

VERMONT DEPARTMENT OF AGRICULTURE, FOOD & MARKETS
PLANT INDUSTRY DIVISION

EUROPEAN FOULBROOD DISEASE

CAUSE

Mellisococcus pluton, a microscopic lancet-shaped bacteria.

EFFECT

European foulbrood (EFB) is most common in the spring when brood rearing is at its height, though usually the earliest reared brood is not affected. Sometimes the disease appears suddenly and spreads rapidly within infected colonies; at other times it spreads slowly and does little damage. EFB may severely weaken a colony but usually does not kill the entire colony. As a rule, it subsides by mid-summer, but occasionally it continues to be active during summer and fall or may re-appear in the fall. A good honey flow seems to hasten recovery.

SYMPTOMS

Larvae diseased by EFB move abnormally within their cells and therefore, when they die, are usually twisted in the cells. However, some larvae may be stretched out lengthwise from the top to the base. The larva collapses as though it had been melted, turns yellowish brown, and eventually dries to form a loosely attached brown scale. The consistency of recently dead larvae varies, but it is not ropy. The odor of the larval remains also varies, but it is usually a sour odor. The scales are loose within the cells and can be removed easily. Combs containing larvae infected with EFB usually present a rather spotty appearance because the infected brood cells, which are not usually sealed, are interspersed with healthy brood cells.

TRANSMISSION

The organism becomes mixed with the brood food fed to the young larva by the nurse bees, multiplies rapidly within the gut of the larva, and causes death within about 4 days after egg hatch.

House bees cleaning out the dead larvae from the cells distribute the organism throughout the hive. Since the honey of infected colonies and the beekeeper's equipment are often contaminated, subsequent spread of the disease is caused by exposure of contaminated honey to robber bees, interchange of equipment, especially combs, between colonies by the beekeeper, and possibly by drifting bees. This bacteria is not a spore forming species.

TREATMENT/CONTROL

Requeening of badly infected colonies usually will help clear up the disease. Moving colonies to areas where there is a better honey flow or mix of flowering plants also usually decreases disease symptoms. Oxytetracycline, known commercially as Terramycin, or TM, is the only antibiotic approved for use against EFB in the United States. Treatment must be done early in the spring,

and completed 45 days before honey flows begin. If TM is used during the honey flow, the honey must not be used for human consumption. A fall treatment can be done, after honey harvest. Terramycin is best used as a dust, mixed with powdered sugar. TM loses activity quite rapidly when in a solution, especially when exposed to high temperatures and/or sun. The recommended formula is sold as "Terramycin Soluble Powder", and sold in a 6.4 ounce package. You can get this material from most bee equipment suppliers, and some farm stores. Pre-mixed formulations are also available from several bee supply companies; follow instructions on the label.

Caution: Terramycin is a powerful anti-biotic, affecting humans as well as bees. Avoid breathing dust when mixing, and wear latex or rubber gloves to avoid exposure to skin surfaces.

Mix: One level teaspoon of TM with 2 level tablespoons of powdered sugar, (1 dose for 1 colony); or one 6.4 ounce packet of TM with 2 lbs, 12 oz. of powdered sugar, (1 dose for 50 colonies). One good way to mix small quantities of TM and powdered sugar is to place the recommended amount of both into a container with a tight fitting lid and shake vigorously. Allow a few minutes for the mix to settle before opening, to avoid releasing dust.

Apply: Place 2 slightly rounded tablespoons of the dust on the tops of the frames in the brood nest around the edges of the brood area. Do not overdose or get the dust on open brood, as it will kill the larvae. Three applications at 4 to 5 day intervals are recommended. Reduce the dose for small colonies or nucs.

EFB is usually not a problem for Vermont beekeepers. Only a few cases have been found in recent years. However, EFB can easily be confused with the symptoms of Bee Parasitic Mite Syndrome. In colonies heavily infested with varroa mites, larva can often be found with very similar characteristics, namely off-colored, contorted in the bottoms of unsealed cells. When in doubt, contact the bee inspector for advice on diagnosis.

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The Vermont Department of Agriculture can help with many questions about bees and beekeeping. Contact: Steve Parise, Apiculturist, VT Dept. Of Agriculture, 116 State Street, Drawer 20, Montpelier, VT 05620-2901. E-mail: steve@agr.state.vt.us

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