

of small spots along the centre of the wing-cover in the Lesser Migratory locust as compared with broad, dark blotches in the Pellucid locust. There are several other important but less-evident characters for separating the two species.

HABITS OF THE YOUNG OR HOPPERS.

The life of a hopper, as the young form is termed, commences when it emerges from an over-wintering egg-sac, in company with some twenty-five others. The time of its appearance is influenced by the nature of the season; an early spring is conducive to early hatching, while a late one produces a contrary effect. Generally speaking, however, we may expect the first hoppers to appear during the early part of May, and they will probably be sufficiently numerous to be a menace to the crops by the end of the month. The young hoppers are voracious feeders and, if food is not available in sufficient quantity where they have hatched, they quickly make their way to new feeding-grounds. With abundant food they develop quickly and, as they grow, cast off their skins from time to time, passing through five moults in all. After the last moult they are fully developed and have wings. The life of a hopper, as thus summarized, takes about forty-five days to complete. During this time its chief habits appear to be those of feeding and of sunning itself. In the early morning or on cool days, the hoppers may be observed in large masses indulging in the latter habit, while during the heat of the day their appetite appears to be unlimited. When still very young the hoppers generally seek some sort of shelter during the night. Here they will remain during the daytime if the weather be cold or wet. Grass lands such as road-sides, patches of broad-leaved weeds, or rough grain-fields all afford the desired protection, while fields with a smooth surface are always avoided. The fact that hoppers remain over-night where the land is rough or weedy accounts largely for the irregular outline at the margin of a field they are attacking, for the reason that they naturally congregate where they can secure shelter, and from such points make farther inroads into the growing crop next day.

HABITS OF THE ADULTS.

On attaining the winged state, the habits of locusts undergo a change. True, they are still voracious feeders but, in addition to this familiar habit, they have other habits such as those of flying and egg-laying. By the end of June flights are of general occurrence, and extensive migrations may be observed on every warm sunny day. It is under such climatic conditions that the insects rise in large numbers and drift along in such enormous swarms as to resemble a heavy snow-storm. These swarms may extend but a short distance or they may cover many miles, this depending largely on the governing weather factors. Warmth, sunshine, and a moderately strong breeze are the most favourable for long flights. In fact, the insects may be said to rise in sunshine and to drop in shadow, since a single cloud obscuring the sun is sufficient to bring them to earth. It is owing to these flights that many fields previously free, become infested, while others already attacked may be saved by the insects moving elsewhere. For this reason, too, various isolated areas often become centres for future infestation. These migrations continue intermittently for at least a month, but become less frequent during the egg-laying period. The Lesser Migratory locust flies at a much higher altitude than the Pellucid locust; the migratory flights of the former species may reach an altitude of several hundred feet, as we have learned by observation and by the report of an aviator at Carlyle, Sask.