

Rednecked Cane Borer and Broad Mite Monitoring and Management

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Abstract

Rednecked cane borer, *Agrilus ruficollis*, larva girdles a blackberry primocane causing a gall that predisposes cane to winter injury and yield loss. 'Wye Berry' had significantly more galls than the other seven cultivars and 'Chester' had significantly fewer galls than did 'Lucretia' and 'Wye Berry'. A green multifunnel trap coated with fluon can be used to monitor adult flight from early-May to mid-July and improve timing insecticide sprays. One soil drench application of Imidacloprid to base of blackberry plants in April and several weekly blackberry foliar sprays of JMS Stylet Oil in May significantly reduced the number of galls per plant.

Broad mites, *Polyphagotarsonemus latus*, is a new pest of blackberry, blueberry and grapes in Arkansas. It has caused terminal leaf cupping (upward in Summer and downward in Fall), reduced leaf area, aborted flower buds and caused significant yield loss and cane death in blackberries in Arkansas and North Carolina. Photographs of this mite and its damage on blackberries are presented as well as miticidal efficacy of Agri-Mek, Oberon and Zeal. **Growers are asked to look for and report this pest to Extension.**

Introduction

The **rednecked cane borer** (RNCB), *Agrilus ruficollis* (F.), is a pest of blackberries in the Eastern parts of the United States. Adults fly from late-April to early-July, feed, mate and lay eggs only on the blackberry primocane. First instars girdle the primocane causing a gall on the cane. Galls predispose cane to winter injury, i.e., poor spring growth and reduced yield (Walton 1951, Johnson 1992). Hixson (1939) reported 11 blackberry cultivars resistant to attack by RNCB: Advance; Austin Mayes; Best of All; Blower; Rosborough; Brazos; Early Harvest; Lucretia; Ozark Beauty; Mesereau; and Youngberry. To date, no trap has been developed for monitoring RNCB adult flight, and only one insecticide, imidacloprid (Admire Pro), is recommended for control.

The **broad mite**, *Polyphagotarsonemus latus*, occurs world-wide, has a large host range (bell peppers, ornamentals and citrus). Its toxic saliva distorts terminal growth of leaves and flowers. In 2007, it was first reported to damage terminals and flowers of primocanes of primocane-fruiting blackberries (Vincent 2008; Vincent et al. 2010). In 2014, there were grower requests for management tactics for broad mite on blackberries: Arkansas, California, North and South Carolina. There was also a report of broad mites damaging blueberry and grape in Arkansas (Johnson, unpublished data).

Objectives

The goals of these studies were to develop science-based blackberry best management programs for rednecked cane borer and broad mite.

- 1) To compare cultivar susceptibility to RNCB among blackberry cultivars
- 2) To develop a trap for monitoring rednecked cane borer
- 3) To compare effectiveness of insecticides against rednecked cane borer
- 4) To describe broad mite and its damage to blackberries
- 5) To evaluate miticide efficacy against broad mites on blackberries

Methods

Rednecked Cane Borer

Cultivar Study: In 2010, planted 3 plant plots of 9 blackberry cultivars in RCB (4 replicates) and counted galls per cane in Fall 2014 in Fayetteville, AR.

Trap: In 2014, staked 3 green multifunnel (12 funnels) traps (ChemTica) coated with fluon by blackberry plants in three locations and made weekly counts of RNCB adults per trap.

Control: In 2011, 20 plant plots (4 replicates) on: 29 April soil drenched Admire Pro to base of blackberry plants; 2 May applied four insecticides to foliage; 17 May reapplied Avaant and Fanfare; 2, 10, 17, 24 May applied Organic JMS Stylet Oil and Botanigard to foliage. On 14 October, 2011 the number of RNCB galls on each primocane per treatment was recorded.

Broad Mite

Identification and Damage: In Summer and Fall 2014, photographed broad mites and damage caused to blackberries in three locations in Arkansas.

Control: On 22 October 2014, used airblast Stihl sprayer to apply miticides to broad mite infested blackberries in 5-plant plots (RCB, 4 replicates) and counted number of broad mites per leaflet at 0 and 7 days after treatment.



