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Sprays Ineffective for Preventing Sapsucker Damage on Sugar Maple (*Acer saccharum*)

E. Thomas Smiley, Donald C. Booth, and Liza Wilkinson

Abstract. The yellow-bellied sapsucker (*Sphyrapicus varius*) is the primary cause of sapsucker damage on trees in the eastern United States. Twenty sugar maple (*Acer saccharum*) trunks were treated with repellent sprays and compared with untreated controls. Sprays applied were bitrex, methyl anthraniltate, and thiram. Sapsucker feeding damage was quantified weekly. None of the sprays were effective in reducing trunk attack by sapsucker.

Key Words. Bitrex; methyl anthraniltate; *Sphyrapicus varius;* thiram; trunk sprays; yellow-bellied sapsucker.

The yellow-bellied sapsucker (*Sphyrapicus varius*) is the primary cause of sapsucker damage on trees in the eastern United States (Ostry and Nicholls 1976). Symptoms of repeated feeding are horizontal rows of 1 cm (0.4 in) diameter and 1 cm (0.4 in) deep holes in the bark. These wounds ooze sap that the birds feed on. Although most trees do not exhibit severe decline from sapsucker attack, some studies have associated a loss of growth and crown dieback associated with severe girdling (Erdmann and Oberg 1974; Eberhardt 2000). Sapsuckers have also been found to cause damage that results in ring shake and the entrance of wood decay (Shigo 1963).

In the Piedmont area of the Carolinas, sapsucker feeding occurs between October and February. After overwintering in the Carolinas, the birds migrate north where they cause similar damage during the rest of the year.

Wrapping tree trunks with burlap or other fabric has been found to be a very effective means of preventing sapsucker damage (Smiley et al. 2007). However, this process is very time-consuming as a result of the installation and subsequent removal of the fabric. A possible alternative to wrapping is the spraying of trunks of susceptible trees with bird repellents. Although spray treatments are occasionally recommended (Messmer and Wiscomb 1998), no research findings could be found to verify the efficacy of trunk sprays. This research project was established to determine if three commonly available bird and animal repellents would be effective at reducing sapsucker damage.

MATERIALS AND METHODS

Twenty sugar maples (*Acer saccharum*) with evidence of previous sapsucker damage were selected at the Bartlett Tree Research Laboratories in Charlotte, North Carolina. Mean trunk diameter measured at 1.4 m (4.6 ft) was 21 cm (8.4 in) with a SD of 6.3 cm (2.5 in). Black electrical tape was used to mark the top and bottom of 1.8 m (5.9 ft) sections of trunks that would be treated and examined for sapsucker damage.

One of four treatments was randomly applied to each tree. The treatments were: 1) nontreated control; 2) Tree Guard® (Becker Underwood, Ames, IA)—0.2% Bitrex, ready-to-use formulation; 3) Rejex-it Crop Guardian™ (Ceannard Inc., Gastonia, NC)—14.5% Methyl anthranilate, mixed at 16 oz per gallon of water; and 4) Spotrete F™ (Cleary Chemical Co., Dayton, NJ)—42% Thiram, mixed at 1 quart in 3 quarts of water plus 8 oz ClearSpray™ (Cleary Chemical Co.).

Treatments were sprayed on the defined portion of the trunk on 15 October 2006 and 27 November 2006.

On each stem section, the numbers of "active" wounds were counted. Active wounds had exposed live phloem with no evidence of callus growth. Trees were evaluated before treatment on 15 October 2006 and after treatments were applied on 23 and 30 October; 6, 13, 20, and 27 November; 4 and 11 December; and on 29 January 2007.

Data were analyzed using an analysis of variance with separation of means using the Student Newman-Keuls procedures (SPSS, Chicago, IL; $P = 0.05$).

RESULTS

Sapsucker activity was detected within 2 weeks of the first repellant application. The number of active wounds caused by sapsuckers

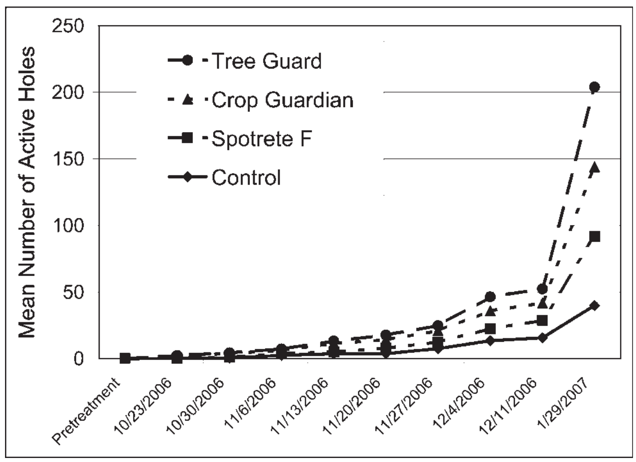

Figure 1. Total counts of active sapsucker holes in 1.8 m (5.9 ft) sections of five sugar maple trunks that were treated with a repellant treatment or left untreated. Treatments were applied on 15 October 2006 and 27 November 2006. There were no statistically significant reductions in the number of holes among any treatment and the control at any evaluation date.

