

**HOT SHOT™ INSECT REPELLENT:
AN ADJUVANT FOR INSECT CONTROL**

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Abstract

Hot Shot Insect Repellent is a natural product derived from extract of hot chile peppers. The product is formulated to deter or repel insects from infesting ornamental or agricultural plants and crops. The product has been evaluated on cotton, ornamentals, vegetables, and other agronomic crops, alone, and in combination with various insecticides. The active ingredient of Hot Shot is oleoresin of capsicum (chile oil), which is the compound that provides that hot sensation when one eats hot peppers. The capsiacin is extracted from chile peppers, and then formulated to provide a product that is soluble in water and suitable for application as a foliar spray. The product has been applied with ground equipment, by air in as little as 3 gallons of water, and also by air in low volume oil applications.

Introduction

The mode of action of Hot Shot Insect Repellent is to provide irritation to insects. This irritation prevents the insects from laying eggs on the target plant or encourages insect movement away from the target plant to seek a more hospitable environment. With insecticide tank mixes, the increased insect movements induced by Hot Shot increases contact with the insecticide on the plant surface and apparently increases the effectiveness of the insecticide.

Consultants report that Hot Shot appears to improve the kill of resistant insects as well as insects that have not shown any indications of resistance. It is believed that this occurs by increasing pesticide contact early on and therefore providing a higher lethal dose of the insecticide to the target insect.

Some of the successful combinations that have improved insect control with Hot Shot are shown in Table I. These include Pennncap-M applied by ground for boll weevil control even in high pressure weevil situations, Scout X-Tra ground and air applications have been very effective in controlling boll worms, bud worms, aphids, and beet army worms under very high pressure. Tank mixes of Hot Shot and Fury applied by air have been effective in increasing the control of boll worms, beet army worms, boll weevils and aphids. Baythroid has also shown, with air applications, control of boll worms, beet army worms, boll

weevils and aphids. Phaser was used in a situation where there was an infestation of boll weevils and aphids and the addition of Hot Shot increased its efficacy. These trials were conducted in the Texas High Plains.

Karate has been successfully used in combination with Hot Shot on boll worms, beet army worms, and aphids as well as fall army worms. Karate has not only been used on cotton, but other crops such as corn and cucurbits for control of army worms and alfalfa weevil.

Additionally, we've seen very good interaction with Hot Shot Insect Deterrent and Malathion for boll weevil control and Lorsban for beet army worm and fall army worm control.

Hot Shot Insect Deterrent (Table 2) has been effective when used alone at rates up to 16 oz/acre and as low as 4 ounces/acre for controlling beet army worm, fall army worm, aphids, boll weevils, alfalfa weevils, bud worms, boll worms, loopers, thrips, mites, and white flies. The work with white flies has been done primarily with ornamentals, such as hibiscus, geraniums, and with vegetables such as tomatoes and cucumbers. Used in combination with insecticides, Hot Shot has been effective in increasing control at rates as low as 3.2 ounces per acre.

Conclusion

Hot Shot's useability for cotton insect control is best summarized by the statement made in a consultant's report from 1995 experiences with Hot Shot:

When Hot Shot Insect Repellent is mixed with other chemicals, those chemicals do the job they were designed to do with a little more initial knock down of the target pest, plus an extension of the effective life of the spray job. In fact, at higher Hot Shot rates, we seem to have some control on old leaves foreextended periods of time and don't have major reinfestations until new leaf growth occurs.

Table 1. Successful combinations with HotShot Insect Repellent that improved insect control at rates as low as 3.2 oz per acre.

| <u>INSECTICIDE (application)</u> | <u>INSECTS TARGETED AND CONTROLLED</u> |
|----------------------------------|---|
| Penncap M (Ground) | Boll Weevils (hi pressure) |
| Scout X-TRA (Ground, Air) | Bollworms, Budworms, Aphids, Beet Armyworms (very high pressure) |
| Karate (Air, Ground) | Bollworms, Beet Armyworms, Aphids, Boll weevils, Fall Armyworms |
| Fury (Air) | Bollworms, Beet Armyworms, Boll weevils, Aphids |
| Baythroid (Air) | Bollworms, Beet Armyworms, Boll Weevils, Aphids |
| Phaser (Air) | Boll weevils, Aphids |
| Malathion (ground) | Boll weevil |
| Lorsban (ground) | Beet armyworms, Fall armyworms |

Table 2. Hot Shot Insect Repellent

| <u>RATE</u> | <u>INSECTS REPELLED OR CONTROLLED</u> |
|-----------------|---|
| 4 to 16 oz/acre | Beet armyworm, Fall armyworm, aphids, Boll weevils, Alfalfa weevils, Budworms, Boll worms, Loopers, Mites, White Flies, Thrips |