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GRASSHOPPERS IN IOWA IN 1936[1]

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Iowa and other mid-western states suffered tremendous grasshopper losses in 1936. Although the heaviest damage occurred in the western and southern counties, the infestation extended across the southern half of the state and up along the Mississippi River into a number of northeastern counties. In fact, more or less damage occurred in all save about 25 counties located in the north-central part of the state. Over 21,000 farmers broadcast 200 or more pounds of poison bait on their respective farms, and a total of 4,463 tons of dry bait materials were wet and mixed at 52 county mixing stations.

Four species of grasshoppers, namely, *Melanoplus bivittatus* (Say), *M. differentialis* (Thomas), *M. mexicanus mexicanus* (Sauss.) and *M. femur-rubrum femur-rubrum* (DeGeer) far outnumbered all other species and were responsible for over 90 per cent of the total damage to the cultivated crops. The relative abundance of these species varied greatly in different sections of the state. *M. mexicanus* was very abundant in western Iowa and present in moderate numbers in southern and eastern counties. This distribution was reversed in the case of *femur-rubrum* which was decidedly the dominant species in the east, abundant in the south and less important in the west. *Bivittatus* was abundant in the west but, except for local areas in a few south-central counties, it did not appear in destructive numbers elsewhere in the state. *M. differentialis* was present in all parts of the state but was most abundant in the west-central, southwest and south-central counties.

The eggs of *M. mexicanus* and *M. bivittatus* began hatching the latter half of April and by the last week in May the adults began to appear in rather large numbers. The eggs of *M. differentialis* and *M. femur-rubrum*, however, did not hatch in numbers until after the first of June. In areas where *M. mexicanus* and *M. bivittatus* were most abundant, farmers began spreading poisoned bran-sawdust bait about the middle of May, but where these two species were not present very little baiting was necessary before the first

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of June. When all four species were present in large numbers in the same community it was often necessary to make repeated applications of bait from about May 15 until after August 1.

Crop damage by grasshoppers, distinct from drouth injury, ran into the millions of dollars, and all crops except certain sorghums were severely attacked. In 24 southwestern counties from 50 to 100 per cent of the crop land was heavily infested, and by fall much of the corn in this area was completely stripped. Only those farmers who effectively poisoned their 'hoppers harvested more than one cutting of alfalfa. The yield of red clover was also materially reduced and in most cases the clover plants were killed within a week or two after the field was mowed. Hundreds of fields of sweet clover which made excellent growth and would have yielded a good hay or seed crop were completely destroyed. With the exception of a little winter wheat and some spring wheat in Woodbury, Plymouth, and nearby counties, wheat and rye for the most part matured early and escaped serious grasshopper damage. Oats, barley, and flax, however, suffered heavily and many oat fields were cut for hay or pastured. Soy bean fields with defoliated border strips varying from a few feet to several rods wide were not uncommon; in a few cases whole fields were destroyed.

In addition to the extensive damage inflicted upon field crops the grasshoppers destroyed many farm gardens and invaded some of the larger fields of truck crops. The melon and sweet potato growers in Muscatine County used over 30 tons of bait to protect their truck crops. Farm orchards and small fruit plantings were also heavily damaged, and in many cases complete defoliation and barking of tender shoots and twigs resulted in permanent damage. In addition to the 24 heavily infested counties there were approximately 19 counties in which from 25 to 50 per cent of the crops were damaged and 23 counties in which light to moderate damage occurred. Within most of the 42 counties just mentioned there were many local areas where the infestation was extremely heavy and where serious damage occurred.

Grass pastures and hay lands were extensively damaged partly by the predominating species already mentioned and to a considerable extent by a number of other species which might be regarded as belonging to the old prairie grasslands or the western plains. *Ageneotettix deorum deorum* (Scudder) which has shown a constant rise in numbers since 1934 far outnumbered the other

prairie species. In many bluegrass pasture fields it was the dominant species and populations averaging over 50 per square-yard were not uncommon (Fig. 1). *Orphulella speciosa* (Scudder), a species frequently associated with *Ageneotettix*, was quite abundant in many sections of the state. In the western counties a closely

