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DIFFERENTIAL SUSCEPTIBILITY OF AVOCADO CULTIVARS TO FRUITSPOTTING BUGS, *AMBLYPELTA* SPP. (HEMIPTERA:COREIDAE)

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ABSTRACT

Fruitspotting bugs are the major pests of avocados grown in Queensland, Australia. They feed on the fruit, which usually cracks, resulting in significant losses. Regular insecticide sprays are required to limit the damage. Thin-skinned cultivars have traditionally been considered to be more susceptible to the bugs because feeding damage is expressed on the thin skins as severe cracks and craters. The damage is thus more visible than it is in the thick-skinned cultivars, which often do not crack but form 'blind stings' that are easily overlooked. The bugs are difficult to detect in the trees and monitoring for their activity must be on the basis of damage to the fruit. Data obtained from a sprayed commercial orchard and from an unsprayed experimental block indicate that fruitspotting bugs prefer the thin-skinned cultivars of Fuerte and Wurtz to the thick-skinned cultivars of Hass and Sharwil. Pinkerton appears to be an exception for although it has a medium-thick skin, it was the first to be attacked, possibly because it set fruit earliest, and the damage inflicted was severe.

In the sprayed commercial orchard, damage to Fuerte (1.9%) and Wurtz (4.3%) was significantly higher than that recorded on Hass (0.04%) and Sharwil (0.03%). In the unsprayed block, damage was 68.5% on Pinkerton, 73.6% on Fuerte and 18.9% on Hass. In orchards that consist of mixed plantings that include Fuerte, Wurtz or Pinkerton, these cultivars can be used as indicator trees for monitoring fruitspotting bug activity and also as decoy trees for targeted control.

Key Words: fruitspotting bugs, avocados, thin-skinned

INTRODUCTION

Fruit spotting bugs cause serious damage to most tree fruit and nut crops grown on the east coast of Australia (Waite, 1990). They breed on many native host plants as well as a wide selection of exotic ornamentals, from which the adult bugs migrate into orchards throughout the fruiting season (Waite and Huwer, 1998). The bugs are especially attracted to fruit just after it has set and damage at this stage usually results in the fruit falling from the tree. Many crops including avocados, are susceptible from fruit set in spring through to fruit maturity in autumn. Orchards in particularly susceptible locations, which are generally in proximity to rainforest breeding areas, require frequent sprays to prevent devastating damage. Such sprays are usually of endosulfan, the use of which has been questioned on environmental grounds. On the other hand synthetic pyrethroids, which provide excellent control of the bugs, may result in increased spraying of various types of insecticide because of the disruption of beneficial insects and mites with the resulting flare of secondary pests such as mites and scales.

Research is currently focused on an investigation of the fruitspotting bug hotspot phenomenon and whether such areas of an orchard can be used for targeted monitoring and control. In conjunction with this the relative susceptibility of different avocado cultivars to fruitspotting bugs has been investigated with a view to growing the most susceptible cultivars as trap or decoy trees so that the bugs can be destroyed with minimal effort and cost before they disperse throughout the orchard.

MATERIALS AND METHODS

Various known fruitspotting bug hosts were considered for assessment as possible trap trees for the purpose of monitoring and control. The increasingly popular ornamental plant, orange jessamine, *Murraya paniculata*, is very attractive to both species of fruitspotting bug. However, fruit needs to be present on the plants to attract bugs and individual plants fruit inconsistently. Moreover, on the Sunshine Coast of Queensland at least, *Murraya* does not carry a significant fruit load after October and so, although it is very attractive to adult bugs in spring and may act as a local focal point for early season breeding, it does not attract bugs for the major part of the avocado season. The most consistently attractive and convenient bug host would be an avocado cultivar that is more attractive to the bugs than are others, and in which the damage is easily detected as it is inflicted. Fuerte is an obvious candidate for this role along with Pinkerton and Wurtz. Fuerte trees were closely monitored in a commercial orchard at Woombye, and fruitspotting bug damage was compared with that on Hass, Wurtz and Sharwil. At Maroochy Research Station Fuerte, Pinkerton and Hass were compared for the timing and intensity of fruitspotting bug attack. The number of fruit that showed fruitspotting bug damage on datum trees was recorded. On the final assessment date, the total number of fruit on the trees was counted, in addition to fruitspotting bug damaged fruit.

