Control of brown rot blossom blight (*Monilinia laxa*) on apricots – preliminary results

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Abstract

During spring 2011, the effect of copper, sulphur, sodium bicarbonate, lime sulphur and plant resistance improver based on algae extract (Alginure) on brown rot blossom blight on apricots was studied. The small-plot trial was conducted in the commercial apricot orchard (variety Pincot) located in South Moravia (Czech Republic). Selected preparations were sprayed three times during flowering (April 7, 11 and 14). Evaluation was done on May 6 according to the EPPO 1/38(2) method. All treated variants were significantly different from the untreated control (F 6.3191, P 0.000264). The most effective was copper 66 % following by sodium bicarbonate 63 %, Alginure 63 %, sulphur 56 % and lime sulphur 38 %. Alginure achieved 65% efficacy in semi-field trial in the same location.

Keywords: apricot, *Monilinia laxa*, brown rot blossom blight, organic agriculture

Introduction

The causal agent of brown rot blossom blight in stone fruits is fungus *Monilinia laxa*. In spring it invades blossoms, mycelium then grows to the ovary and through the stalk to the wood (Hluchý *et al.,* 2008). Rainy and cold periods are ideal weather for this pathogen development (Holb *et al.,* 2006). Under these conditions *Monilinia laxa* can destroy a considerable part of blossoms (Gouramanis, 1999). Apricot is a thermophilic plant and the Czech Republic lies on the northern border of its growing. In spring the ideal conditions for the brown rot blossom blight development often occur here. Apricots in the Czech Republic are grown on 1200 ha, 426 ha of which are under the organic growing regime (Buchtová, 2011). For conventional and integrated production two effective substances, tebukonazol and bitertanol, are permitted (SRS, 2011). Control of brown rot blossom blight under the organic regime has not been studied yet in the Czech Republic. Therefore, in 2011, we started to test efficiency of the selected preparations permitted in organic agriculture.

Material and Methods

In 2011 a small plot experiment was established in a commercial apricot orchard in the locality of Kobylí (south Moravia, Czech Republic) where the variety Pinkot has been grown. Totally five preparations were tested (Table 1). Each variant had 3 replications (4 trees). The preparations were applied with respect to the course of weather (Figure 1 and 2) and flowering on 7/4 (BBCH 64), 11/4 (BBCH 65) and 14/4 (BBCH 66).

In addition, a semi-field experiment was conducted in the same locality with the plant resistance improver Alginure in the dose of 5 l/ha. In case of semi-field trial Alginure was applied on 1 ha block (variety Pinkot).

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Both small plot and semi-field experiments were assessed according to the EPPO 1/38(2) method on May 5. Statistical evaluations were performed using the analysis of variance and Tukey's test (α 0.05). The efficacy was determined according to Abbott's formula.

Table 1: Selected fungicides and applied doses

Preparation	Active ingredient	Dose
Alginure	algae extract 24%, plant aminoacids 7%, phosphates 20%	5 l/ha
Kocide 2000	Copper (53.8% of pure copper)	0.35 kg/ha
Kumulus WG	Sulfur (80% of poor sulfur)	3 kg/ha
VitiSan	Potassium hydrogen bicarbonate	8 kg/ha
Polisenio	Lime sulphur (380 g/l)	1%

