

Matchstick Test

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Introduction

The matchstick test is a simple in-field test that can be used to positively diagnose American foulbrood (AFB) in colonies with an active infection. In this test, a small stick (e.g., matchstick) is used to draw out a decaying pre-pupa or pupa from under a sunken, darkened, or perforated capping. The resulting 'ropiness' of the brood indicates a positive AFB diagnosis. There are many reasons why brood may be discolored or deformed, but only those infected with AFB will rope out significantly (more than 2 cm).

Indications

A matchstick test is used when American foulbrood is suspected or any time a sunken capping is observed, indicating diseased/decaying brood underneath. It is good practice to perform a matchstick test any time a frame contains sunken or perforated capped cells.

Choosing the Right Cells

Choose brood cells that are or have been capped, where cappings appear dark in color, sunken, or perforated. The matchstick test can also be performed on open brood cells containing caramel-colored brood that appear melted (have lost all internal pressure) (Figure 1). The brood must contain enough moisture to allow stretching, so dried scales cannot be used.

SUPPLIES NEEDED

Matchstick or similar tool
(A small, stiff implement with a rough surface. Commonly used items include matchsticks, toothpicks, twigs, or coffee stirrers. The tool should be small enough to fit in a brood cell and rough enough to allow the infected brood to adhere to the surface.)

Brood frame exhibiting visible signs of AFB
(Specifically, a frame with sunken or perforated cappings)



Figure 1: Brood cells showing signs of AFB. Photo by Brandi Stanford, UF/IFAS Honey Bee Research and Extension Laboratory.

Checking Ropiness



Figure 2: Piercing a suspect capping with a wooden stick. Photo by Sarah Scott.

Using a matchstick (or other similar tool), pierce the capping of an appropriate cell (Figure 2).



Figure 3: A "rope" being drawn out of a brood cell. Photo by Sarah Scott.

Twist the stick in the brood and slowly pull it out of the cell. Observe if the decaying brood is viscous enough to be drawn out of the cell in a continuous strand ("rope") that is longer than 2 cm (Figure 3). The roping decayed brood will be shiny and will not contain lumps.

Common Errors to Avoid

Moving too vigorously or too quickly. The goal is to draw out the infected brood as far as possible. You do not need to stir vigorously or mix up the cell contents.

Testing only one cell. Test multiple cells in a hive or on a frame to confirm your result.

Choosing cells that are too dry. If the larvae or pre-pupae are long dead, they may be too dry to rope.



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