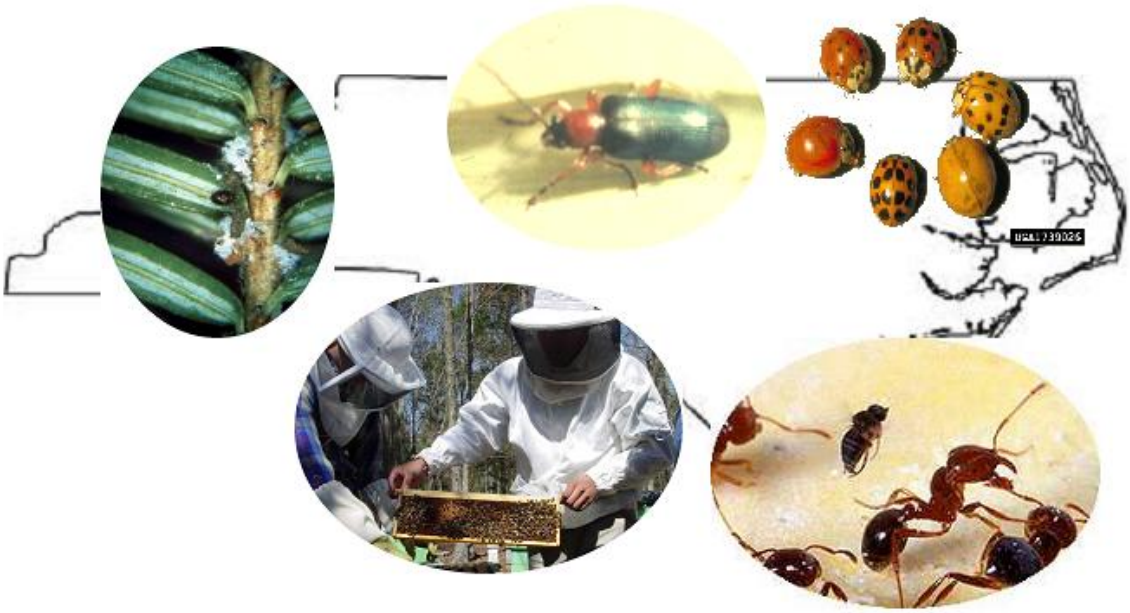
Annual Report of Activities

2003 - 2004



Beneficial Insects Laboratory

North Carolina Department of Agriculture and Consumer Services

2003-2004 REPORT OF ACTIVITIES

Beneficial Insects Laboratory
Plant Protection Section
North Carolina Department of Agriculture and Consumer Services
1060 Mail Service Center
Raleigh, NC 27699-1060

http://www.ncagr.com/plantind/index.html

Introduction

This report is a summary of the projects undertaken by the Beneficial Insects Laboratory (BIL) of the Plant Industry Division of the North Carolina Department of Agriculture and Consumer Services during the years 2003 and 2004. The BIL addresses two programs, biological control and apiary inspection. The Biocontrol program implements classical biological control projects, in which the natural enemies of pest insects and weeds are released in the environment with the goal of stabilizing pest populations below their economic threshold. The Apiary Inspection program is designed to maintain a viable bee and honey industry in North Carolina through inspection for mites, diseases, and other hive pests.

The insects featured on our cover this year are representative of the diversity of our biocontrol and apiary inspection programs, geographically and biologically. Depicted from left to right, hemlock wooly adelgid, top center- cereal leaf beetle, bottom-center- Apiary inspector, top right - *Harmonia axyridis* (photo: Bill Ree, Texas A&M Univ., www.forestryimages.orgT), bottom right - phorid fly attacking red imported fire ants, (USDA photo).

USDA-APHIS, ARS, and Forest Service, as well as the Cooperative Extension Service, faculty, and staff of North Carolina State University all played roles in the implementation of our programs during 2003-2004. We are grateful for the cooperation of other members of the NCDA Plant Protection Staff, including Support Services, and the statewide field staff under the supervision of Dan Wall.

Implementation of our 2003-2004 programs included release of approximately 31,000 beneficial insects; the lab personnel reared some, others originated from out-of-state. Cooperative work with USDA-APHIS for cereal leaf beetle continued, as well as studies on the biology of the adventive predator *Harmonia axyridis*.

The Quarantine Facility housed at the laboratory has been used by our personnel, entomologists from NCSU, and by the Museum of Natural Sciences. Rebecca Norris currently serves as the Quarantine Officer, and welcomes inquiries about the facility.

