

PUBLIC ATTITUDES ON RED IMPORTED FIRE ANT (HYMENOPTERA: FORMICIDAE) INFESTATIONS IN HOMES AND RECREATIONAL AREAS

L. A. Lemke¹ and J. B. Kissam

Department of Entomology

Clemson University

Clemson, SC 29634-0365

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ABSTRACT

A survey of South Carolina residents conducted between 1983 and 1985 solicited opinions on the red imported fire ant (RIFA), *Solenopsis invicta* Buren and its control. Eighty-seven percent of the 430 respondents felt they had a severe RIFA problem on their property and a similar proportion (89%), reported having had one or more members of their immediate family stung by RIFAs. Control measures were taken by 74% of the respondents. A survey of 55 pest control companies revealed that 97% received calls in 1984 concerning the RIFA. Eighty-two percent of these companies offered a service to control RIFAs in yards.

Key Words: Red imported fire ant, *Solenopsis invicta*, pest control, residential

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INTRODUCTION

The red imported fire ant (RIFA), *Solenopsis invicta* Buren (Hymenoptera: Formicidae), inhabits over 90-100 million ha from Texas to North Carolina (Apperson and Adams 1983). Considerable difference of opinion exists as to the actual impact of the RIFA. Some researchers have reported the detrimental effects of RIFAs on crops, livestock and wildlife (Travis 1938, Lyle and Fortune 1948, Adams et al. 1976, 1977, 1983, Lofgren and Adams 1981, Smittle et al. 1983, Adams 1983, Apperson and Powell 1983). Others have documented its value as a beneficial predator (Reagan et al. 1972, Summerlin et al. 1977, Sterling 1978, McDaniel and Sterling 1979, Krispyn and Todd 1982, Schmidt 1984).

The lay public's perception of the RIFA is yet another matter. More people in the southeastern United States are stung by RIFAs each year than by bees, hornets, wasps, and yellow jackets collectively (Shealey 1983). A 240 family, Louisiana telephone survey by Clemmer and Serfling (1975) indicated that 28.6% of the individuals in these families experienced stings in the summer months, 4.4% sought medical assistance. Eighty-four percent of 667 families surveyed in Mississippi reported having had some member of their immediate family stung by RIFA at one time or another (Weidner 1982). Yeager (1978) indicated that only 4.5% of 483 persons interviewed in Lowndes County, GA, required medical attention for RIFA stings. A similar survey in Sumter County, GA, conducted by Adams and Lofgren (1981) found that approximately 31% of the 254 individuals (62 families) reported having been stung at least once during the year. The highest sting rate (50%) occurred in persons under 20 years of age and this rate declined as age increased. Rhoades et al. (1977), in a survey of allergists in Jacksonville, FL, found that

¹ Present Address: Ciba Geigy Corp., 678 Reba Road, Landing, NJ 07850.

systemic allergic reactions to RIFA stings among the population were approximately 3.8 per 100,000 individuals. Lawrence et al. (1973) surveyed 1020 physicians in South Carolina, of 1088 persons treated for RIFA stings from 1970 to 1972, only 69 (6.3%) involved anaphylactic shock. Adams and Lofgren (1982) examined the medical records of 329 patients from Fort Stewart, GA. They found that edema (81%) and urticaria (51%) were the most common reactions, 7.1% suffered from severe respiratory distress. In a survey of 113 people in suburban New Orleans, 58% reported having been stung while only 9 individuals had severe reactions (DeShazo et al. 1984a, b).

Paull (1984) estimated from published literature that 16% of all individuals stung seek medical help for systemic reactions, of which 0.61% experience a generalized systemic anaphylaxis. Adams (1986) determined from Paull's estimates that 67 to 85 thousand individuals per year require the care of physicians and/or emergency treatment for anaphylaxis.

This study collected data on control practices in current use and on perceptions of the RIFA problem in areas where most respondents were suburban or urbanite. In addition, a survey of pest control companies in infested counties was also conducted in order to collect information on the role companies play in dealing with RIFAs in residential areas.

