Vegetable beetle, *Gonocephalum misellum* (Blackburn), a pest of canola in southern Western Australia.

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Abstract

Vegetable beetles will feed on canola regardless of the presence of alternative food sources. Rates of feeding damage are higher at temperatures above 15?C. These results support field observations that vegetable beetles can be an economic pest of winter grown canola in southern Western Australia in some seasons.

Key Words

Vegetable beetle, Gonocephalum misellum, Brassica napus, oilseed canola

Introduction

Historically, agronomists and growers have suggested vegetable beetle causes damage to canola crops (Michael pers. comm. 2005; McTaggart pers. comm. 2005). The vegetable species in southern Western Australia was identified as *Gonocephalum misellum* (Blackburn) (Matthews pers. comm. 2004). This species is known to damage summer-grown crops, for example sunflower. Its larvae (also known as false wireworms) are present in the soil from autumn to spring, but are not known to cause damage to canola (Hopkins pers. comm. 2006; Michael 2002).In most investigated incidences, prior to 2006, other pest species were found to have caused crop damage (Michael pers. comm. 2005). In 2006, some growers in the southern regions of Western Australia with early (April) sown canola crops at the 3- to 5-leaf stage observed vegetable beetle chewing stems and growing points. In some cases, portions or whole paddocks have had to be reseeded (Mangano 2006a; Mangano 2006b).

A laboratory trial was conducted in 2005 to determine if there is a correlation between temperature and potential vegetable beetle damage. The potential link between temperature and this season is discussed.

Methods

Canola and wild radish seedlings at the cotyledon stage, ryegrass with 3 leaves and clover with 2 true leaves, were transplanted randomly into white plastic boxes measuring 30 cm x 50 cm x 15 cm as per treatments: Treatment A- 10 canola seedlings alone; Treatment B- 10 seedlings, each of: radish; ryegrass, canola and clover. To each treatment 10 beetles were added. Treatments were incubated for 7 days in a plant growth cabinet (Thermoline TPG-1260-T0) and each experiment was conducted at different temperatures (5, 10, 15, 20, 25?C). Two replicates of each treatment were run at each temperature. Humidity was in the range 50- 70%.

Cumulative counts of plant survival were undertaken at daily intervals. A score of 1 was given to all plants that were intact, a score of 0.5 was given to all plants that were chewed and a score of 0 was given to all plants that had no green leaf material remaining. Treatment responses were compared after fitting exponential decline functions to plant numbers.

Results and discussion

Canola plant survival was affected by vegetable beetles feeding (Figures 1 and 2). Feeding damage was minimal at or below 15?C (0-6% plant number decline per day) and greatest at 20-25?C (15-59% plant number decline per day).

Beetles exposed to temperatures of 5?C ceased feeding after day 1 (Figures 1 and 2). It is likely that feeding damage was initiated in the first 24 hours prior to temperature stabilisation throughout the experimental units.

Previously, vegetable beetles were not considered to be pests of winter-grown canola. In 2006 vegetable beetles caused damage to winte-grown canola in southern Western Australia. The major difference between the 2005 and 2006 growing seasons was slow growth of April-sown canola and decreased alternative feed (weed growth) in paddocks due to moisture limitations. Temperatures in 2006 in the region, in April and May, appear to have been suitable for vegetable beetle feeding damage (Table 1), based on rates of feeding damage observed in these studies (Figures 1 and 2).

Figure1. Rate of canola consumption by vegetable beetle (*Gonocephalum misellum*) in the absence of alternative food sources.

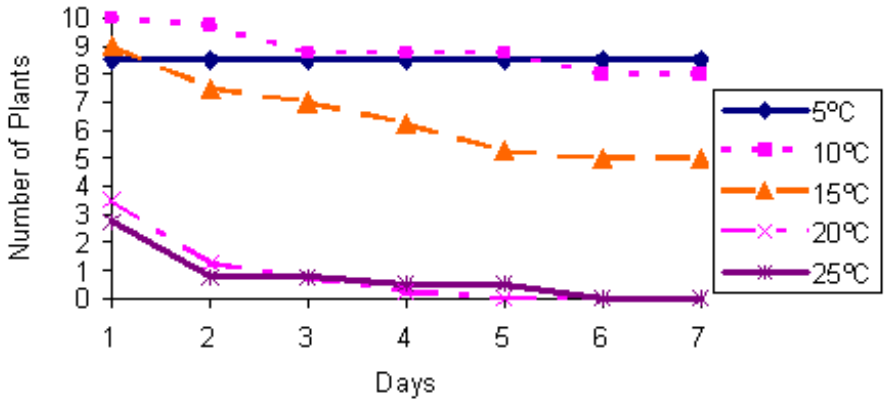

Figure 2. Rate of canola consumption by vegetable beetle (*Gonocephalum misellum*) in the presence of alternative food sources.

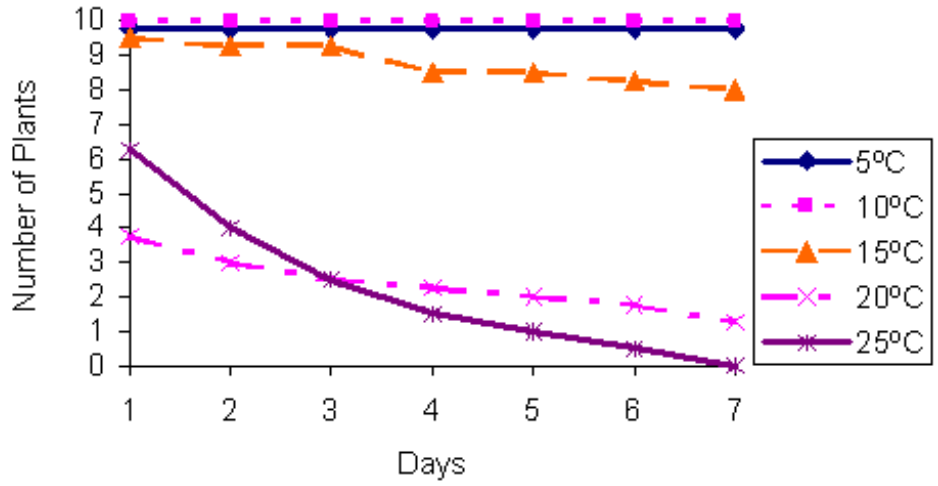

Table 1. Average temperature and rainfall from weather station data operated by the Department of Agriculture and Food at Mt Barker, Jerramungup, Katanning and Esperance.

Year	Month	Air temperature (?C)		Soil temperature (?C)		Rainfall (mm)
		Min	Max	Min	Max.	
2006	April	9.57	18.83	14.50	21.17	1.79
2006	May	8.18	18.24	11.97	18.06	0.74
2006	June	5.23	16.27	8.81	14.84	0.77

Conclusions

Vegetable beetle may cause economic damage to canola under winter conditions. However, the rate of damage is greater in warmer conditions when temperatures are higher than 15?C. The availability of food sources other than canola may decrease crop damage.

Acknowledgements

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References

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