Two papers were published by BIL personnel during 2003-2004:

Perry, J., Nalepa, C. A. 2003. A new mode of parental care in cockroaches. Insectes Sociaux 50 (3): 245-247.

Nalepa, C.A., G.G. Kennedy and C. Brownie 2004. Orientation of multicolored Asian lady beetles to buildings. American Entomologist 50(3): 165-166.

The personnel of the BIL during 2003-2004 were:

Dr. Kathleen Kidd, Biological Control Administrator
Dr. Christine Nalepa, Laboratory Research Specialist
Mrs. Rebecca Norris, Ag. Res. Tech II & Quarantine Officer
Mrs. Phyllis Straughn, Office Assistant

Ms Janet Griffiths, Ag. Res. Technician
Ms Jessica Bridges, Ag. Res. Technician
Mr. Mike Gusefski, Ag. Res. Technician
Mrs. Karin Hess, Ag. Res. Technician
Ms April Johnson, Ag. Res. Technician
Mrs. Dawn Ponder, Ag. Res. Technician

Personnel of the Apiary Inspection Program were:
Mr. Donald Hopkins, State Apiarist and Apiary Inspection Supervisor
Mr. Glenn Hackney, Agricultural Research Technician
Mr. Will Hicks, North Central Piedmont Area Apiary Inspector
Mr. Adolphus Leonard, Eastern Area Apiary Inspector
Mr. William Sheppard, Sandhills Area Apiary Inspector
Mr. Richard Lippard, Western Piedmont Area Apiary Inspector
Mr. Jack Hanel, Mountain Area Apiary Inspector

A table of contents follows.
K.A. Kidd, C.A. Nalepa, and R. S. Norris
Editors
15–II-05

TABLE OF CONTENTS

Records of Beneficials Released during 2003-2004

DATE	HOST	BENEFICIAL	#	SOURCE	RELEASE LOCATION
June 03	Fire Ant	*Pseudacteon tricuspis*	3849	USDA-ARS, Gainesville, FL	Robeson County
June 04	Fire Ant	*Pseudacteon tricuspis*	4962	USDA-ARS, Gainesville, FL	Wayne County
Spring 03	HWA*	*Sasajiscymnus tsugae*	~6000	NCDA & CS BIL	Various, western NC
Spring 04	HWA*	*Sasajiscymnus tsugae*	~20000	NCDA & CS BIL	Various, western NC

* HWA = Hemlock wooly adelgid, *Adelges tsugae*

Approximately 34,849 beneficial insects were released in North Carolina during 2003-2004.

NCDA & CS Beneficial Insects Laboratory

Summary of Quarantine Activities 2003-2004

A total of 5 shipments of foreign material were received by the NCDA &CS Insect Quarantine Facility during 2003 and 2004, and one shipment from previous years remained in the facility.

ID #	SPECIES	FAMILY	STAGE	#	ORIGIN	STATUS
Q02-1	***Lymantria dispar***	Lymantriidae	Larvae	126	NC	Insects dissected with a few held in refrigerator.
Q03-1	***Aethina tumida***	Nitiduliade	Adults		NC	Colony being maintained in quarantine for research.
Q04-1	***Calidiellum rufipenne***	Cerambycidae	Pupae/ larvae/ adults	Unknown 6 emerged to date	NC	Cedar logs being held in quarantine for maturation and emergence of adult beetles.
Q04-2	***Celastrus orbiculatus***	Celastraceae	seeds	2000	NC	Treatments currently being investigated to allow the sale of oriental bittersweet wreaths and preclude movement of viable seeds include the use of heat, ethylene oxide fumigation, and spray paint. Wreaths are frequently sprayed with clear paint to keep the yellow ovary walls attached to the wreath.

Rearing *Sasajiscymnus tsugae,* a Natural Enemy of Hemlock Woolly Adelgid

K.A. Kidd

The hemlock woolly adelgid (HWA), *Adelges tsugae* Annand, a pest of hemlocks (*Tsuga* spp.), is native to Asia (Fig.1). The insect was first found in the eastern US in the 1950s near Richmond, VA, but its spread was slow until it reached areas where hemlock is endemic. Upon reaching large, natural stands of hemlock, the insect population increased rapidly and was spread by birds and the movement of nursery stock, in addition to natural dispersal. Infestations are now found from Georgia to New Hampshire. The first infestations in NC were recorded in 1995 in two counties, and currently at least 25 counties are infested. After foreign exploration in Japan, part of the native range of HWA, several natural enemies were identified, and a small coccinellid, *Sasajiscymnus tsugae* (Sasaji and McClure) has now been reared and released from Georgia to New England as a biological control agent. As HWA infestations became more widespread, the need to rear additional beetles became acute, so cooperative agreements between NCDA&CS Beneficial Insect Laboratory (BIL), the USDA-Forest Service, and USDA-APHIS were initiated in 2002 to establish a rearing lab for beetles in NC.