MATERIALS AND METHODS

Public surveys. A three-page, 22 question survey was administered by L. A. Lemke through directed interviews at public gatherings. A booth was set up at each site which provided information on biology and control of the RIFA. Persons walking by the booth were asked to fill out a survey and a tally of those willing to participate versus those refusing to respond was recorded.

Data were collected at the following locations: South Carolina State Fair, Columbia; Plant Problem Clinic, Myrtle Beach; Dillon County Extension Meeting; Seminars in Science, University of South Carolina, Aiken campus; Sumter County Fair; and Lower Coastal Fair.

Pest Control Surveys. A two-page, 15 question survey was used to examine the relationship between RIFA control and pest control companies. Surveys were distributed to membership at the annual meeting of the South Carolina Pest Control Association.

Data analysis was handled in the same manner for both surveys. Descriptive statistics (% response \pm SE) were calculated for some of the data. Analysis by chi square ($P \leq 0.05$) was applied to determine if there was a significant relationship between the responses to some of the questions.

RESULTS AND DISCUSSION

Public Survey. Of the 796 individuals who were asked to respond to the questionnaire, 430 (54%) agreed to participate. The respondents represented 430 different families. Approximately 60% came from three counties: Richland, Lexington and Horry. Since the majority of respondents were from 1 of 3 counties, it is impossible to assume that their responses reflect the populace of other areas of the state. The majority of the respondents were male (57%), had children (75%), owned their own homes (86%), were between the ages of 30 to 39 (37%), lived in a suburban setting (38%), and spent 5 hours per day or less outdoors (65%). In

addition, 49% of all respondents held some type of college degree, and 32% of respondents had a gross annual income of \$20,000 to \$30,000 per year.

Eighty-nine percent of the respondents reported having had someone in their immediate family stung by a RIFA (Table 1). Of the respondents, 44% reported that the sting resulted in a classic white pustule described by Lockey (1974). An interesting statistic dealt with whether or not someone in the immediate family had seen a doctor in regards to a RIFA sting. Sixteen percent reported that a family member had been to a doctor due to a RIFA sting. Reactions to stings that had caused them to seek professional help ranged from discomfort with itching to anaphylactic shock.

Table 1. Survey results regarding the effect of the red imported fire ant (RIFA) on families (Percent response \pm SE).

Q. Has anyone in your immediate family been stung by the RIFA?
A. Yes - 89% \pm 2.9; no - 11% \pm 2.9
Q. If yes, when stung, what was the reaction?
(could answer more than once)
A. Slight itch with red spot (few hours) - 29% \pm 3.5; intense itching and white pustule (few days) - 44% \pm 3.9; intense swelling (lasting a week or longer) - 16% \pm 2.9; reaction requiring immediate attention - 9% \pm 2.2; no reaction - 2% \pm 1
Q. Have you or any member of your immediate family seen a doctor in regards to a RIFA sting?
A. yes - 16% \pm 3.5; no - 84% \pm 3.5

Eighty-seven percent considered the RIFA to be a serious problem on their property (Table 2). When asked what they considered to be the major problem associated with the RIFA, 29% felt they were a nuisance and 34% saw RIFAs as a threat to their children. Most respondents (68%) felt that the problem was getting worse. Fifty-one percent were less tolerant of the RIFA on their on land than in public areas and the majority of residents said they were willing to pay more at recreational facilities if the RIFA was controlled. Small sample size made it unrealistic to conclude whether families were changing their outdoor activities in response to the RIFA. There was a direct relationship between a change in outdoor activities and whether the respondent felt the problem had stayed the same, gotten worse or better on their property in the last 3 years ($\chi^2 = 61.062$, $\alpha = 0.05$ with 2 df). The majority of people (61%) who reported that the problem had gotten worse had reduced their outdoor activities in response to RIFAs. However, a majority of people (79%) reporting that the problem had stayed the same or had gotten better did not change their outdoor activities.

