

Nosema Apis Recognised as the Cause of Spring Dwindling In Bee Colonies

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THE symptoms of so-called "spring dwindling"—a rapid loss of field bees in the spring, when hives should be gaining strength—are familiar to most commercial beekeepers. Hives usually recover, but occasionally die out. Examination of such hives shows apparently normal bees and brood and adequate honey and pollen. The main cause of the trouble is *Nosema apis*, a protozoan parasite which invades the bees' stomachs. This parasite has been recognised for the first time as a cause of spring dwindling in New Zealand.

DURING the spring of 1946 adult bees from cases of spring dwindling were examined at the Animal Research Station, Wallaceville. Samples were received from Hawke's Bay, Central Otago, and Auckland areas, and the laboratory apiary was included in the survey.

In all definite cases of spring dwindling investigated the hive was found to be infected with *Nosema apis*, a parasite of which reports had not been published previously in New Zealand.

Nosema apis is a parasitic, spore-forming member of the protozoa—

microscopic, single-celled animals. *Nosema* spores are more or less oval, about 2-10,000in. long and half as wide.

When spores reach the stomach of a bee they shed their coats and liberate the parasites, which enter the cells lining the stomach. There they grow and multiply rapidly, and finally produce numerous spores, which pass through the bee and can infect a fresh host.

Field bees become weakened by the enormous number of parasites in their stomachs and are unable to return to the hives when out foraging. In a badly-diseased hive all the adult bees

may show some degree of infection. Queens are attacked, but brood is immune. The disease reaches its height in the spring, though it may persist throughout the year.

Symptoms of Infection

A loss in strength without apparent cause is usually the first sign of infection, other symptoms being difficult to detect. Microscopic examination is the only means of accurate diagnosis. If *Nosema* is suspected, a queen cage of live field bees should be despatched through the local apiary instructor to the Animal Research Station, Wallaceville, for examination.

It has been shown in America that combs and equipment from infected colonies do not spread the disease. Isolation of infected colonies is not recommended in any country where *Nosema* occurs, as the disease is not considered serious enough to warrant such action. Contamination of drinking water and the robbing of diseased hives probably cause the spread of *Nosema*.

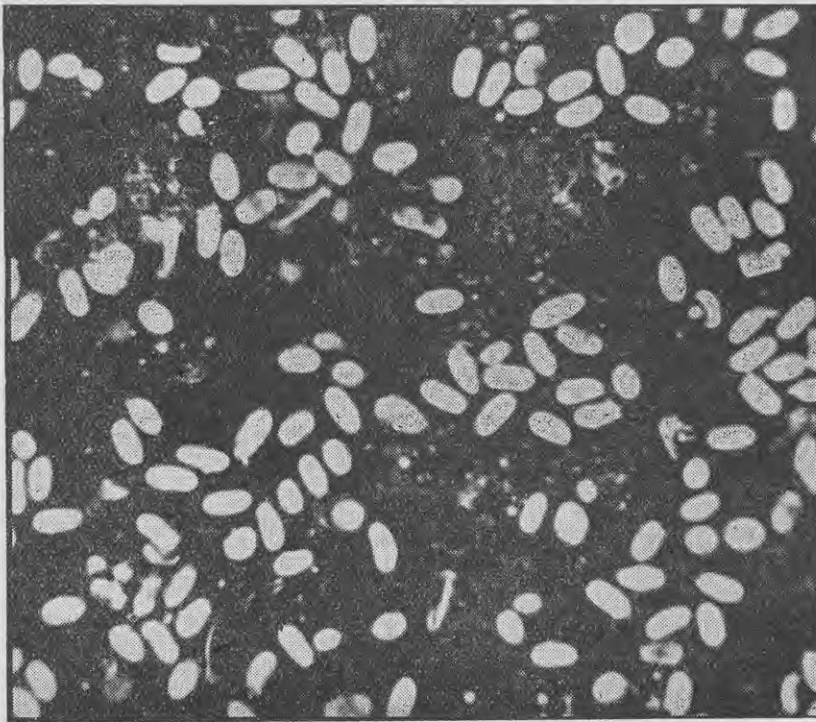
No Cure Yet Known

Many drugs have been fed in syrup to bees in an attempt to cure *Nosema*, unfortunately without effect. Methods of treatment are being investigated at Wallaceville. If an infected colony loses its queen or is rapidly losing strength, building up with a nucleus is of value.

Nosema has been reported from Australia, Brazil, Canada, England, Germany, Switzerland, and the United States of America. Its presence in New Zealand is not surprising, as it was first reported in Australia as early as 1910. It is possible that *Nosema* was introduced in the early days of beekeeping, as it is probably the commonest and most widely distributed of bee diseases.

Nosema is a far less serious disease than American foul brood. Strong colonies with a mild infection soon throw it off and recover, as was the case at Wallaceville in some of the strongest colonies. A weak colony with a heavy infection may die out, and occasionally a group of hives, perhaps with lowered resistance, becomes a total loss. The economic loss to the beekeeping industry as a whole is probably small.

There is little doubt from past accounts of spring dwindling in New Zealand that *Nosema* has been present for many years. Its recognition as a cause of spring dwindling does not suddenly bring to light a new disease, but indicates the cause of an old one. Methods of treatment can now be tried and checked.



Spores of *Nosema apis* magnified about 750 times.