CASE STUDY:

Use of Agribon floating row cover material to make banana bunch sleeves to prevent banana rust thrips infestations

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Location: Kapaa, Kauai

Situation

Several thrips species infest banana plants and fruit in Hawaii. These include the Banana Rust Thrips, *Chaetanaphothrips signipennis* (Hara, et.al), Hawaiian Flower Thrips, *Thrips hawaiiensis* (Mau and Martin), Banded Greenhouse Thrips, *Hercinothrips femoralis* (Mau and Martin), and the Banana Rind Thrips, *Elixothrips brevisetis* (Mau and Martin).

The banana rust thrips has recently been a pest on banana fruit. The thrips feed on the peel between the banana fingers. The resulting damage is a rust colored, curly-cue to oval 'stain.' The damage appears to be cosmetic and does not affect the taste of the fruit however, it reduces the marketability of the fruit. The banana rust thrips also feed on the leafsheaths, resulting in dark 'V' shaped marks on the leaf petiole.

Some commercial banana growers in Hawaii cover the banana bunches with a plastic sleeve. The plastic sleeve has multiple holes in it to allow air movement through the bunch. The sleeves are tied at one end around the pedicle of the banana bunch and usually tied at the bottom as well. The plastic sleeves are specially made and must be ordered in large quantity. One large commercial banana grower purchases the plastic sleeves and has sold smaller quantities to banana growers with small farms. The supply may depend on the goodwill of the large grower.

Banana rust thrip damage

The banana rust thrips infest the bunches despite insecticide sprays and the use of the plastic sleeves. Banana sleeves made out of Agribon floating row cover material was tried to see if it would reduce the banana rust thrips from infesting the bunches.

Method

Five to seven feet wide Agribon row cover material was folded over and heat sealed along the open length to form a sleeve. The length of the sleeve was cut at four feet. Sleeves were slipped over the banana bunches and tied above on the pedicle. Some of the four feet long Agribon sleeves were too short to tie at the bottom of the bunch. Plastic sleeves were also used for comparison. Six Agribon and four plastic sleeves were used. Thermocouple probes were inserted in the bunches to monitor temperature and blue sticky cards were placed around the leaf petiole near the pedicle of the fruiting bunch to monitor thrips. After applying the sleeves, the banana bunches were left for 12 weeks to mature.

Results

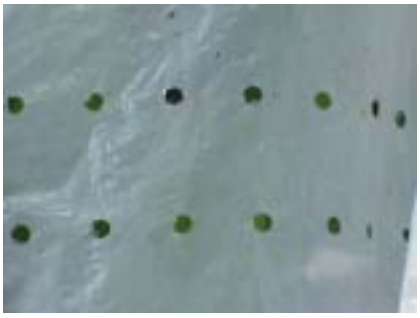
There were no indications of banana rust thrips damage on the harvested fruit and no banana rust thrips were found on the blue sticky traps. However, mealy bugs were found in 8 out of 10 test bunches covered with either plastic or Agribon sleeves. A casual, non-destructive observation was made of uncovered banana bunches in the field where the test was conducted. No mealy bugs were observed on uncovered bunches but some mealy bugs were seen on covered bunches.

Small dark spots on raised pimple-like bumps were noticed on some fruit. These were probably due to the Hawaiian flower thrips egg laying (Pinese and Piper). Hawaiian flower thrips were found on the flowers while still attached to the fruit in other parts of the field.

Overview of Sustainable Techniques Used

Physical Barrier: Plastic Sleeves on banana bunches

Agribon sleeve over a banana bunch



Plastic sleeve with holes in it.

Mean Temperature (º F) of the bunches

Date	4/16	4/25	5/1	5/8	5/15	5/23	5/29	6/5	6/12	6/19
Ambient	81.6	82	81.8	75.8	78.6	80.1	81.4	77.7	78.5	77.6
Agribon	78.8	81.7	81.8	74.2	77.0	74.9	76.7	74.8	78.5	76.9
Plastic	77.7	82.1	82.0	73.9	77.5	77.3	78.0	74.6	78.3	77.1

Temperature readings were made in the morning between 8:30 and 10:30 am. No clear pattern of the mean temperatures emerged. On some days the mean temperature of the bunches covered with plastic sleeves were higher, while on other days the mean temperature of the Agribon sleeves were higher.

Mealy bugs on the fruit

Discussion

The banana rust thrips population must not have been high enough to cause observable damage to the fruit. It appears the banana field with history of banana rust thrips infestation was too far from the test field. The mealy bugs probably infested the banana bunches after they are covered with the sleeves. The mealy bugs may be able to crawl under the sleeve tied around the pedicle which would indicate the banana rust thrips could do the same. More work needs to be done to see if the mealy bugs are already on the bunches prior to covering, if they crawl under the sleeve around the pedicle, or if they crawl in from the open end of the sleeve or through the holes in the plastic sleeve. An insecticide registered for banana such as Ecozin 3% may be used to disinfest the bunch of mealy bugs then cover the bunch with the sleeves. The period between applying diazinon and covering the bunch may be too long, allowing the mealy bug to move in. Ecozin 3% is an azadirachtin (neem) pesticide and may have some effect in reducing banana rust thrips as well.

The cost of one roll of Agribon floating row cover 83" x 250‘ is approximately $27 plus about $32 shipping cost from California. The heating roller cost approximately $200 including shipping. The cost of the first 50 sleeves, each 5 feet long would be about $260 not including labor cost to make them.

The making of the Agribon sleeve is time consuming and not cost effective if the sleeve is used only once. With care, the sleeves may be saved and reused but other considerations are handling of the sleeve with the sticky latex on it and whether the dried latex on the sleeve will scratch the fruit. A small banana farm without access to the plastic sleeves may be able to use the Agribon sleeve several times to make it cost effective but special handling and storing problems need to be considered.

References

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