

HIBERNATING BUMBLE BEES AT THE PAS, MANITOBA

WALTER KRIVDA, Box 864, The Pas, Manitoba. R9A 1K8

It is well known that bumble bees hibernate. The fertilized queens in the fall of the year find suitable refuge for the winter. Here they freeze almost solid. In this condition they pass the winter. In the spring as the ambient temperature rises, they revive, leave their hiding places and start to feed on the pollen and nectar on the first pussy willow blossoms. This is likely their first food. Soon after, they start new broods. This part of the life history is rather well known.

It is somewhat of a puzzle however, just where bumble bees pass the winter. The nests of mice are often suggested as a likely place; old sawdust piles are also listed as likely spots. Hibernating directly in the ground is not mentioned. In northern areas and beyond tree line, the soil is the only available location. Here in the wilder habitats, hummocky, peaty soil is likely favoured.

It is not known evidently that solitary bumble bees overwinter in gardens in the ground.

Over the past 30 years and more, I have noted that bumble bees are found in potato hills in September when the potatoes are dug. I have collected such specimens and preserved them in my insect collections.

When the hill is disturbed as the potatoes are dug, the bees often fall on their backs. In bright sunny weather, they will buzz loudly, soon after being dug out of the loose, friable soil. Some can even fly off. In dull, cold autumn weather they stay torpid and dormant and can be carried in the hand.

This year, on 10 September, I had the great good fortune to observe a queen bumblebee flying among potato hills in the garden looking for a likely hiber-

nating location. After a few minutes of explorations, she landed, walked up a potato hill and entered the top of the hill just where the potato vines emerged from the ground. She began pushing into the soft soil head first and using the first pair of legs to help her along. In less than a minute she was out of sight. The soil continued to heave briefly as she dug. Soon this stopped as she penetrated more deeply. The following day I dug her out. She had penetrated three inches into the soil. Over the next eight days as 700 hills of potatoes were dug, seven queen bees were found. Three have been preserved as specimens and labelled as being found in potato hills. The other four were set free. All were of one species the Common Black and Yellow Bumblebee. Hibernation in soil is hereby established. This may help explain why other, black species of *Bombus* can survive on the Islands of the high arctic where the only place to hibernate is the soil. This is the ecological winter niche of bumblebees.

It should be noted that 1% of the potato hills had hibernating bees. A farmer's field of thousands of hills can accommodate the future mothers of entire bumblebee populations.

It is early enough in the year for the disturbed queens to find new winter quarters after having been driven out by potato diggers. A late cold and wet season may kill many exposed queens. This needs more observation.

The habit of bumblebee queens attempting to hibernate in potato hills may adversely affect bumblebee populations in areas devoted to potato farming. This may have an indirect effect on seed set of wild plants locally and also on plants such as field peas, needing bee pollination.