Questions regarding RIFA control shed light on the public sector's responsibility and treatment patterns. Fifty-four percent of the respondents felt that the individual treatment of mounds with insecticide solutions was the most effective way to control RIFAs (Table 3). When asked who should pay for this control 67% felt that the government (either federal, state or county) should be responsible for control. However, only 45% were willing to pay more in taxes for widespread RIFA control programs instituted by the government. A direct relationship existed between whether a respondent was willing to pay more in taxes and their income level ($\chi^2 = 25.293$, $\alpha = 0.05$ with 4 df). Sixty-six percent of the families who made

\$30,000 or more in gross income per year were willing to pay more in taxes for RIFA control programs, while only 40% who made less than \$30,000 were willing to pay more.

Table 2. Survey results concerning public opinion on the red imported fire ant (RIFA) problem by 430 residents (Percent responses \pm SE).

Q. Do you consider the RIFA a serious problem on your property?
A. Yes - 87% \pm 3.2; No - 13% \pm 3.2
Q. What do you consider to be the major problem associated with the RIFA? (N = 829, could answer more than once)
A. Nuisance - 29% \pm 3; threat to children - 34% \pm 3.2; threat to pets - 19% \pm 2.7; fear of ants - 5% \pm 1.1; invade house - 5% \pm 1.1; gives bad appearance to property - 8% \pm 1.7
Q. Has the problem become worse, better or stayed the same in the last three years?
A. Same - 28% \pm 4.2; worse - 68% \pm 4.4; better - 4% \pm 1.8
Q. Has the RIFA caused you to change how you conduct your outdoor activities?
A. Yes - 48% \pm 4.7; no - 52% \pm 4.7
Q. Are you more tolerant of the RIFA on your property than in public recreation areas?
A. Yes - 21% \pm 3.8; no - 51% \pm 4.7; equally tolerant in both areas - 28% \pm 4.2
Q. Would you prefer to go to a recreational area where the owner pays for RIFA control but charges more to cover the cost?
A. Yes - 56% \pm 4.7; no - 14% \pm 3.3; doesn't matter - 28% \pm 4.5; will go where it's cheaper - 2% \pm 1.3

Table 3. Survey results concerning attitudes toward control of the red imported fire ant (RIFA) by 430 residents (Percent response \pm SE).

Q. What do you think is the best way to control the RIFA?
A. Mound treatment with insecticide solutions - 54% \pm 4.8; wide aerial application of chemicals (government or private) programs - 21% \pm 3.9; using baits for mound treatments - 19% \pm 3.8; other - 6% \pm 2.3
Q. Who do you think should pay for control of RIFAs?
A. Federal government - 24% \pm 3.5; state government - 25% \pm 3.5; county governments - 18% \pm 3.1; individuals - 31% \pm 3.8; other - 2% \pm 1.1
Q. Would you be willing to pay more in property taxes for widespread RIFA control practices?
A. Yes - 45% \pm 4.8; no - 55% \pm 4.8

Seventy-four percent of the respondents had applied control measures for RIFAs on their property (Table 4). Of these, 35% used mound drenching. Fifteen percent used materials other than insecticides; of these 80% used gasoline to control the ants. One individual reported that he sprayed the mound with clear paint.

The majority of respondents (57%) were willing to pay \$10.00 to \$30.00 a year for RIFA control. However, the amount they were willing to spend was related to their income level ($\chi^2 = 34.561$, $\alpha = 0.05$ with 8 df). Twenty-six percent of the respondents who made over \$30,000 a year were willing to pay more than \$30.00

annually for RIFA control. Only 9% of the respondents who made \$30,000 or less a year were willing to spend over \$30.00 a year for control.

Control of RIFA by Pest Control Operators. Fifty-five pest control companies were asked to respond to the survey distributed at their annual professional meeting held in February 1985. Of those companies, 69% participated.

Table 4. Survey results regarding control methods used and amount spent for red imported fire ant (RIFA) control by 430 residents (Percent responses \pm SE).

Q. Have you ever applied control measures for RIFA control on your property?
A. Yes - 74% \pm 4.2; no - 26% \pm 4.2
Q. If you have applied control measures, what application methods did you use?
A. Baits - 29% \pm 4.6; inject chemical in mound - 21% \pm 4.1; mound drenching with insecticide solution - 35% \pm 4.9; other - 15% \pm 3.7
Q. How much are you willing to spend (on an annual basis) to control ants on your property?
A. None - 4% \pm 1.9; \$1.00 to \$10.00 - 22% \pm 4.3; \$10.01 to \$30.00 - 57% \pm 4.9; more than \$30.00 - 17% \pm 3.7

Ninety-seven percent of the responding companies reported receiving at least one call a year concerning RIFAs. Thirty-eight percent of the companies received 1 to 24 calls last year (1984), while 36% of the companies received 25 to 50 calls. The remaining 26% received over 50 calls during the year.

