GRYLLOTALPA GRYLLOTALPA LINN., THE EUROPEAN MOLE CRICKET IN NEW JERSEY

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During the early part of July, 1915, my attention was called to an underground insect which was cutting off the roots of various plants in a nursery at Rutherford, N. J. Upon making a search, a mole cricket considerably larger than our common but by no means abundant *Gryllotalpa borealis* Burm., was found to be responsible for the injury. Mr. J. A. G. Rehn, to whom a specimen was submitted, pronounced it *Gryllotalpa gryllotalpa* Linn., the European mole cricket. The infestation which is undoubtedly of several years' duration, extends over several acres planted to herbaceous and ornamental stock, a considerable portion of which is used for show purposes only. The soil is rather light and porous and contains a variety of shrubs, shade trees, evergreens, etc., such as one would naturally find in a nursery. No preference was shown by the cricket for any particular plant, its zig-zag burrows being found in different parts of the area irrespective of the kinds of plants growing there.

The insects were numerous enough for the nursery to detail several men to hunt them out and destroy as many as possible every few days and to sink empty flower pots in the ground, covering them with boards, for trapping purposes.

Malcolm Burr in his "Synopsis of the Orthoptera of Western Europe" records this species as occurring through Europe, and from Sweden to Spain, rare and local in England, abundant in France, often doing damage to gardens, common in Belgium. At Rutherford, where the insect was discovered, large amounts of imported stock are received every year. There were consigned to this locality during 1914, more than five thousand parcels of imported stock and during the spring of 1915, over two thousand parcels were received. The majority of this stock comes from Belgium and Holland and only a small

portion from France. Inasmuch as it is chiefly Holland and Belgian stock which comes over with soil around the roots and inasmuch as a porton of this is always planted temporarily in the now infested area, it is almost certain that the insect came from one or both of these countries.

E. Bourcart in "Insecticides, Fungicides and Weedkillers" gives a short account of this species in which he states that it lives almost entirely on insects and their larvæ, cutting all roots that hinder it in its search for this food. The winter is passed at various depths, depending upon the temperature and amount of moisture present. In the spring it ascends and excavates numerous runs within a few centimetres of the surface. Bourcart further states that it takes twelve years for the number of these insects to increase so far as to render culture impossible. The existence of each insect is three years, each female depositing two hundred eggs, but multiplication is comparatively slow.

Other European writers state that the food of the mole cricket consists largely of vegetable matter but all agree in that it is cannibalistic at times. According to Bastin, eggs are laid in a specially constructed chamber, the adult caring for them and feeding the young until their first moult, when the family disperses.

Coming to remedies, Bourcart mentions the use of poisoned pastes, of maize, starch, water and phosphorus, being placed in the burrows and the openings closed. In Italy, liming at the rate of 16 cwt. to the acre is supposed to remove the crickets. Petroleum or a 25 per cent emulsion of petroleum poured into the burrows has also been used in Europe. Ratzeburg, in 1847, advised the injection of oil into the tunnels and afterward sprinkling the surface with water. Bourcart also mentions the use of naphthaline in the ground as it is being tilled and also raking the soil until the surface is clean, then beating it and adding water if necessary. During the night the mole crickets dig new tunnels which are seen the next morning. These are opened with the fingers and tepid soapy water poured in.

Worsham and Reed, in Bull. 101 of the Georgia Experiment Station on *Scapteriscus didactylus* Latr., advocate for that species the ploughing of breeding areas to destroy the eggs by exposing them to the sun, etc., light traps at certain seasons, compost heap traps during the winter, poisoned baits made of cottonseed meal and arsenicals, sulphur and naphthaline as repellants and the banding of individual plants by means of tin, paper or wire cylinders.

The presence of the European mole cricket in New Jersey is simply an example of how impossible it is to keep out all foreign pests by a close inspection of foreign stock. No matter how careful the inspector is, something is bound to get by and cause trouble later on.