PROC. N.S. INST. SCI (1985)
Volume 35, pp. 107-108

# THIRAM DORMANT SPRAY FOR THE CONTROL OF TAPHRINA COMMUNIS (SADEB) AND ITS RESIDUES IN PLUM FRUIT[1]

Bladder plums or plum pockets, caused by the fungus *Taphrina communis* (Sadeb.) Giesenhagen, is a common disease of European (*Prunus domestica* L.) and Japanese plums (*Prunus salicina* Lindl.) in eastern Canada. The fungus persists on the twigs and bark and host organs are susceptible only when young and tender in the early spring. Plum shoots, flowers, leaves and fruit may all be infected with *T. communis* but the characteristic symptom is swollen and distorted fruit. Two to three weeks after blossoming, small whitish blisters appear on infected fruits. Blisters grow rapidly soon enveloping the whole fruit. At this stage infected plums are elongated, wrinkled, often distorted and almost white. Within a short time they turn brown and drop. Although plum pockets occur in New Zealand on plums it is a different, but closely related fungus species that causes their disease. Our species occurs only in Eastern and Middle North America but produces the same plum pocket symptoms on the fruit as the New Zealand species.

Until recently Bordeaux mixture (8-8-100) applied before bud burst in the spring was the only fungicide available for control of plum pockets. As an orchard fungicide this material has been largely displaced by the more easily handled organic materials. The fungicide thiram (tetramethyl thiuram disulphide) 75 WP at 4.9 kg active ingredient (a.i.)/ha was found to give effective control of *T. communis* and is one of the least phytotoxic materials to foliage and fruit of plums (Gourley 1961). The present study was initiated to obtain information on residues in plum fruit following a dormant season (mid April) application of thiram at the above rate in 3370 liters of water to Burbank plum trees in 3 replicated plots (each consisted of 2 trees) at two locations, Kentville and Wolfville, Kings Co., Nova Scotia. A fourth replicate (2 trees) in each location was kept as check and all replicates were arranged at random in rows. All 16 trees received the recommended summer sprays to control other diseases and insects. In late August, two random samples of ripe fruit (30 each) were collected from each tree at Kentville and Wolfville. Fruit samples were frozen immediately at -10°C and held until residue analysis was made colorimetrically for thiram, using essentially the modified standard carbon disulfide evolution procedure (Keppel 1971). After removing the plum pits the fruit were cut into small portions, mixed, and 100 g were boiled with dilute hot hydrochloric acid and stannous chloride under a reflux condenser. The evolved carbon disulfide was then reacted with ethanolic solution of cupric acetate-diethanolamine. The resultant yellow-complex was measured at 435 nm and thiram residue was calculated from the carbon disulfide found. The practical limit of detectability of the method is 0.05 ppm. Analysis was made on each fruit sample along with fruit samples that received no thiram treatment (check) and fortified fruit check samples at 0.05 ppm thiram.

Satisfactory recoveries of thiram were obtained from fortified check fruit samples (Table I). Table I indicates also that no detectable residues of thiram were found in plum fruit from either location. This study demonstrates that there is no risk of fungicidal residues in the fruit when thiram was applied as a dormant spray to plum trees for the control of plum pocket disease. Thiram is now registered and recommended for control of the above disease in Canada.

[1] Contribution No. 1690, Agriculture Canada, Research Station, Kentville, Nova Scotia.

**Table I** Thiram residues in plum fruit.

| Location | Check (ppm)[1] | Recovery (%)[2] from fortified check | Thiram (ppm) from treated trees[3] |
|---|---|---|---|
| Kentville | NDR[4] | 96.37 | NDR[4] |
| Wolfville | NDR | 98.30 | NDR |

[1] Average of 4 determinations from the check replicate (2 trees).
[2] Average of 4 determinations from the check replicate (2 trees). Fortification level 0.05 ppm thiram.
[3] Average of 12 determinations from the 3 replicates (6 trees).
[4] No detectable residues, 0.05 ppm.

## Acknowledgement

The author thanks C. O. Gourley and G. Rudulf for thiram treatments in this study.

## References

**Gourley, C. O.** 1961. Control of plum pocket disease in Nova Scotia. *Can. Plant Dis. Surv.* 41:174.

**Keppel, E. G.** 1971. Collaborative study of the determination of dithiocarbamate residues by a modified carbon disulfide evolution method. *J. Assoc. Off. Anal. Chem.*, 54:528-532.

M.T.H. Ragab, Research Station Agriculture Canada, Kentville, N.S., B4N 1J5.