THE 1940 GRASSHOPPER OUTBREAK IN SOUTHWESTERN SASKATCHEWAN

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By 1939, the decade of drouth, dust storms and grasshoppers was approaching an end in Saskatchewan. During this period most of the grasshopper problem was attributed to local population increases of two species, the migratory grasshopper, *Melanoplus sanquinipes* (Fab.) and the clear-winged grasshopper *Camnula pellucida* (Scud.). However, Saskatchewan grasshoppers had periodically been reinforced by immigrations of the migratory grasshopper, long known to us by the nick-name "mex", derived from the former name, *M. mexicanus* (Sauss.). Poison bait was an important element in the overall grasshopper control strategy and record quantities of it were applied that year. The bulk carrier in this material was sawdust, enriched with a little low-grade wheat flour, and poisoned with sodium arsenite, a rather nasty, caustic hazardous poison.

Early in July of 1939, my first summer with the old Dominion Entomological Laboratory, inward flights of the migratory grasshopper began on a broad front, but, for the most part, nothing serious had followed in terms of egg deposits. However the area south of the Cypress Hills and west of the Frenchman River proved exceptional. H. A. McMahon from our Laboratory made an egg survey there after the adult grasshoppers had long gone, and found stubble fields impregnated with an unusually large number of eggs, about 90 per sq. ft. The area later appeared on the forecast map in red, to represent the highest category, "Very Severe". But even that turned out to be an understatement. In this area, only 15 to 20 per cent of the land was under cultivation, the rest being rangeland. Since the migratory grasshopper generally avoided laying eggs in rangeland and fallow, the result was a concentration factor of 5 or 6 in the stubble. Because the eggs had been deposited early, most had probably reached maximum embryonic development before winter arrived, setting the stage for maximum impact the following year.

The spring of 1940 began favourably in the southwest. Soil moisture was unusually plentiful and prospects for a crop were good. Growers sought to make the most of this by sowing new crops on last year's stubble, a practice long recognized by entomologists as a poor policy when grasshoppers threatened. Good moisture supplies tend to mitigate the destructive potential of a grasshopper infestation, but because this was a case of super saturation in stubble the usual principles didn't apply. Grasshopper hatching was about in phase with the development of the young crop. The hatchlings boiled up out of the soil and easily devoured whatever was at hand. Larger now, they moved quickly to attack crops becoming established in fields fallowed in 1939. Having devoured them, the still unfledged nymphs in some cases marched deeply into the grassland.

In one field Dr. R. H. Handford, then of our laboratory at Brandon, and I watched the late Mr. S. H. Vigor, Field Crops Commissioner for the Saskatchewan Department of Agriculture, approach us. He was

Adult migratory grasshopper (left) and clearwinged (right).
Agriculture Canada, Saskatoon

trudging across the field in his breeches and high boots — we all wore the bring'em-back-alive uniform in those days — exclaiming "It's hopeless, simply hopeless".

The growers in this area had been left out of the mainstream of grasshopper outbreaks in the immediately preceding years, and remained a little complacent about preparations such as provision of bait spreaders. But now they reacted with their usual ingenuity to improvise machines and began to fight back with all they had. Local and provincial officials had also taken a somewhat relaxed attitude toward the forecast and had been conservative in laying in sawdust supplies beforehand.

The stocks now began to disappear at an alarming rate, and it soon became evident that the visible supply would fall far short of demand. Officials responded quickly; there was plenty of sawdust at sawmills in the north, but it was now the wrong time of year to move it to railheads. There was surplus sawdust at other points in the farming area, but one doesn't move hundreds of carloads of sawdust by rail overnight. For a time the farmers were short of ammunition. Then supplies of bait began to flow again and many growers continued the struggle with amazing tenacity. A little more than 600 carloads of sawdust were supplied in Saskatchewan that year, and at

Vehicles waiting to pick up grasshopper bait at Eastend, Saskatchewan, 1940.
L. G. Putnam

least 2/3 of this probably went to the Eastend Area. It is doubtful that the district produced that much threshed grain.

