

Can Surround™ Be Applied Successfully with a Back-pack Sprayer to Control Plum Curculio?

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In the preceding article, information was presented on the effectiveness of kaolin clay (Surround™) in controlling plum curculio (PC) when applied by a mist blower to apple trees on M.26 rootstock at the Horticultural Research Center. Good though not excellent control was obtained using four applications 10 days apart. In the summer 1999 issue of *Fruit Notes*, we reported results of a 1999 trial in which Surround was applied twice against PC to M.26 trees using a Solo™ motorized back-pack sprayer. That study occurred in my small orchard of scab-resistant cultivars in Conway. Again, control of PC was good though not excellent.

Here, I report results of a 2000 trial evaluating effectiveness of Surround applied against PC in my orchard using the Solo sprayer.

Materials & Methods

The trial was carried out using six rows of Liberty apple trees, each with five trees per row. Every other row was sprayed three times with Surround: May 16 (petal fall), May 25 and June 6. Surround was applied at the recommended rate of 50 pounds per acre. Remaining rows were sprayed on these same dates with phosmet at 3 pounds of 70 WP per acre. After June 6, no insecticides were applied to any trees in the orchard. Four apple trees about 200 yards away did not receive any insecticide and served as indicators of PC pressure in the area. At harvest, one-sixth of the fruit (approximately 70 fruit) on each tree were sampled for PC egg-laying scars.

Results

Results (Table 1) show that three sprays of Surround were much less effective than three sprays of phosmet in controlling PC in my orchard. Untreated trees about 200 yards away

received a large amount of PC injury, but these trees were of different (unknown) cultivars than the Liberty trees in the orchard. Approximately 12 inches of rain fell between May 15 and June 30 (the approximate end of the PC season), which might have compromised the residual effectiveness of Surround to a greater extent than that of phosmet.

Remarks & Conclusion

I experienced little difficulty in mixing the 2000 version of Surround WP in a small amount of water and introducing the mixture as a slurry into the 3-gallon tank of the sprayer. Maintaining adequate mixing of Surround with water did require me to jounce the sprayer frequently, however. This was not kind to my back. To attain the very thorough coverage needed for Surround to be effective in controlling PC on trees 10 feet tall required 0.6 gallons of mixture per tree per application. Effective application of phosmet required only 0.25 gallons of mixture per tree, less than half as much. This resulted in more frequent filling of

Table 1. Percent apples infested by plum curculio adults in commercial orchard trees receiving three applications of Surround or phosmet, Conway, MA, 2000.

Treatment	Number of trees	Injured apples (%)
Surround	14	15.5
Phosmet	15	2.3
Untreated*	4	91.0

*Data from sampled fruit of unsprayed trees of unknown cultivar about 200 yards from the orchard trees.

the spray tank when using Surround.

The greatest challenge of attaining effective PC control with Surround using a motorized back-pack sprayer lies in keeping the new growth of apples and foliage covered with Surround. Unlike phosmet, Surround is not toxic to PC or any other insect. Its mode of action is one of repellency. If a PC or other insect finds a treated surface unacceptable, it can crawl or fly to an untreated or incompletely treated surface and cause damage.

In my judgement, the main reason why Surround performed much better in relation to phosmet in the trial using a tractor-driven mist blower (as reported in the preceding article) than in the trial reported here was the more thorough

coverage obtained using the mist blower. Coverage was especially important in 2000, a year in which PC pressured orchards to a much greater extent than in 1999.

My conclusion, based on 2 years of experimentation with Surround vs. phosmet in my orchard, is that phosmet achieves considerably better control of PC than does Surround when application is by a motorized back-pack sprayer and that it does so with much less labor associated with application and with much less cost of material. Despite its shortcomings when applied by a back-pack sprayer, Surround nevertheless does offer the potential for better control of PC on backyard apple trees than does any other non-toxic material investigated to date.

