

Study Title

Painting eaves to deter paper wasp nesting, *Polistes carolina* (Linnaeus) (Hymenoptera: Vespidae)

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Performing Laboratory

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NPMA Pest Management Foundation

I the undersigned, hereby declare that this study was performed under my supervision according to the procedures herein described, and that this report provides true and accurate record of the results obtained.

Principal Investigator

Date

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Table of Contents

	Page
Title Page.....	1
Table of Contents.....	2
General Study Information.....	3
1.0 Abstract.....	4
2.0 Introduction.....	4
3.0 Materials and Methods.....	5
4.0 Results	5
5.0 Discussion.....	5
6.0 Tables.....	6
7.0 Figures.....	6
8.0 Literature Cited.....	8

General Study Information

This test was initiated in the spring of 2009 to evaluate the reduction of paper wasp nests on eaves after painting with light blue oil based paint.

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Test Substance

Glidden Ultra-Hide 3517 Oil Semi-gloss paint in Celestial Blue

Study Execution Dates

Study Experimental Date:	March 5, 2009
Study Experimental Termination Date:	October 7, 2009
Final Report Date:	November 20, 2009

Abstract:

Paper wasps are responsible for numerous stinging incidents reported to healthcare professionals and pest management professionals in North America every year, making them a medically important group of insects. Current methods for treating paper wasp nesting sites rely heavily on chemicals. In 2008, we evaluated a new technique of painting overhead eaves a light blue to prevent paper wasp nesting. At the conclusion of this study, there were no paper new nests on the painted eaves. As a result, we expanded the project in 2009. Overall, there were fewer paper wasp nests found on the painted eaves. At the one month observation, there were significantly fewer paper wasp nests found on eaves painted in both 2008 and 2009. Also at the two and three month observations, there were fewer paper wasp nests found on the painted eaves compared to the unpainted eaves, even though no significance was found.

Introduction:

Every year, paper wasp stings by *Polistes carolina* are reported at schools, businesses and homes across North America, sometimes resulting in life threatening situations. These wasps often nest near occupied structures, which place them close to human activity (Akre 1995, Greene 2003). Nests commonly occur along eaves of structures, but they can also be found within structures and plants. They are commonly found near sites of food, such as trash receptacles and they are a particular problem in late summer and autumn when their colonies peak in size (Akre et al. 1980). Since wasps are a medically important group of insects, chemical control measures are usually taken to decrease populations. However if we could use non-chemical control options to decrease paper wasp populations or prevent them from nesting, we would have a more environmentally friendly control option and a great tool in an IPM plan.

The current method of treatment at the Girl Scout Camp Bette Perot in Palestine, TX is annual applications of Tempo® 1% Dust (1% cyfluthrin) in early spring to all structures on the camp property to reduce *Polistes carolina* populations. However, the use of non-chemical control methods is preferred for the control of paper wasps by the Girl Scout Camp board. In May 2008, one non-chemical control method was evaluated. The eaves of three unit shelters at the Girl Scout Camp Bette Perot in Palestine, TX were painted light blue. The theory behind painting the overhead eaves a light blue is to mimic the sky so the paper wasps are confused into thinking the eaves are the sky, so they will not construct nests along the painted areas. The eaves were then observed on June 4th, July 5th, September 1st, 8th, 15th and 22nd and there were no new wasp nests along the painted eaves. If light blue paint is effective at preventing paper wasps from nesting, this would be a new technique that would provide an environmentally friendly and profitable service to pest management professionals for controlling paper wasp populations around homes, businesses, daycare centers, schools, nursing home centers and hospitals. Based on the results of 2008, four new cabins were painted and evaluated in 2009.