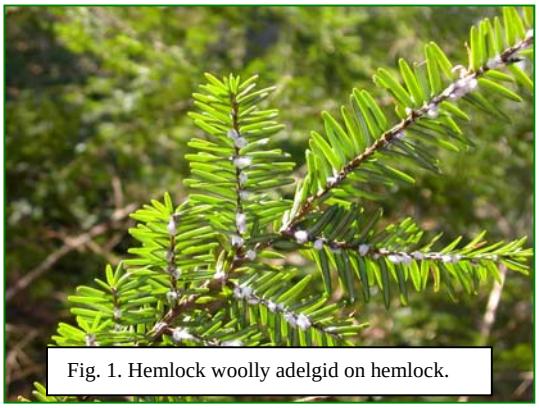


Fig. 1. Hemlock woolly adelgid on hemlock.

The rearing facility was established in space on the second floor of the BIL located in Cary, NC, with a large room for rearing and smaller cool room for storage of beetles. A walk-in cooler is used for storage of adelgid-infested hemlock boughs. A starter colony of beetles was obtained from the New Jersey Department of Agriculture (NJDA) in December 2002. Procedures for rearing were developed by the NJDA, and followed with minor modification. Groups of beetles in a ratio of two females to one male were placed in 4 liter jars for oviposition. Whenever possible each jar contained 15 beetles, 10 females and 5 males. Each jar contained a bouquet of hemlock twigs in a floral pick (Aquatube™, Syndicate Sales, Kokomo, IN), and three pieces of gauze (5cm X 5cm) were placed on the twigs. Females lay their eggs on the gauze as well as the twigs in a 50:50 ratio (D. Palmer, NJDA, personal comm.). Each week from December to June (2002-03) and November to May (2003-04), jars were opened, gauze and twigs

Fig. 2. *Sasajiscymnus tsugae* oviposition jars and rearing cages

removed, and eggs on the gauze squares counted. Beetles were counted and fresh jars set up, adding beetles to replace dead or missing ones. Numbers of jars ranged from 5 to 15 in the 2002-03 season and from 12 to 25 in 2003-04.

Gauze and twigs were placed in acrylic rearing boxes (61 X 61 X 48 cm) with additional fresh twigs and provided with honey and twigs until they completed their life cycle, on average, 5-6 weeks. Adults were transferred to a storage box and held until turned over to the Forest Service for release.

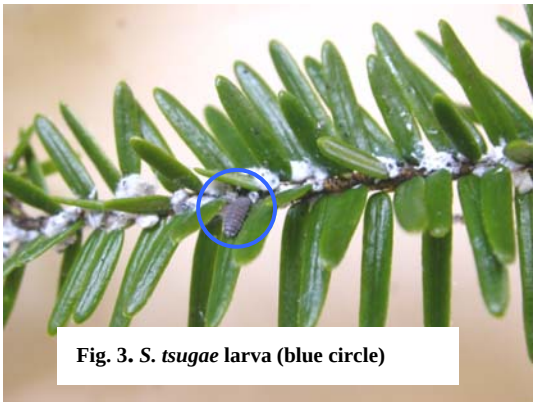


Fig. 3. *S. tsugae* larva (blue circle)

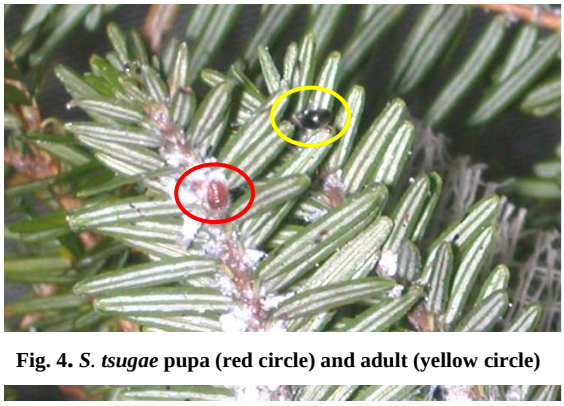


Fig. 4. *S. tsugae* pupa (red circle) and adult (yellow circle)

Results of *S. tsugae* production are shown in Figures 5 and 6. In the 2002-03 season, 44,238 eggs were collected and 7774 adults produced, with an average successful development rate of 17.6%. In 2003-04, 110,256 eggs developed into 22,192 adults, a success rate of 20.1%. The low return in the first season may be attributed to poor quality of adelgid and inadequate humidity controls. The winter and spring were rainy following a severe drought, leading to stressed trees, and poor adelgid quality. A new humidifier was installed at the lab in early 2004, allowing more consistent control of rearing conditions.

