

SPIDER MITE CONTROL ON RED RASPBERRY, 2009

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Field trials.

On 28 July 2009, a pretreatment sample of 20 leaflets/plot were taken from a 'Willamette' field scheduled to be removed after harvest in the Northwood area of Lynden, WA. The population of twospotted spider mite, *Tetranychus urticae* (TSSM) had exceeded our provisional economic threshold of 25 motile mites/leaflet soon after harvest. Treatments were applied on 29 July 2009, replicated five times and plots measured 30 feet long by 10 feet wide. Applications were applied with a tractor-mounted Rear's hydraulic plot sprayer equipped to deliver 150 gpa at 1.8 mph with 2-8004 nozzles on top of the boom, with both vertical arms each equipped with 6-D2-45 TeeJet™ nozzles at 125 psi. Acaricides field-tested included experimental Acramite 4SC (bifenazate) at 16 fl oz/acre, Savey 50DF (hexythiazox) at 6 oz/acre, Vendex 50WP (fenbutatin oxide) at 2 lb/acre, experimental Envidor 2SC (spirodiclofen) at 18 fl oz/acre and UTC. Motile life stage counts were made periodically by randomly collecting 10 terminal leaflets from each side of the row, brushing them with a mite brushing machine onto glass plates coated with a thin film of dishwashing detergent. All data were subjected to ANOVA and means were separated by LSD ($P = 0.05$).

Given an average pretreatment count of 30 motile TSSM/leaflet (Fig. 1), after 3 DAT each miticide provided 2-3-fold suppression of the late season populations that were significantly less than the UTC density. At 8 and 17 DAT, Acramite levels were significantly different from the other treatments. Though increasing again by 8 DAT, the other acaricides were nearly 3-4-fold less than the untreated check. Envidor suppression of TSSM was significantly different from Vendex and Savey at 17 DAT. We terminated this trial earlier than planned because the grower wanted to replant the field with the 'Totem' cultivar.

On 6 August 2009, a similar study with identical experimental design was conducted at the WSU NWREC, Mount Vernon, WA on 'Meeker' infested with a mixed population of dominantly TSSM and subordinate but increasing late season yellow spider mite, *Eotetranychus carpini borealis*, above the economic threshold of 25 motiles per leaflet for red raspberries (Fig. 2). At 8 DAT, Acramite and Envidor plots averaged 4.7 and 3.6-fold fewer spider mite per leaflet than the UTC. The study had to be terminated as we needed to cover the 3 acre block with Acramite after 8 DAT in order to contain a rapidly increasing spider mite population that was at 93 motiles per leaflet in the untreated check.

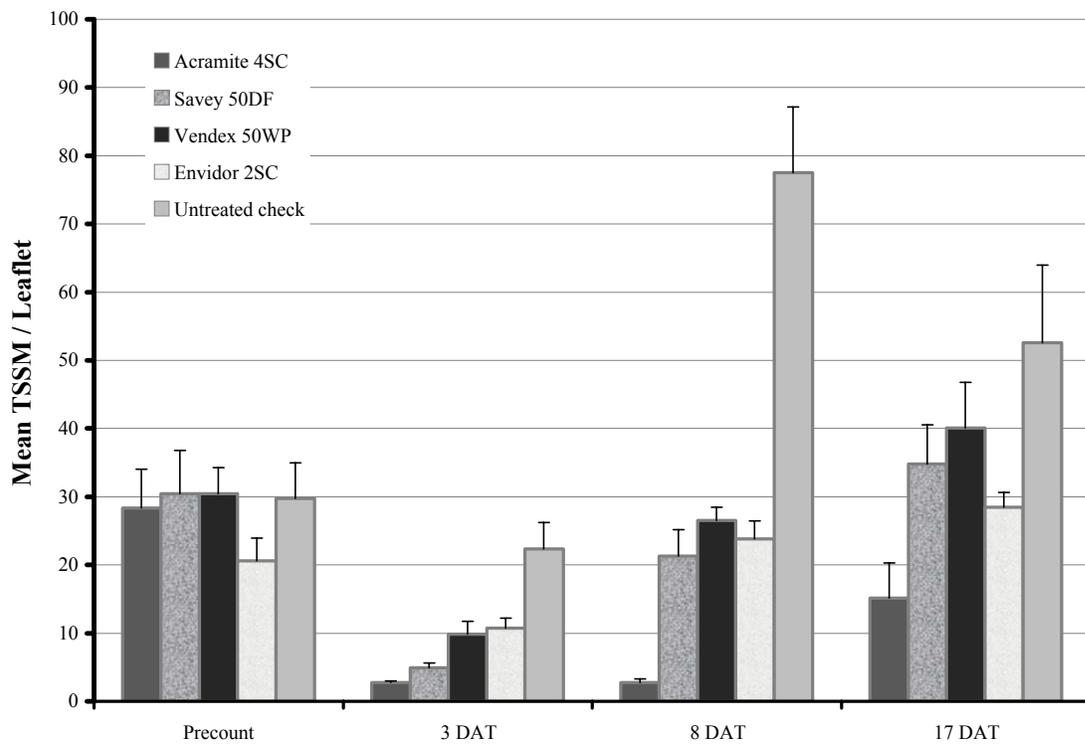


Fig. 1.