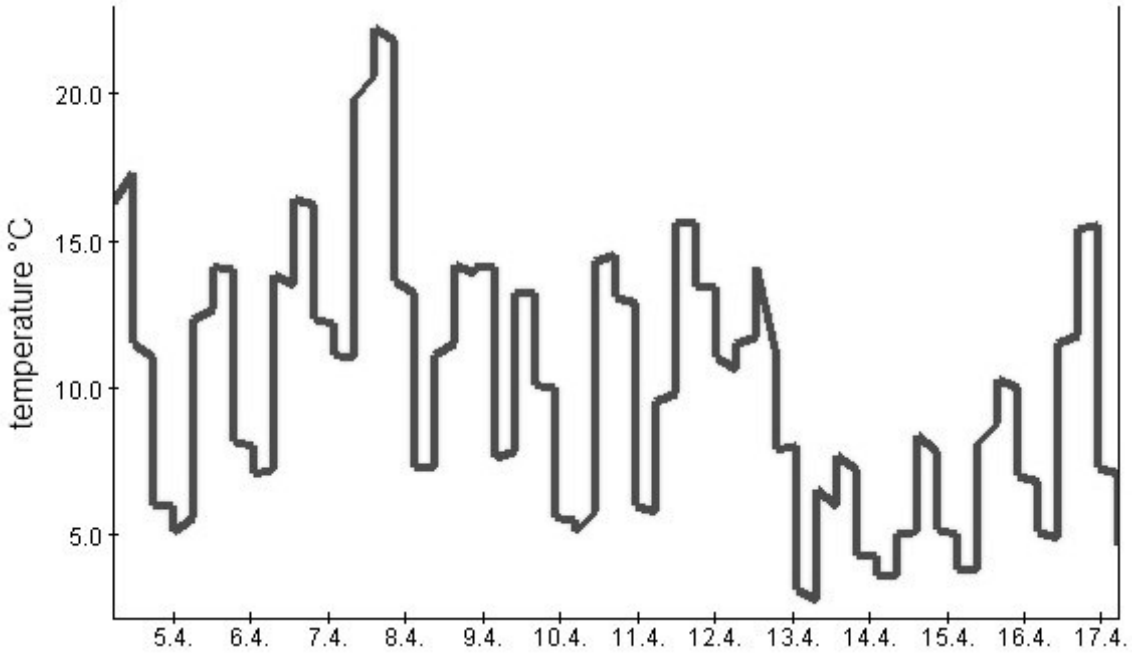

Figure 1: Course of temperatures in the selected locality of Kobylí from 4/4 to 17/4

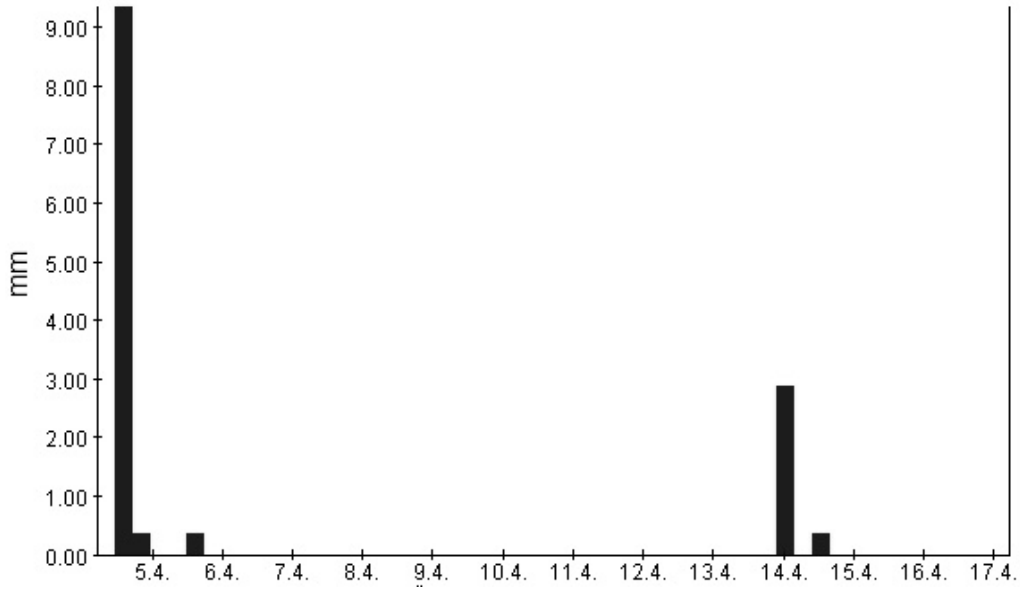

Figure 1: Rainfalls from 4/4 to 17/4 in the selected locality of Kobylí.

Results

In the small-plot trial, all treated variants differed significantly from the non-treated control (F 6.3191; P 0.000264). The infestation and efficacies determined in the individual variants are given in Table 2.

Table 2: The infestation and efficacies determined in the individual variants.

Variant	Average number of shoots infested with brown rot blossom blight in one tree	Efficacy according to Abbott %
Alginure	8.86A	63.34
Kocide 2000	8.14A	65.82
Kumulus WG	10.57A	56.21
VitiSan	8.86A	63.34
Polisenio	14.86AB	38.48
Non-treated control	24.14B	

In the semi-field trial, the efficacy of the variant Alginure was 65 % according to Abbott. This variant also differed significantly from the non-treated control (F 4.3195, P 0.007767).

Discussion

All the tested preparations significantly lowered the infestation of apricots shoots with brown rot blossom blight. The highest efficiency was achieved with the preparations Alginure and Kocide 2000 (copper). While the efficiency of copper against this pathogen had been confirmed previously (Holb, 2006), application of Alginure against brown rot in apricots was tested for the first time.

The lower efficiency of the fungicide Kumulus WG (sulphur) was probably caused by lower temperatures during the experiment (Figure 1). Generally, the effectiveness of sulphur-based fungicides is lower at temperatures below 15 °C. In Hungary where the weather is warmer, the system against brown rot blossoms blight in cherries based on sulphur and lime sulphur was formed (Holb, 2005).

Results acquired in the scope of this experiment will be used for the further development of brown rot blossoms blight control in apricots in the Czech Republic.

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