The 2004-05 rearing season is currently underway with over 30 oviposition jars in production with plans to add more jars and cages in the next weeks. A permanent full-time technician is overseeing the program with skilled part-time technicians maintaining consistent high-quality care. All of these factors are contributing to a higher rate of successful development of adults than in the past. *Sasajiscymnus tsugae* is not going to completely control the hemlock woolly adelgid, but biological control with this and other organisms may play a critical role in the preservation of eastern hemlocks.

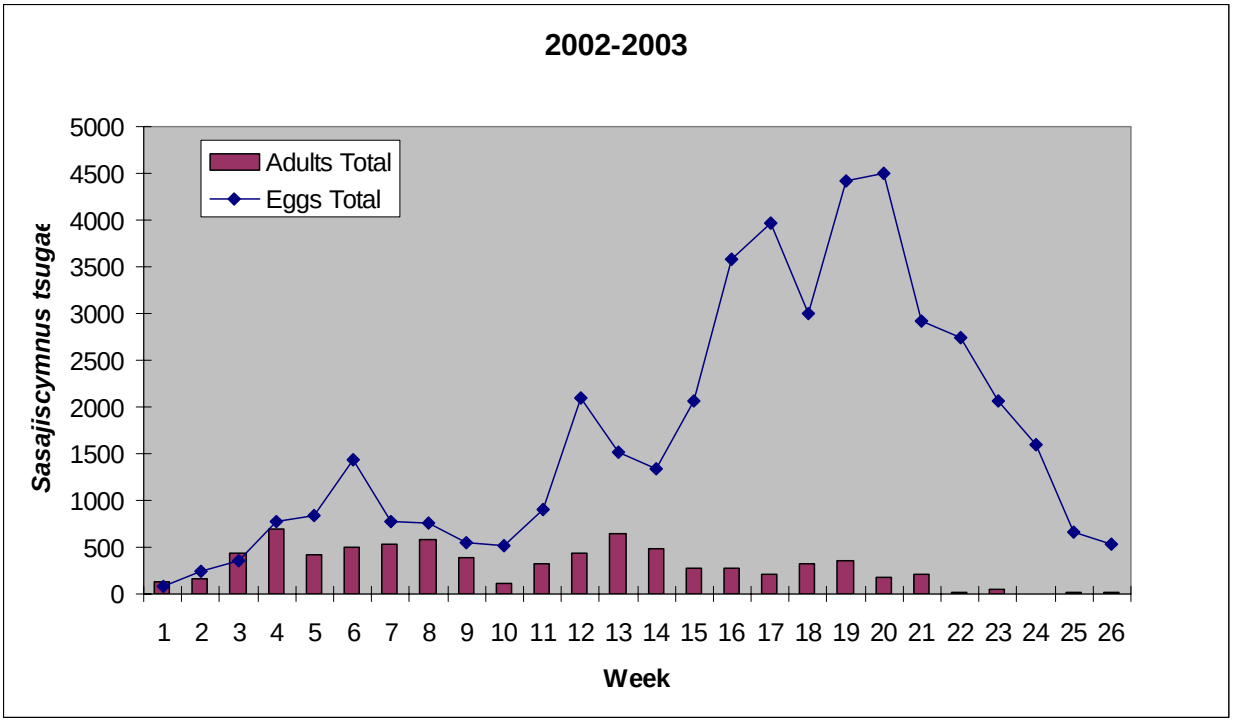


Fig. 5. *Sasajiscymnus tsugae* production 2002-03

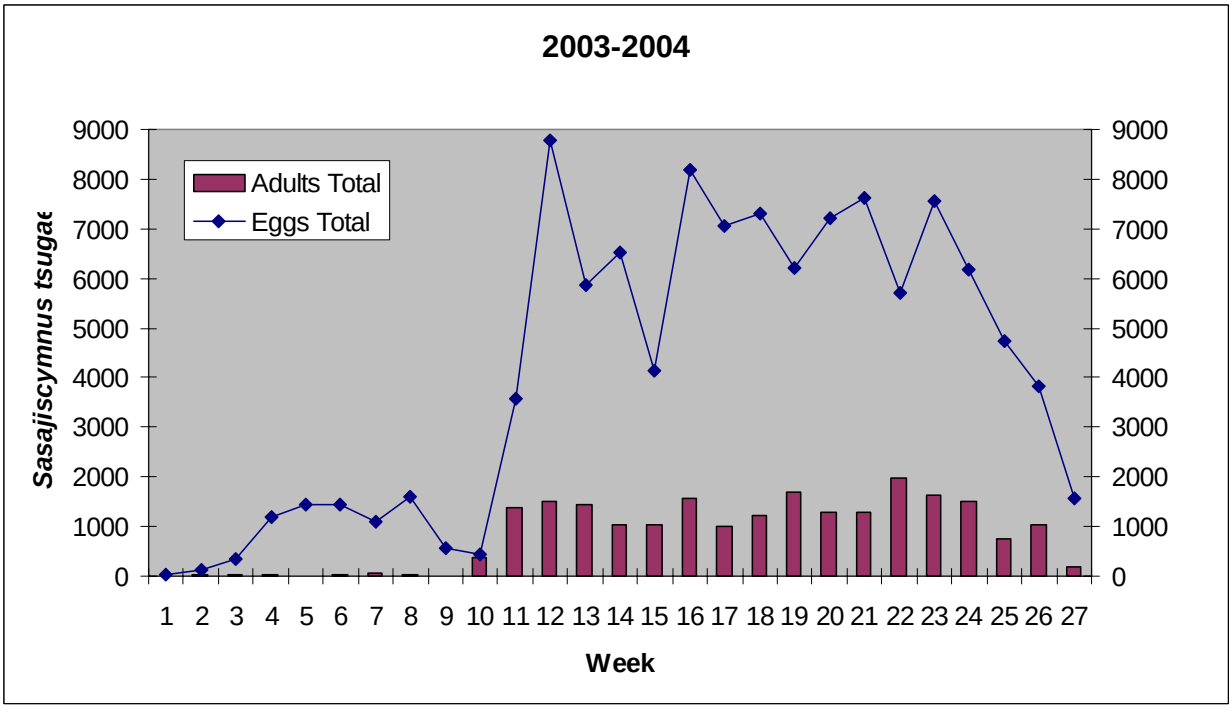


Fig 6. *Sasajiscymnus tsugae* production 2003-04

Studies of the Multicolored Asian Lady Beetle (*Harmonia axyridis*): 2003-2004

C.A. Nalepa

1) Field studies of visual attraction

Field studies testing the relative attractiveness of different visual stimuli to *Harmonia axyridis* (Pallas) (Coleoptera: Coccinellidae) seeking winter shelter continued during autumn of 2003 and 2004 at two sites: Asheville, and Cary, NC. It was found that linear intensity contrast is a visual attractant for flying beetles (Fig. 1). Initial findings were reported in a paper published during 2004 by the Entomological Society of America:

Nalepa, C.A., G.G. Kennedy and C. Brownie 2004. Orientation of multicolored Asian lady beetles to buildings. American Entomologist 50(3): 165-166.

Additional testing of a variety of visual stimuli is planned.

2) Survey for fungus

During the fall flight of 2003, a fungus was found infecting *Harmonia axyridis* for the first time in North Carolina; the fungus was identified as *Hesperomyces virescens* (Laboulbeniales: Ascomycetes) by Dr. Alexander Weir, State University of New York

A survey was conducted during the spring and summer of 2004 to determine if the fungus was also present on other coccinellid species in the state. Beetles were collected using a light trap set up at the Cary laboratory and by sweeping and hand-picking in a variety of crops across the state. Examination of the samples is ongoing.

3) Survey of coccinellids attracted to pitcher plants

Surveys of the coccinellid species attracted to pitcher plants were conducted in two sites during spring and early summer of 2004: the North Carolina Botanical Garden in Chapel Hill, NC, and a natural site located near Selma, NC. Results will be compared to historical data collected in North Carolina during the 1940's.

Figure 1. During the fall migration period *Harmonia axyridis* adults frequently land on the linear elements of a building, such as the drain pipes and doorframes depicted below. Recent work by the North Carolina Department of Agriculture in cooperation with scientists at North Carolina State University has demonstrated that it is the visual intensity contrast of these linear features or their shadows that attracts the beetles.