Fig. 1. Treatment results for TSSM on red raspberry, Lynden, WA, 2009.

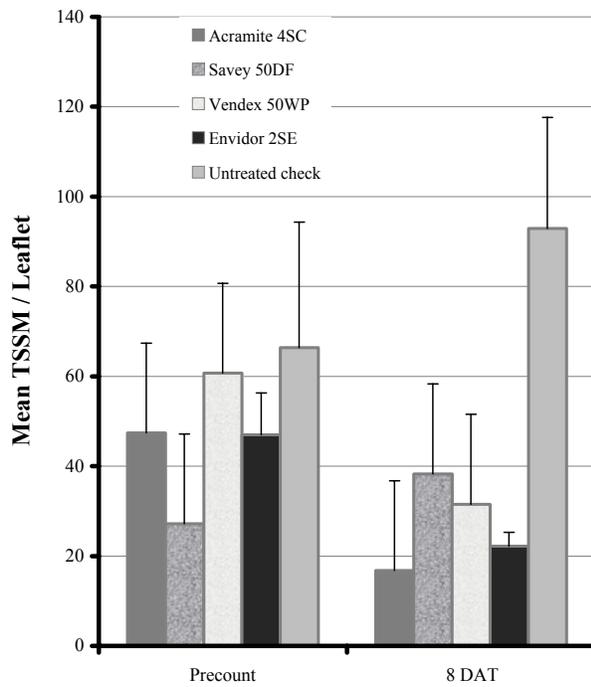


Fig. 2. Treatment results for TSSM on red raspberry, Mount Vernon, WA, 2009.

Laboratory bioassay.

A laboratory leaf disc bioassay was conducted with twospotted spider mite females to compare the efficacy of the above acaricides and two rates of the insecticide/acaricide Brigade 2EC at 3.2 and 6.4 fl oz/acre under controlled laboratory conditions. A Potter Precision Laboratory Spray Tower™, calibrated to deliver 2 ml aliquots of acaricide at 50 pKa on the lower surface of red raspberry discs 25 mm in diameter. Leaf discs were then placed upside down on water saturated cotton absorbent pads in 88 mm diameter Petri dishes. Five adult TSSM females were transferred from infested red raspberry leaves to each leaf disc. A total of 90 TSSM females were used for each treatment. They were held at room temperature and examined for percent mortality at 1, 2 and 5 DAT. At 1 DAT, 100% of the TSSM were dead when treated with the field rate of 16 fl oz/acre of Acramite 2SC (Fig. 3). TSSM female mortality at 5 DAT was: Vendex (97%), Envidor (89%), Brigade low rate (56%), Brigade high rate (80%), Mustang (77%), Mustang MAX (55%), Vendex (97%) and UTC (7%). The miticidal activity of our registered acaricides for red raspberry is excellent, with acceptable control from our field rate of Brigade commonly used as the preharvest, broadspectrum clean-up spray. The marginal performance of the lower rate of Brigade and Mustang was expected.

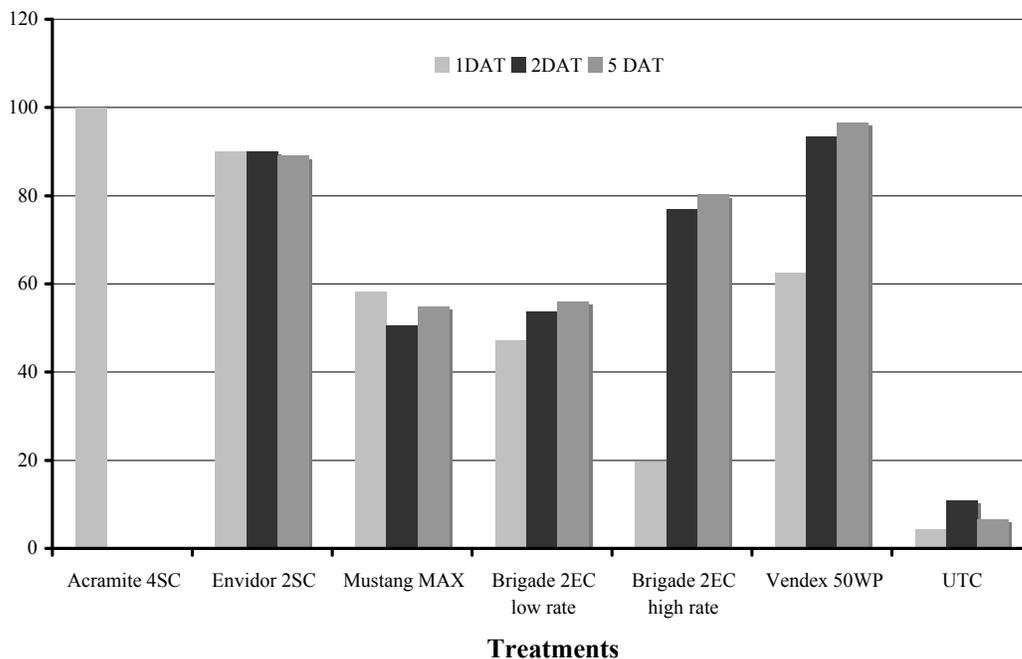


Fig. 3. Twospotted spider mite bioassay, 2009