Table 1. Results of analysis of variance, which compared the number of active holes for each treatment and the nontreated control at each inspection.[z]

Date of count		Sum of squares	df	Mean square	F	Significance
Pretreatment count	Between groups	4.367	3	1.456	1.873	0.175
15 November 2006	Within groups	12.433	16	0.777		
	Total	16.800	19			
23 October 2006	Between groups	9.617	3	3.206	5.585	0.008
	Within groups	9.183	16	0.574		
	Total	18.800	19			
30 October 2006	Between groups	19.300	3	6.433	5.021	0.012
	Within groups	20.500	16	1.281		
	Total	39.800	19			
6 November 2006	Between groups	10.300	3	3.433	0.839	0.492
	Within groups	65.500	16	4.094		
	Total	75.800	19			
13 November 2006	Between groups	76.317	3	25.439	1.278	0.316
	Within groups	318.483	16	19.905		
	Total	394.800	19			
20 November 2006	Between groups	25.917	3	8.639	0.542	0.660
	Within groups	255.033	16	15.940		
	Total	280.950	19			
27 November 2006	Between groups	69.350	3	23.117	0.634	0.604
	Within groups	583.450	16	36.466		
	Total	652.800	19			
4 December 2006	Between groups	73.750	3	24.583	0.343	0.794
	Within groups	1,145.450	16	71.591		
	Total	1,219.200	19			
11 December 2006	Between groups	65.417	3	21.806	0.258	0.855
	Within groups	1,353.133	16	84.571		
	Total	1,418.550	19			
Final count 29 January 2007	Between groups	1,093.267	3	364.422	0.258	0.855
	Within groups	22,631.283	16	1,414.455		
	Total	23,724.550	19			

[z]Significance was found on two dates, 23 October and 30 October, when there were more holes with the Crop Guardian treatment than all other treatments.

increased over time, peaking when the trial was terminated on 29 January 2007 (Figure 1). At no time were there any significant reductions in the number of active holes with any treatment compared with the control trees. On two dates (23 October 2008 and 30 October 20), there were significantly higher numbers of holes on the Crop Guardian treatment than all other treatments (Table 1). The total number of holes on those dates was 1.8 and 2.8, respectively, per tree for the Crop Guardian versus an average of 0.21 and 0.53 per tree for the other treatments. When feeding activity increased, all statistical differences disappeared. At the end of the trial, there was an average of 51 active holes per 1.8 m (5.9 ft) section of tree trunk.

DISCUSSION

In previous experiments, the traditional trunk wrapping treatment for sapsuckers was effective at stopping ongoing attacks and preventing new damage (Smiley et al. 2007). However, none of the three repellents used in this study during the season when sapsuckers are active showed any sign of reducing the sapsucker injury on sugar maples. This may be the result of the lack of taste or smell senses in sapsuckers during the wounding process or it may be that the sap flow from active wounds washes away the repellant. Because these birds were not feeding on the trunk while removing sections of the bark and phloem, the treatment that was applied to the bark surface may not have been ingested.

Further study is needed to find cost-effective treatments that can be applied to prevent sapsucker damage. This may involve either more effective trunk applied materials or xylem injection of repellents.

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Résumé. Le pic maculé (*Sphyrapicus varius*) est la cause primaire des dommages par les pics sur les arbres de l'Est des États-Unis. Vingt troncs d'érable à sucre (*Acer saccharum*) ont été traités à l'aide de vaporisation de répulsif et comparés avec des arbres témoins non traités. Les répulsifs étaient le bitrex, l'anthraniltate de méthyle et le thiram. Les dommages par l'alimentation du pic ont été quantifiés hebdomadairement. Aucun des produits utilisés ne s'est avéré efficace pour diminuer les dommages au tronc par le pic.

Zusammenfassung. Der Gelbbauch-Saftlecker ist der Hauptgrund für Saftleckerschaden an Bäumen in den östlichen Vereinigten Staaten. Zwanzig Zuckerahornstämme wurden mit Abwehrmitteln besprüht und mit unbehandelten Kontrollbäumen verglichen. Die verwendeten Mittel waren Bitrex, Methylanthraniltat und Thiram. Der Saftleckerschaden wurde wöchentlich quantifiziert. Keins der verwendeten Mittel konnte die Attacken der Saftlecker erfolgreich abwehren.

Resumen. El succionador amarillo (*Sphyrapicus varius*) es la causa primaria de daño por succionadores en árboles en el este de los Estados Unidos. Se trataron 20 troncos de maples azucareros (*Acer saccharum*) con espráis repelentes y fueron comparados con controles no tratados. Los espráis aplicados fueron bitrex, methyl anthraniltate, y thiram. El daño por alimentación del succionador fue identificado semanalmente. Ninguno de los espráis fue efectivo en reducir el ataque al tronco por el succionador.