Cereal Leaf Beetle Insectary Program 2003

K.A. Kidd

Fig. 1. *T. julis* attacking CLB

The insectary program for cereal leaf beetle *Oulema melanopus* (L.) (CLB) (Coleoptera: Chyrsomelidae) and its parasitoids continued in 2003, but only one insectary was planted. (Details on insectary layouts and planting schemes may be found in previous reports). The fields at Oxford Research Station were too wet to plant, so only the Piedmont Research Station near Salisbury, NC was monitored. CLB populations were moderate to high in the field, and parasitoids were abundant (Figs. 1 and 2, Table 1). Parasitism by *Tetrastichus julis* (Walker) (Hymenoptera: Eulophidae), a multivoltine species peaked in late April and late May, reaching 100% on 29 May (Table 2). *Diaparsis temporalis* Horstmann (Hymenoptera: Ichneumonidae) was most prevalent in mid-May. Larvae were collected from the insectary 29 May and shipped to a USDA cooperator in Montana. We gratefully acknowledge the staff at the Piedmont Research Station for their contributions to this project.

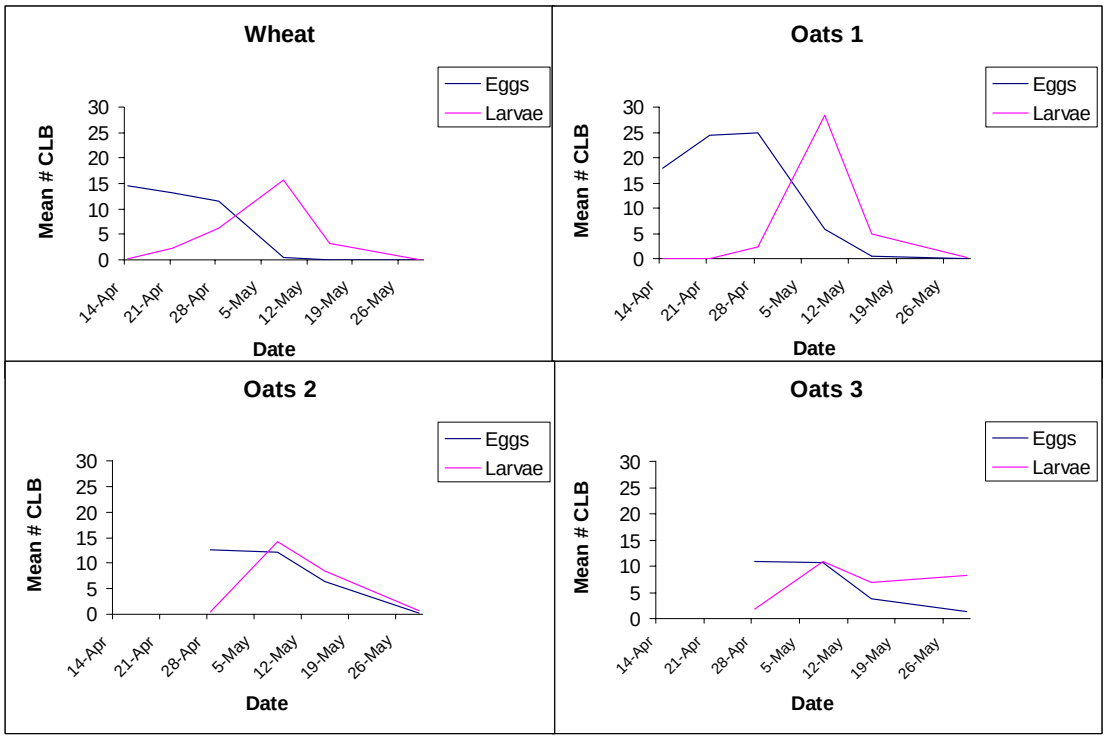


Fig. 2. Mean cereal leaf beetle populations by subplot, Piedmont Research Station, Rowan Co, NC, 2003.

Table 1. Cereal leaf beetle populations, Salisbury, NC, 2003. Mean (± SD) per ft^2.

