The Benefits of Insecticide Use: Nectarines

Western Flower Thrips

Thrips Damage

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Thrips Damage and Nectarine Grades

March 2009

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Key Points

- Prior to the development of insecticides, nectarines could not be grown profitably in California because of thrips infestations
- Thrips feed on the surface of the nectarine and can damage 80% of the fruit in an orchard
- Organic nectarine growers are permitted the use of spinosad for thrips control
- The value of nectarines would decline about 25% without insecticides for thrips control

Technical Summary

The nectarine has been around for a long time. The fruit was mentioned in Chinese literature over 2,000 years ago [1]. Because nectarines may have arisen from peach seeds, most of the world’s peach growing areas have also introduced nectarine varieties [2]. Nectarine fruit differs from the peach because, due to a simple recessive gene, it does not have fuzz [1]. In addition, nectarines are slightly more aromatic than peaches. Most nectarine varieties grown in California have large flowers.

California produces 96% of the U.S. nectarine crop. 436 million pounds of nectarines valued at $114 million are produced annually on approximately 35,000 acres. Because of the importance of its eye appealing characteristics, nectarine sales are based upon delivery of a top quality product to the marketplace [3]. The production of nectarines in California was relatively small until the early 1960s when it began a rapid growth. (Figure 1) One of the major factors accounting for the rapid growth was the development of insecticides (beginning with DDT) for control of western flower thrips [1]. Early reports on nectarine growing refer to certain sections of California where thrips were so serious that production was practically impossible [3]. Without thrips control, the nectarine industry in California would not exist today [3].

Although peach and nectarine are the same species, the smooth skin and calyx that adheres tightly to the developing fruit makes nectarines more susceptible than peach to injury during flowering by thrip species[4]. Western flower thrips is a widely distributed species in western North America. It has a wide host range, having been collected from 139 plant species [2]. As flower lovers, thrips are attracted to all kinds of deciduous fruits during bloom. Nectarine is the most severely injured [2].

Western flower thrips are minute insects about 0.03 inches long, with two pairs of wings. Western flower thrips overwinter as adults in weeds, grasses, alfalfa, cover crops and other hosts either in the orchard or in surrounding fields. In early spring adult thrips migrate to nectarine flowers. Upon entering the flower, adult thrips lay eggs in tender flower parts next to the small fruit [3]. Young thrips, called nymphs, emerge from eggs and feed on the tiny fruit by abrading the skin with their rasping sucking mouthparts. The damaged skin does not grow properly resulting in large scars at maturity. They remain inside the flower where they are protected. Their feeding scars the surface of the fruit. These scars enlarge as the fruit grows [5]. Thrips also cause “silvering” just before
nectarine fruit mature. Two to three weeks before picking, adult thrips lay eggs on the surface of rapidly growing and maturing fruit. Hatching nymphs feed on outer layers of pigment-containing cells which results in bleaching and speckling, thus spoiling fruit appearance [3]. It appears that thrips are attracted either by color changes (green to red) or characteristic nectarine aroma which becomes apparent shortly before picking [3]. At times, this damage is serious enough to cause extensive discoloration and crop loss. Seriously scarred or discolored fruit are culled out. Growers are paid a lesser amount for scarred fruit since the fruit will sell for less in the marketplace.

Chemical spraying for control of thrips has been used by nectarine growers almost from the time of earliest commercial planting [3]. For many years, DDT gave satisfactory control. However, thrips became resistant to DDT and long before its ban it was replaced by parathion which remained the standard insecticide for several decades. Research with insecticides indicated that unmarketable fruit in the unsprayed trees ran as high as 80% [3]. Research in the early 1970s revealed that methomyl and formetanate hydrochloride were as effective as parathion [3].

Insecticides are used on 59% of California’s nectarine acres for early season thrips control and on 23% of the acres for late season control [6]. Growers are advised to monitor for thrips when trees begin to bloom. If adult thrips are common (about 2 per 50 blooms) or if nymphs are found, a treatment is warranted [5]. Without the control of thrips, the value of nectarines would be lowered by about 25%.

Organic growers are permitted to spray the Entrust formulation of spinosad [5]. Research has shown that spinosad applications result in reductions of thrips damage equal to the formetanate applications [7].

Out of a total cost of production of $9600/A for nectarine production, $222/A (2%) is spent on insecticides [8].

References


2. Peaches, Plums, and Nectarines: Growing and Handling for Fresh Market, Editors: James H. LaRue and R. Scott Johnson, University of California, Division of Agriculture and Natural Resources Cooperative Extension.


Figure 1.

![California Nectarine Production](image-url)