Figure 1. Rednecked cane borer A) larval girdling and tunneling of cane produced B) gall on cane, C) larva in cane pith, and D) healthy foliating cane (left) and galled, winter injured cane (right)

Results: Rednecked Cane Borer

Cultivar Study: Wye Berry (pedigree: *Rubus phoenicolasius*; Origin: East Asia) had significantly more RNCB induced galls than seven of the North American blackberry cultivars. Chester (pedigree: SIUS 47 (US 482 x Darrow) x Thornfree) had significantly ($F = 8.76$, $P < 0.001$) fewer galls than did Lucretia (pedigree unknown; *Rubus* hybrid in 1876 in West Virginia) and Wye Berry (Fig. 3).

Trap: A green multifunnel trap (ChemTica) coated effectively captured RNCB adult from early-May to mid-July 2014 (Fig. 4). (Kim 2014)

Control: A late-April soil drench of Imidacloprid to base of blackberry plants and 4 weekly foliar sprays of JMS Stylet Oil in May significantly reduced ($F = 3.25$; $P < 0.03$) number of RNCB galls per plant (Fig. 5). (Kim 2014)

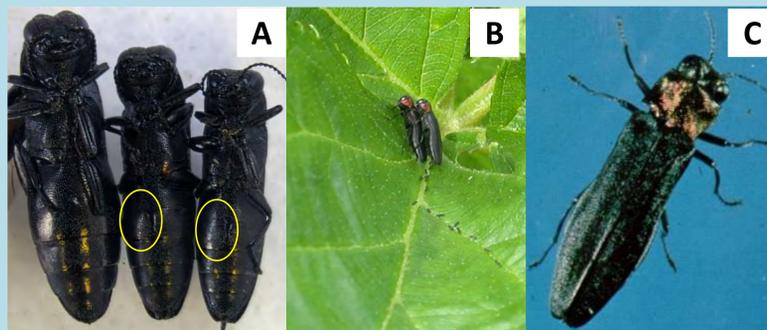


Figure 2. Rednecked cane borer adults: A) female (left) and two males where yellow circles highlight the sex distinguishing ventral groove on the fourth sternite of males, B) mating pair, and C) dorsal view of adult with red prothorax ('neck').

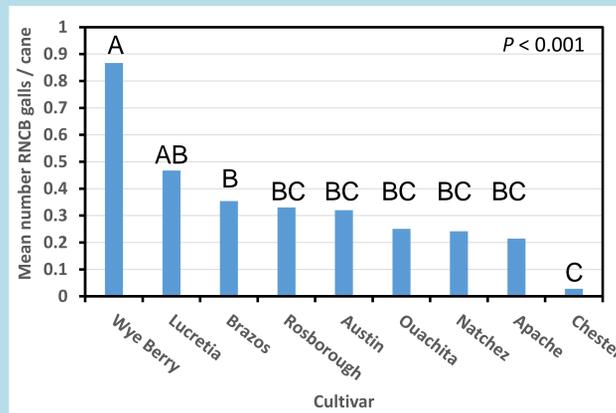


Figure 3. Significant differences in mean numbers of rednecked cane borer caused galls among nine blackberry cultivars Fayetteville, AR (2014)

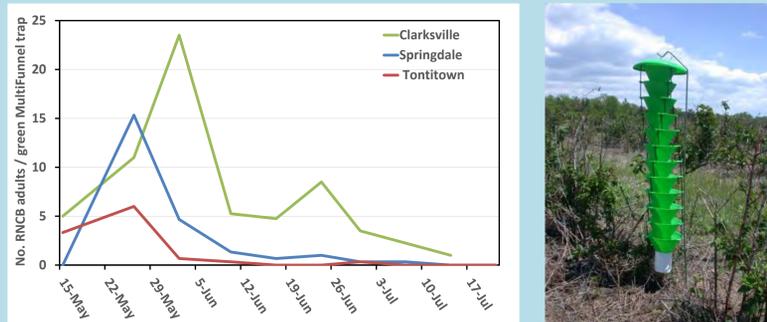


Figure 4. Seasonal catch of rednecked cane borer adults per green multifunnel trap in three blackberry fields in Arkansas (2014)