Date	Planting	Eggs	Larvae
14 April	Wheat	14.5 (9.8)	0.3 (0.8)
	Oats 1	18.0 (17.2)	0.0 (0.0)
	Oats 2	2.7 (2.9)	0.0 (0.0)
	Oats 3	2.5 (2.9)	0.0 (0.0)
21 April	Wheat	13.2 (6.1)	2.2 (2.6)
	Oats 1	24.5 (8.3)	0.0 (0.0)
	Oats 2	Missing*	Missing*
	Oats 3	Missing*	Missing*
28 April	Wheat	11.5 (6.6)	6.3 (5.4)
	Oats 1	25.0 (10.6)	2.3 (1.9)
	Oats 2	12.7 (5.3)	0.5 (0.8)
	Oats 3	10.8 (8.0)	1.7 (3.2)
8 May	Wheat	0.5 (0.5)	15.8 (4.8)
	Oats 1	5.8 (2.6)	28.3 (7.4)
	Oats 2	12.2 (3.0)	14.3 (7.8)
	Oats 3	10.7 (5.2)	11.0 (8.2)
15 May	Wheat	0.0 (0.0)	3.3 (1.6)
	Oats 1	0.5 (0.5)	5.0 (2.4)
	Oats 2	6.5 (5.2)	8.5 (6.3)
	Oats 3	3.7 (3.8)	6.8 (4.6)
29 May	Wheat	0.0 (0.0)	0.0 (0.0)
	Oats 1	0.0 (0.0)	0.2 (0.4)
	Oats 2	0.2 (0.4)	0.7 (1.0)
	Oats 3	1.3 (1.8)	8.3 (10.3)

*Counts could not be completed due to rain.

Table 2. Mean parasitism of CLB larvae, Piedmont Research Station, 2003.

			% Parasitism (Mean # parasitoids/larva)	
Date	Planting	n	*T. julis*	*D. temporalis*
21 April	Wheat	16	56.2 (1.1)	12.5 (1.0)
28 April	Wheat	29	69.0 (3.8)	10.3 (1.0)
	Oats 1	52	44.2 (3.1)	5.8 (2.3)
	Oats 2 & 3	3	0.0	0.0
8 May	Wheat	26	3.8 (3)	30.8 (1.0)
	Oats 1	62	6.5 (4.5)	30.6 (1.0)
	Oats 2	59	6.8 (2.8)	11.9 (1.0)
	Oats 3	53	1.9 (3.0)	9.4 (1.0)
15 May	Wheat	20	0.0	50.0 (1.0)
	Oats 1	19	0.0	66.7 (1.0)
	Oats 2	20	5.0 (2.0)	70.0 (1.0)
	Oats 3	20	15.0 (3.7)	20.0 (1.0)
29 May	All Oats	23	100.0 (7.9)	13.0 (1.0)

Cereal Leaf Beetle Parasitoid Insectary (2004)

R. Norris and K.A. Kidd

The cereal leaf beetle (*Oulema melanopus* (L.)) (CLB), a nonindigenous pest of small grains, was detected in North Carolina in 1977 in 19 counties. A parasitoid insectary was established at the Piedmont Research Station in Rowan County, NC in 1987 to provide biological control parasitoids to CLB infected areas within NC and to other states if sufficient quantities were available.

The site is monitored annually to determine CLB population and parasitism. The insectary consists of two plots with 4 subplots planted with wheat, and staggered plantings of oats. Sites were monitoring weekly in 2004 from 6 April to 18 May for CLB eggs and larvae. To determine population densities, samples of eggs and larvae were taken from three 1 ft^2 (20.5" per 7-inch row spacing) subplots. Eggs removed from the field, were plated and observed for the presence and emergence of *Anaphes flavipes* (Foerster) (Hymenoptera: Mymaridae). Larvae were collected and returned to the lab for dissection to determine parasitism.

Cereal leaf beetle eggs were noted in all plots by 16 April. The highest number of eggs found were in the 2nd oat planting (24 / ft^2) on 23 April (Fig1). The first parsitized eggs were found in samples collected 29 April from oat plots (Table 2). The maximum egg attack rate occurred during the first two weeks of May. A shipment of approx. 50 CLB eggs was sent to Richard Worth, Oregon Dept. of Agriculture on 10 May for release.

Ken Ahlstrom, NCDA & CS Ag. Research Specialist, dissected CLB larvae to determine the presence of larval parasitoid, *Tetrastichus julus* (T.j.) and *Diaparsis temporalis* (D.t.). CLB larvae were detected in all plots by 29 April (Table 3). Maximum larval attack rate for T.j. and D.t. was 35% (Table 3). No larvae were shipped for release.