Eighty-two percent of the companies offered a service to provide RIFA control in yards (Table 5). Thirty-two percent of the companies charged \$75.01 to \$100.00 for the service and many of the companies stated that they did not guarantee 100% control. The chemical most often used for control of RIFA colonies in yards was chlorpyrifos (60%).

Table 5. Survey results concerning control of the red imported fire ant (RIFA) in yards by pest control companies (Percent responses \pm SE).

Q. Does your company offer a service to control fire ants in yards?
A. Yes - 82% \pm 12.2; no - 18% \pm 12.2
Q. What is the total cost for such a contract?
A. \$0.00 to \$25.00 - 10% \pm 9.5; \$25.01 to \$50.00 - 16% \pm 11.7; \$50.01 to \$75.00 - 19% \pm 12.4; greater than \$75.01 - 43% \pm 15.7; unanswered - 12% \pm 10.7
Q. How often does servicing of this type account take place?
A. Once - 40% \pm 15.6; weekly - 7% \pm 8.1; monthly - 13% \pm 10.7; other - 40% \pm 15.6
Q. What chemicals are used for control in yards?
A. Dursban - 60% \pm 14.8; diazinon - 18% \pm 11.7; Whitmire PT - 270 - 9% \pm 9.1; Amdro - 6% \pm 7.7; Cessco Accudose Aerosol - 4% \pm 6.6; malathion - 3% \pm 5.9

Sixty-six percent of the companies had been asked to provide RIFA control inside of homes (Table 6). Eighty-one percent of these companies treated for RIFAs in the home as they did for other ants, while the other 19% stated that they tried to locate the colony outside and treat it as well. Thirty-two percent of the companies charged less for control in homes than in yards, with the cost being between \$50.00 to \$75.00. As was the case with yard control, chlorpyrifos was the most widely used chemical (56%).

Table 6. Survey results concerning control of red imported fire ants (RIFA) in homes by pest control companies (Percent responses \pm SE).

Q. Has your company ever been called in to control fire ants in homes?
A. Yes - 66% \pm 15.1; no - 34% \pm 15.1
Q. How many times have you been called by residents concerning the presence of RIFAs in their home (in the last year)?
A. 1 to 10 - 85% \pm 11.4; 10 to 25 - 4% \pm 6.2; 26 to 50 - 8% \pm 8.6; greater than 50 - 3% \pm 6.2
Q. What is the cost to service for RIFAs in a house?
A. \$0.00 to 25.00 - 20% \pm 12.7; \$25.01 to \$50.00 - 28% \pm 13.7; \$50.01 to \$75.00 - 32% \pm 14.8; greater than \$75.00 - 16% \pm 11.7; unanswered - 4% \pm 6.2
Q. How often does the servicing take place?
A. Once - 38% \pm 15.3; weekly - 9% \pm 8.6; monthly - 21% \pm 12.7; other - 29% \pm 14.3; unanswered - 3% \pm 4.5
Q. What chemical is used for control of RIFAs in homes?
A. Dursban - 57% \pm 15.7; diazinon - 15% \pm 11.4; Ficam - 15% \pm 11.4; Whitmire PT-270 - 11% \pm 9.9; Orthene - 2% \pm 4.5

Results of this study provided some insight into attitudes that residents have regarding the RIFA problem. The RIFA has created dissatisfaction, concern and confusion among citizens. Many residents want total eradication of the RIFA and have little understanding of the improbability of this being accomplished. There is considerable need for education about the RIFA and available control alternatives. Our citizenry might gain much needed perspective if information comparing the RIFA to other medically or pestiferous insects and arthropods became common knowledge. We also need to look at the role of the pest control industry in dealing with the RIFA.

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