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Agricultural Extension Service
The University of Tennessee

Using Terramycin for the Prevention of American Foulbrood

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There are three formulations of terramycin (TM) registered for use on honey bees for prevention of American Foulbrood (AFB), a bacterial disease that can kill the colony. **None of these formulations may be used when honey is being produced for human consumption.** TM25 is a water soluble mixture that comes in a 6.4 oz. package and contains 25 grams of active ingredient (a.i.), oxytetracycline HCL, per pound. There are 10 grams (10,000 mg.) of a. i. in each 6.4 oz package. TM50D is not water soluble, comes in a 50 lb. bag. and contains 50 grams (50,000 mg.) of a. i. per pound. TM50D must be diluted with powdered sugar before it can be used in extender patties or as a dust treatment. A third formulation, TM100D, is rarely used by beekeepers and is not included in the following calculations. Terramycin can be applied to honey bee colonies using three methods: in extender patties, as a dust and in liquid feed.

Extender Patties

The recommended dosage for TM in extender patties is 800 mg. of a. i. per colony per treatment. Tables 1 and 2 provide measurements of TM, all-vegetable shortening and sugar, and the number of $^1/_4$-pound patties produced. The finished patties contain sugar (granulated and powdered) and shortening in the ratio of 3:1, sugar:shortening by weight. Mix the sugar and TM first to evenly distribute the TM, then add the shortening. One quarter cup of sugar weighs 1.7 ounces and $^1/_4$ cup of shortening weighs 1.75 ounces. One patty is applied per colony. The patty should be placed on the top bars of the frames of the uppermost hive body (Fig. 1).

Table 1.
Weights and volumes of ingredients to use when making extender patties using TM25.

TM25 only	Shortening	Granulated Sugar	No. Patties
4 teaspoons	0.9 oz.* ($^1/_8$ cup)	2.7 oz.* ($^2/_5$ cup)	1
1 6.4 oz. pkg.	11 oz.*($1^1/_2$ cups)	2 lbs. 1 oz.*($4\ ^3/_4$ cups)	12
3 6.4 oz. pkgs.	2 lbs. 1 oz.*($4^1/_2$ cups)	6 lbs. 3 oz.*($14\ ^1/_4$ cups)	36

* weight not volume

Table 2.
Weights of ingredients to use when making extender patties using TM50D.

TM50D + Powdered sugar	Shortening	Granulated Sugar	No. Patties
1 lb. 10 oz. + 6 lbs.	5 lbs. 10 oz.	11 lbs. 12 oz.	100
8 lbs. + 30 lbs.	29 lbs. 4 oz.	57 lbs. 12 oz.	500
16 lbs. + 60 lbs.	58 lbs. 8 oz.	115 lbs. 8 oz.	1000

Terramycin + powdered sugar dust

Both TM25 and TM50D can be combined with powdered sugar to make a dust which can be applied to honey bee colonies. As with extender patties, 800 mg of a. i. is applied per colony. **The mixture should be applied in 3 applications of 1 ounce each at 4- to 5-day intervals.** Therefore, the dust mixture should contain 800 mg of a. i. per 3 ounces of mixture or **267 mg of a. i. per ounce**.

For TM25: To produce dust containing approximately 267 mg of a. i. per ounce, **combine an entire 6.4 oz. packet with 2 lbs. powdered sugar to produce enough dust to treat 12 colonies (3 dustings of 1 oz. each)**.

For TM50D: To prepare the TM50D + powdered sugar dust (267 mg a. i. per ounce) **add 3 oz. of TM50D to 2 lbs. powdered sugar to produce enough dust to treat 11 colonies (3 dustings of 1 oz. each)**.

The dust can be applied to the top bars of the frames in any hive body; however, the best hive body to treat is the uppermost one that contains brood or the hive body just above the uppermost one that contains brood. Apply the dust to the outer edges of the frames to avoid dropping dust into the brood cluster (Fig. 2).

Terramycin in liquid feed

TM50D can be fed to honey bees by mixing it directly into a supplemental liquid feed for the bees, such as sugar syrup. See the product label for mixing instructions. Do not dilute TM50D with powdered sugar before adding to liquid feed. TM50D does not readily dissolve in a liquid. Also, the feed must be consumed within 10 days of application to ensure the TM is effective. **For these reasons we do not recommend feeding TM to a honey bee colony using this method.**

Extender patties vs. dust application: pros and cons

Patties are more laborious to produce, but can be stored for a long time in a freezer inside a plastic bag, sandwiched between layers of wax paper. Application requires only one trip to the apiary. The vegetable oil also provides some measure of control for tracheal mites; however, recent findings indicate that colonies containing extender patties are more attractive to adult small hive beetles, a new pest of honey bees, than colonies without patties. Previous patty recipes produced large patties that were often not entirely consumed, resulting in under-treatment. The 1/4-pound patty described here is smaller, contains more sugar and is more readily consumed by the bees. The dust mixture also can be stored for long periods of time, but requires three trips to the apiary with associated disturbance of the colony. Our experience has shown that dust applications are consumed soon after application, usually in less than four days after application.

Figure 1. Extender patty in wax paper. Slits are cut in paper to allow bees access to patty.

Figure 2. Honey bee colony treated with terramycin + powdered sugar dust.

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