Integrating Prescribed Burning and Insecticide to Reduce Fire Ant Impacts on Bobwhite Chicks

Principal investigator:
Dr. C. Brad Dabbert
Dept. of Range, Wildl. and Fish. Mgmt.
Box 42125, Texas Tech University
Lubbock, TX 79409
Phone: 806/742-1983: Fax: 806/742-2280
Email: Brad.Dabbert@ttu.edu

Co-investigator:
Dr. Rob B. Mitchell
USDA-ARS, University of Nebraska-Lincoln, Lincoln, NE 68583-0937

Funding amount/2 Years: $69,335

Summary of Work to be Done:
Our objective is to determine if a reduced rate of insecticide and/or a combination of prescribed burning and a reduced rate of insecticide can reduce the foraging activity of red imported fire ants (RIFA) below the threshold that causes mortality of northern bobwhite chicks. At least four 150 x 300 m study sites will be established and divided into two 150 x 150 m plots. One plot within each site will be randomly chosen for prescribed burning treatment. After burning, burned and nonburned plots within each site will be stratified to create four 75 x 75 m subplots within burned and nonburned plots. Subplots will then be randomly chosen to receive one of four rates of insecticide treatment: 0, 25, 50, or 100% of the recommended label rate of Amdro®. Insecticide will be applied to a 60 x 60 m core area within each subplot. Treatments will be replicated at 4 sites. Efficacy of treatments on RIFA foraging activity in the core area within each subplot will be assessed using a bait cup method. Bait cup sampling will be conducted immediately prior to, and 4 weeks, 8 weeks and 12 weeks after insecticide treatment. Differences in RIFA foraging activity among treatments will be assessed using a 3 factor (burning treatment, insecticide treatment, and year) repeated measures analysis of variance. Differences among individual means will be determined using LSD. Treatments will be initiated in 2002 and repeated in 2003 on previously nontreated sites

Major Accomplishments to Date:
- Marked and applied burned treatments to 8 study plots exceeding our goal of 4
- Applied Amdro treatments to plots

Goals Achieved:

- Project is on schedule
- Two bait cup samplings completed (one pretreatment and one post-insecticide treatment)
- Graduate and undergraduate students trained

Relevance to the Texas Imported Fire Ant Research and Management Project:
The Texas Imported Fire Ant Research and Management Plan identified interference of hunting activities and the reduction of game species as negative impacts of the RIFA on human utilization of wildlife. A major goal of the plan is to develop methods to reduce RIFA impact on wildlife. Current methods available to reduce RIFA foraging activity in wildlife habitat, such as insecticide treatments, are not economically or environmentally desirable for most landowners. Our project will identify a reduced rate of insecticide and/or a combination of prescribed burning and a reduced rate of insecticide that will reduce the foraging activity of RIFA below the threshold that causes mortality of northern bobwhite chicks. Use of less insecticide will provide landowners with a more economically feasible and possibly environmentally friendly way to reduce the impacts of RIFA on northern bobwhite. This approach should benefit landowners, the industry, and the public as well. Landowners should be able to maximize profits from hunting leases by increasing northern bobwhite populations while expending much less treatment expense than previously required. Industry, though they may sell less product per landowner, should benefit by the addition of many new landowners who can now afford to pay for an effective amount of product for which they previously could not afford. Finally, the public should benefit by the increased northern bobwhite resource available as a result of increased RIFA control throughout the state.

Publication submitted/published; presentations/posters presented at national technical meetings/conferences:

Publications:

Forbes, A. R., C. B. Dabbert, R. B. Mitchell, and J. M. Mueller. 2002. Does habitat management for northern bobwhite benefit the red imported fire ant? In Stephen J. DeMaso, William P. Kuvlesky, Jr., and Fidel Hernandez, eds. Quail V: Proceedings of the Fifth National Quail Symposium, Texas Parks and Wildlife Department, Austin, TX.

Mueller, J. M. and C. B. Dabbert. 2002. Relationship between plasma triglycerides, body mass, and reproduction of northern bobwhites. In Stephen J. DeMaso, William P. Kuvlesky, Jr., and Fidel Hernandez, eds. Quail V: Proceedings of the Fifth National Quail Symposium, Texas Parks and Wildlife Department, Austin, TX.

= =

Economic Cost and Benefits of Integrating Prescribed Burning and Insecticide to Reduce Fire Ant Impacts on Bobwhite Chicks

Principal Investigator: David B. Willis

Funding Amount/2 Years: $26,078

Summary of Work to be Done:
The objective of this research is to determine the economic cost and benefit of controlling Red Imported Fire Ant (RIFA) infestations on Bobwhite Quail habitat in Texas. Data from two on-going mail surveys is being collected. Two thousand surveys have been mailed to Texas Quail Hunters. The survey data collected will be used to document the economic cost RIFA infestations impose on quail hunters. A second mail survey was sent to 300 quail lease providers for purposes of determining the impact RIFA infestations have on the operation, management, and economic value of quail hunting property. Collectively, the data from these two surveys will provide four important pieces of economic information. First, the data will provide a means to accurately establish the economic value of the quail hunting industry to Texas. Second, the survey will allow us to document the statewide magnitude of the annual economic damage fire ant activity imposes on the Texas quail industry. Third, it will provide a means to identify areas of the state where quail populations are most susceptible to fire ant infestations. Fourth, the economic results will be used to determine the economic efficacy of integrating prescribed burning and insecticide to reduce Bobwhite Chick losses due to RIFA. Dabbert and Mitchell (Department of Range, Wildlife, and Fisheries Management, Texas Tech University) are using field experiments to determine the control effectiveness of a combination of prescribed burning and insecticide (Amdro) applications at less than labeled application rate to control RIFA infestations. Development of a cost-effective control technology will enhance the ability of wildlife managers to protect economically significant quail habitat from RIFA infestations.

Major Accomplishments to Date:
Separate mailing lists for quail hunters and landlords who lease there lands to quail hunters have been compiled. Two survey instruments, one for landowners who lease their land to quail hunters, and another for quail hunters have been developed and pretested. The first wave of a three tier mail survey has been sent to each survey population. Surveys are being electronically coded as they are returned.

Relevance to the Texas Imported Fire Ant Research Management Project:
Polk et al. (1999) estimated that the value of quail lost to RIFA activity ranges between $3 and $36 million annually. Despite this significant economic cost, the high cost of applying Amdro, and other insecticides, at the recommended label rate to protect quail habitat from RIFA has discouraged the widespread adoption of insecticide control measures. Recent field work by Mueller et al. (1999) found that quail chick survival is virtually zero when 300 or more RIFA are recruited to a nest within one day of hatching, but chick mortality drops significantly at lower RIFA levels. Thus, it might be possible to receive significant economic benefits from partial RIFA control without incurring the cost of a 100 percent RIFA eradication program by applying insecticide at less then the labeled application rate.

Products; publications submitted/published; presentations/posters presented at state and national technical conferences:
Results will be published and/or presented in the appropriate outlets once the data is compiled and statistically analyzed.