RESULTS AND DISCUSSION

At Woombye, observations of damage to the fruit indicated that Fuerte did indeed suffer much more damage than Sharwil or Hass, and although the damage was also easier to see on the thin-skinned Fuerte, the difference was real and not just apparent. Wurtz fruit tended not to show bug damage clearly, and it was manifest at harvest mostly as smooth dimples rather than the cracks or craters that develop in Fuerte. A row of Wurtz trees immediately adjacent to a stand of wild guavas proved to be a major hotspot in this orchard. Assessment at harvest showed that damage to Fuerte (1.9%) and Wurtz (4.3%) was significantly higher than that recorded on Hass (0.04%) and Sharwil (0.03%).

In the mixed, unsprayed orchard at Maroochy Research Station, Pinkerton was the first to set fruit and so was the first to be attacked by bugs. Eight fruit on one of two Pinkerton trees were damaged on 8 October 2002. This increased to 23 and then 32 over the next two weeks. By 18 November the two Pinkerton trees had 102 damaged fruit while two Fuerte trees nearby had a total of 11 damaged fruit. By then the Hass fruit was at a stage that was attractive to the bugs and 15 fruit were damaged on two trees adjacent to the Pinkerton trees. As the season progressed, some of the damaged Pinkerton and Fuerte fruit developed anthracnose and fell, but it remained clear that both these cultivars suffered much greater and earlier damage from the bugs in October and November than did the other cultivars, and attack continued through January, February and March. In contrast, damage on Hass did not increase significantly after the initial period of attack in November and December (Table 1). At final assessment, mean damage was 68.5% on Pinkerton, 73.6% on Fuerte and 18.9% on Hass.

Over the past decade, avocado growers in south east Queensland have tended to remove Fuerte from their orchards because of the amount of damage that was caused by fruitspotting bugs. This damage resulted despite frequent applications of insecticidal sprays. Since the bugs will attack all cultivars, the action of removing the most attractive cultivar merely removed the distraction that Fuerte trees formerly provided, allowing the bugs direct access to cultivars such as Hass, Sharwil and Wurtz.

CONCLUSIONS

These data support the proposition that rather than culling Fuerte trees from orchards because of their susceptibility to fruitspotting bugs, they should be retained precisely for that reason as indicator/trap trees, and to act as a decoy for the pests to reduce the damage that might be inflicted on the more highly regarded cultivars.

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Table 1: Maroochy Research Station fruitspotting bug trap tree assessment, 2002- 03.

Number of damaged fruit per tree. All trees were un-sprayed – no insecticides or fungicides applied.

Date	Pinkerton 1	Pinkerton 2	Fuerte 1	Fuerte 2	Hass 1	Hass 2	Hass 3
8 Oct.	8	0	0	0	0	0	0
14 Oct.	23	0	0	4	0	0	0
21 Oct.	32	0	0	4	0	0	0
4 Nov.	51	5	4	4	0	0	0
18 Nov.	74	18	8	4	0	6	9
29 Nov.	124	63	14	8	8	22	11
10 Dec.	124	63	48	14	8	22	11
24 Dec.	124	63	48	14	8	25	21
7 Jan.	124	72	14*	30*	8	31	44
Final assessment – 2 April 2003							
Total fruitspotting bug damaged fruit on each tree							
	138	88	56	169	11	31	44
Total fruit on each tree							
	168	160	104	181	90	151	182
Percent fruitspotting bug damage on each tree							
	82.1	**55.0**	**53.8**	**93.4**	**12.2**	**20.5**	**24.2**

* the trees were unsprayed and severe anthracnose infection resulted in significant fruit drop