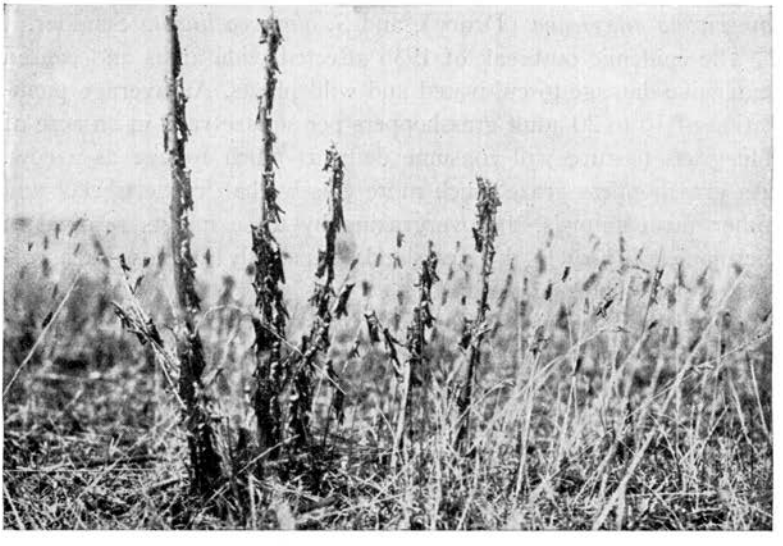

Fig. 1. Ageneotettix and allied species climbing plants to avoid the hot ground (temp. 110° F. in shade).

related species, *O. pelidna* (Burm.), was taken in bluegrass pastures and native prairie grasses near woodlands. Similarly, *Trachyrhachis kiowa kiowa* Thomas and *Arphia pseudonietona* (Thomas) which were more or less common on prairie sod lands and overgrazed pastures in the western counties were replaced by *T. kiowa fuscifrons* (Stal) and *A. xanthoptera* (Burm.) in the south central and eastern counties. Such species as *Melanoplus packardii* (Scudder), *M. keeleri luridus* (Dodge), *Dichromorpha viridis* (Scudder), *M. confusus* Scudder, *M. angustipennis* (Dodge), *Spharagemon collare* (Scudder), *Phlibostrima quadrimaculatum* (Thomas), *Encoptolophus sordidus sordidus* (Burm.), *Hippiscus rugosa* (Scudder), *Xanthippus haldemanii* (Scudder), and *Phoetaliotes nebrascensis* (Thomas) were frequently collected in permanent pastures but seldom in very large numbers. Individually these species were of little importance but collectively they contributed considerably to the total damage. In low land pastures and near marshes, *Melanoplus foedus fluviatilis* Brunner, *M. borealis*

junius (Dodge), and *Chorthippus longicornis* (Latreille) were often present in moderate numbers.

The roadside grasshopper, *Dissosteira carolina* (Linn.), although more than usually abundant and present in practically every field, occurred in large numbers only along roadsides and in uncropped weedy fields. This observation might also be made for *Schistocerca americana americana* (Drury), and *S. alutacea lineata* Scudder.

The epidemic outbreak of 1936 affected wide areas and caused extensive damage to cultivated and wild plants. An average population of 15 to 20 adult grasshoppers per square yard in an acre of bluegrass pasture will consume daily as much foliage as a cow. As grasshoppers graze much more closely than cattle, sheep, and other farm animals, the overgrazing by these insects resulted in permanent injury to the grasslands, especially in those areas affected by subnormal rainfall.

In the most heavily infested counties in western and southern Iowa the grasshoppers destroyed a large percentage of the grasses, weeds, and other herbaceous plants used by quail, pheasants, and other permanent resident birds for winter cover and food. The cottontail, fox squirrel, oppossum, raccoon, and other game and furbearing animals also suffered because of the heavy reduction of suitable cover and food. The widespread destruction of grasses, shrubs, and other vegetation rank grasshoppers among the most important enemies of wildlife conservation and soil improvement programs.

The egg survey made in the fall of 1936 revealed that the grasshoppers which survived the drouth and poisoning campaign made generous provision for posterity. With more grasshopper eggs in the soil than at any other time during the present century Iowa approaches the spring of 1937 with considerable apprehension.

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