentioned the presence of three antipodal cells. Cook⁵ on the other hand says that there are three ephemeral antipodals in *S. lancifolia*. Dahlgren¹ criticises both of them and definitely states that there are no antipodal cells in *Sagittaria*.

¹ Dahlgren, K. V. O., "Die embryosackentwicklung von *Echinodorus macrophyllus* und *Sagittaria sagittifolia*," *Planta, Archiv für wissen., Botanik*, 1934, **21**, 602-612.

² Dahlgren, K. V. O., "Die embryologie einiger *Alismataceen*," *Svensk Bot. Tidskr.*, 1928, **22**, 1-17.

³ Johri, B. M., "A note on the life history of *Sagittaria guayanensis*, H. B. K." *Current Science*, 1934, **2**, 428-29.

⁴ Schaffner, J. H., "Contribution to the life history of *Sagittaria latifolia*," *Bot. Gaz.*, 1897, **23**, 252-273.

⁵ Cook, M. T., "The Embryology of *Sagittaria lancifolia* L." *Ohio Nat.*, 1907, **7**, 97-101.