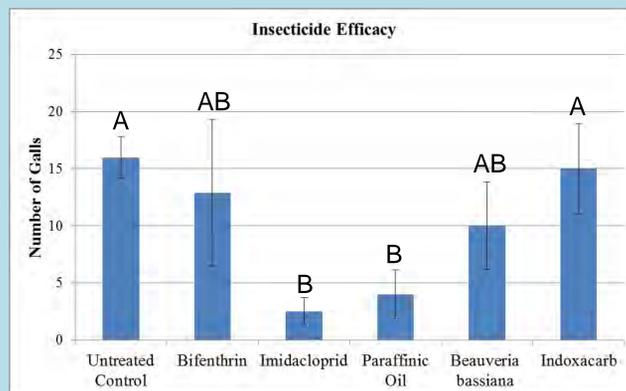


Figure 5. Two insecticides significantly reduced the number of rednecked cane borer caused galls on treated blackberries in Clarksville, AR (2011)

Results: Broad Mites

Identification: Photographs of broad mites and eggs (Fig. 6)

Damage: Broad mites fed on the underside of expanding terminal leaflets that caused cupping (upward in hot summer and downward in cooler fall) (Fig. 7), reduced leaf area, deformed flower buds and reduced blackberry yield in Arkansas and North Carolina (Fig. 7, 8).

Control: One application of Agri-Mek, Oberon or Zeal on 22 October significantly ($F = 4.1$, $P < 0.008$) reduced numbers of broad mites recorded 7 days after treatment (Table 1).



Figure 6. Broad mites: A) eggs (Photo: BARC-USDA), B) male carrying white, immature female, and C) adults and egg on leaf (Photo: U. MN)

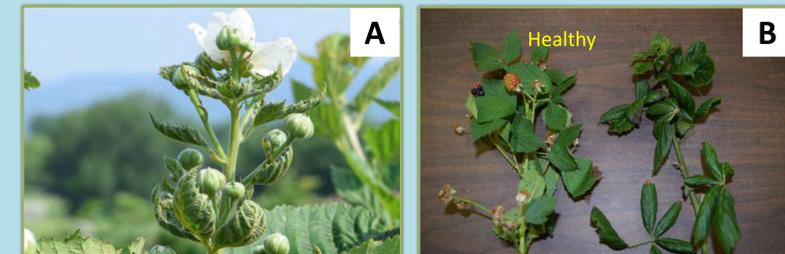


Figure 7. Broad mite feeding on blackberries caused reduced sized leaves but leaf cupping differed from A) summer (upward) to B) fall (downward)

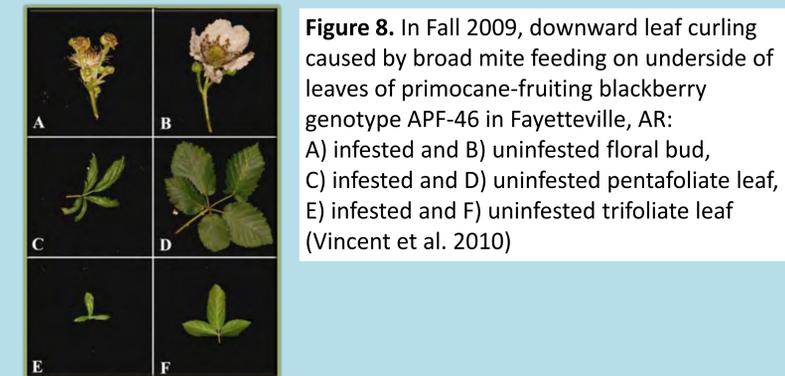


Figure 8. In Fall 2009, downward leaf curling caused by broad mite feeding on underside of leaves of primocane-fruiting blackberry genotype APF-46 in Fayetteville, AR: A) infested and B) uninfested floral bud, C) infested and D) uninfested pentafoliate leaf, E) infested and F) uninfested trifoliate leaf (Vincent et al. 2010)

Table 1. Efficacy of miticides against broad mite on infested blackberries in Clarksville, AR (2014)

Formulation	No. broad mites/blackberry leaflet	
	0 DAT (Oct. 22)	7 DAT (Oct. 29)
Agri-Mek	0.5a	0.07b
Oberon	6.2a	0.0b
Zeal	10.9a	0.0b
Untreated control	8.8a	4.5a
P =	0.07a	0.008

Means within column followed by same letter are not statistically different (Tukey's Studentized Range (HSD) test, $P > 0.05$)

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Citations:

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