Materials and Methods:

On March 5, 2009, eight sleeping cabins were chosen at Girl Scout Camp Bette Perot in Palestine, TX. The number of wasp nests were counted and removed from the cabins (Figure 1). The total number of nests were blocked and arrayed from the highest to the lowest mean number and then treatments were randomly assigned within each replication. Four of the eaves of the sleeping cabins were painted with Glidden Ultra-Hide 3517 oil semi-gloss paint in celestial blue March 5, 2009 from 9am-1pm (Figures 2 and 3). Also, the number of wasp nests found on the two unit shelters that were painted in 2008 was evaluated in this study. At each monthly observation on April 5th, May 5th, June 5th, July 1st, August 4th, September 3rd, and October 7, 2009, new paper wasp nests were counted and removed from the eaves of all ten buildings. Data were analyzed using SPSS Analysis of Variance (ANOVA) test with means separated using Duncan's Multiple Range Test at $P \leq 0.05$ (SPSS for Windows, Lead Technologies, Version 13.0).

Results

Results of paper nest are shown in Table 1. At the one month observation, the newly painted eaves had significantly fewer paper wasp nests compared to the other treatments; the eaves painted in 2008 had significantly fewer paper wasp nests than the unpainted eaves. At the two and three month observations, there were fewer paper wasp nests on the painted eaves compared to the unpainted eaves even though no significance was found. On the June 20th and 21st, there were numerous stings from paper wasps so the camp management staff felt the need to treat all the buildings with Tempo® 1% Dust (1% cyfluthrin). As a result of this treatment, the paper wasp population around all of the buildings was very low for the 4, 5, 6 and 7 month observations, with no significant differences found between the painted and unpainted eaves.

Discussion

Overall, there were fewer paper wasp nests found on the painted eaves. At the one month observation, there were significantly fewer paper wasp nests found on the eaves painted in both 2008 and 2009. Also at the two and three month observations, there were numerically fewer paper wasp nests found on the painted eaves compared to the unpainted eaves. Since there were so many paper wasp stings reported in June, chemical controls were used around all of the buildings. If these chemicals were not used, perhaps we could have evaluated the painted eaves more conclusively.

Another trial is planned in 2010 to evaluate latex paint in celestial blue to determine if the oil within the paint is having a repellency effect on the wasp nesting. The data from all 3 years will then be compiled and submitted to pest management magazines and scientific journals for possible publication. The ultimate goal is to provide a new, environmentally friendly technique to reduce current paper wasp populations, which would be a great tool to a current IPM plan.

The average daytime temperature throughout the study was 85°F with a total of 30 inches of rain.

6.0 Table

Table 1. Number of paper wasp, *Polistes carolina*, nests found on the eaves of shelters and cabins at pretreatment and at each monthly observation post treatment in Palestine, TX.

Treatment	Pretreatment	1 Month	2 Months	3 Months	4 Months	5 Months	6 Months	7 Months
Painted 08	0.00a	3.00b	1.00a	0.50a	0.00a	0.00a	0.00a	0.00a
Painted 09	7.00a	0.25a	0.25a	0.25a	0.00a	0.00a	0.00a	0.00a
Control	6.50a	5.25c	2.00a	2.00a	0.00a	0.50a	0.00a	0.00a
<i>df</i>	2	2	2	2	2	2	2	2
<i>F value</i>	2.20	23.38	2.00	2.55	0.00	0.70	0.00	0.00
<i>Significance</i>	0.18	0.001	0.21	0.15	0.05	0.53	0.05	0.05
<i>Mean Square</i>	36.70	25.05	3.08	3.38	0.00	0.30	0.00	0.00

^aMeans followed by the same letter within the same column were not significantly different using Analysis of Variance (ANOVA) and means separated using Duncan's Multiple Range Test at $p \leq 0.05$ (SPSS, Windows 11.5).

7.0 Figures

Figure 1. Paper wasps nesting outside of a sleeping cabin at Girl Scout Camp Bette Perot, Palestine, TX.



Figure 2. Painted eaves of unit shelters celestial blue to deter wasps from nesting at Girl Scout Camp Bette Perot, Palestine, TX.



Figure 3. Painted eave of sleeping cabin painted celestial blue to prevent paper wasps from nesting at Girl Scout Camp Bette Perot, Palestine, TX.



8.0 Literature Cited:

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- Greene, A. 2003. Born to gnaw. *Pest Control Technology*. 31: 49-56.