In the end, only a minority of the crop was salvaged. A small amount of this could be found in the southern and most seriously affected part of the area, and somewhat more in the northerly portions immediately south of the Cypress Hills. Later that year, observers noted that much of the arable land looked as though it had been kept clean by tillage, as for fallow. The surviving grasshoppers had fled, failing to find a living. East of the Frenchman River, the crops were only slightly damaged, and provided a tantalizing view of what might have been. The grasslands were less seriously damaged, leaving people who owned cattle in a better position than those who grew only grain. The value of crops lost to grasshoppers in this area was estimated at 3.8 million dollars, plus a control campaign of $50,000.

This outbreak was unequalled before or since in its intensity, in Saskatchewan. Perhaps the best efforts we could have made would have been inadequate under these circumstances, with the relatively clumsy techniques of those days. The failure on the part of nearly everyone, from the growers on up, to anticipate and prepare for catastrophe, gave one long thoughts about human nature and insect outbreaks. The problems imposed by the inadequacy of immediate responses to emergent pest situations, as opposed to more adequate long-term ones, arise from farmers, officials and politicians, and are still with us.

Entomologists need a little shaking up from time to time, too. The fecundity potential of insects seldom finds full expression, but when it does, it is awesome. There is no substitute for a personal involvement in an outbreak, the end result of such released potential. The grasshopper outbreak of 1940 of the "Eastend area" of Saskatchewan

was one of the most vivid experiences of this kind.

P. W. Riegert has assembled the historical data on grasshopper abundance in Saskatchewan, up to 1966.[2] Most readers will probably be unaware of the methodology of grasshopper surveys and forecasts. Most of the literature on this is not generally available, but Dr. Riegert's work includes a good treatment of this subject.

[1]PARKER, J. R., R. C. NEWTON and R. L. SHOTWELL. 1955. *Observations on mass flights and other activities of the migratory grasshopper.* USDA Tech. Bull. 1109.

[2]RIEGERT, P. W. 1968. *A history of grasshopper abundance surveys and forecasts of outbreaks in Saskatchewan.* Memoirs of the Ent. Soc. of Canada, No. 52.

[3]VIGOR, S. H. 1941. *History of organized grasshopper campaigns in Saskatchewan from 1919 to 1940.* (Unpublished typescript.)

MOVEMENT OF SPRING PEEPERS

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On the night of August 1, 1975, while returning to town from Lake Atikameg by car, hundreds of spring peepers (*Pseudacris negrita septentrionalis)* were seen in the car headlights crossing the asphalt highway. A section of the highway about 100 meters long was covered by hundreds of the small frogs — all one species. They were coming out of the west ditch of the highway and moving in only one direction — east. Many were crushed by the passing traffic. Only three specimens were collected; they are preserved in writer's collection; one is crushed as taken from the highway.

Migrations of amphibians occur from time to time, both as young and adults, but are not often recorded in the literature.

This species is a sphagnum bog, pothole species. It may have increased in numbers locally or it may breed in extensive man-made ditches. This migration may have been occasioned by an explosion in local populations due to better living conditions in the shallow, warm ditches which are rich in aquatic insects of many species — notably Trichoptera. The frogs may also have been looking for a suitable hibernating site.

THOUSANDS OF AFRICAN CLAWED FROGS have been discovered in San Diego County's Sweetwater Reservoir and in drainage ditches in Orange County, California, according to the U.S. Fish and Wildlife Service. The agency has proposed regulations to control the importation of wildlife. The imported species sometimes breed rapidly in their new environments and threaten people, natural resources and native wildlife.

The African frog was originally brought into the U.S. for use as a pregancy test for humans, but has been replaced by more sophisticated methods. However, it has become established in Southern California where excess supplies were released or sold to pet stores. The frog first showed up in the reservoir in 1971, and it may have been responsible for the decline in the local population of tree frogs. It is feared that the African variety may migrate to the Colorado River waterway where it could cause much more damage.

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