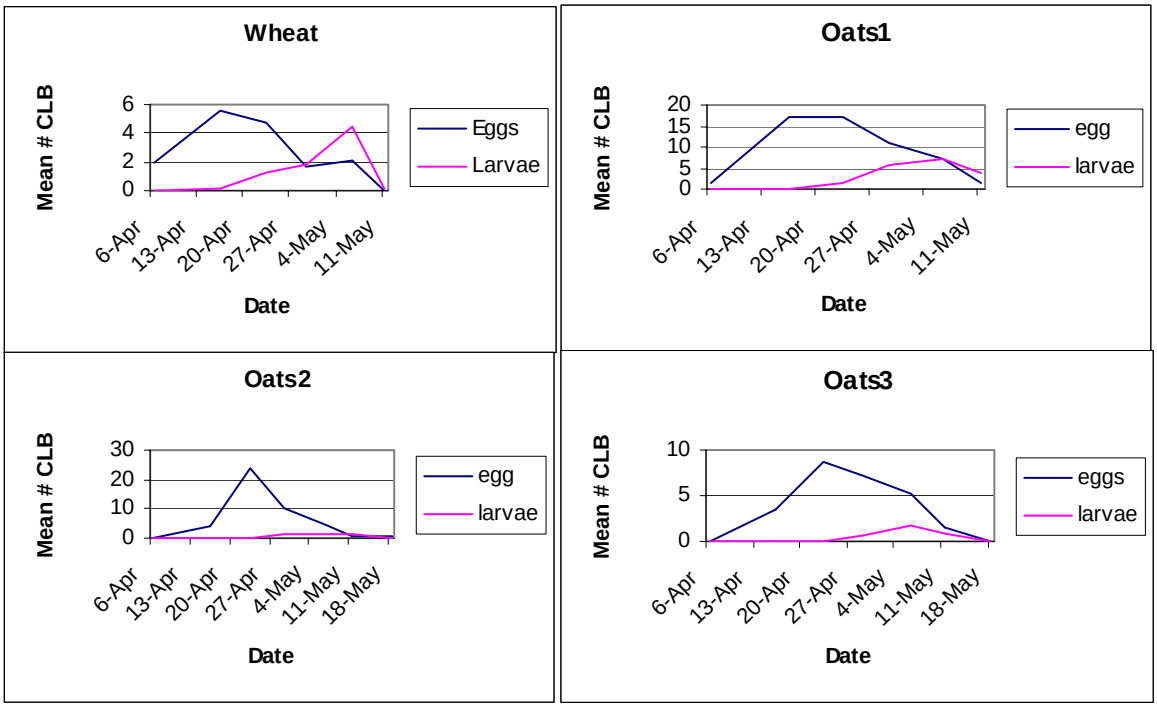


Fig. 1 Mean cereal leaf beetle populations by subplot, Piedmont Research Station, Rowan Co, NC, 2003.

Table 2. Cereal Leaf Beetle Egg Parasitism by *Anaphes flavipes*, Piedmont Research Station, Salisbury, NC, 2004.

Date	Wheat	Oats1	Oats2	Oats3
6 April	0%	0%	0%	0%
16 April	0	0	0	0
23 April	0	0	0	0
29 April	0	46	6	0
6 May	16	47	52	47
11 May	0	29	94	50
18 May	0	0	100	0

Some eggs contained 2-3 *Anaphes*.

Table 3. Mean Parasitism of CLB larvae, Piedmont Research Station, 2004

			% Parasitism (Mean # parasitoids/larva)	
Date	Planting	n	*T. julis*	*D. temporalis*
29 April	Wheat	47	23.0 (4.2)	2.0 (1.0)
	Oats1	49	29.0 (4.6)	4.0 (1.0)
	Oats2	20	35.0 (5.1)	0.0
	Oats3	19	16.0 (2.5)	5.0 (1.0)
7 May	Wheat	26	3.5 (4.0)	26.0 (1.0)
	Oats 1	24	10.0 (3.5)	18.0 (1.4)
	Oats 2	16	23.0 (5.4)	3.5 (1.0)
	Oats 3	15	26.0 (5.0)	18.0 (1.0)
14 May	Wheat	5	0.0	0.0
	Oats1	25	2.5 (2.0)	35.0 (1.0)
	Oats 2	12	3.0 (1.5)	13.0 (1.0)
	Oats3	7	0.0	5.0 (1.0)

The Red Imported Fire Ants: Phorid Fly (*Pseudacteon tricuspis)* Release Project 2003-2004

R. Norris and K.A. Kidd

The red imported fire ant (*Solenopsis invicta* Buren) (Hymenoptera: Formicidae) (RIFA) was accidentally introduced into the United States around the 1930's. Since its introduction it has spread to millions of acres in the Southeastern United States. As of 3 March 2004, all or parts of 57 counties in North Carolina were reported infested with RIFA (NCDA & CS 2004) (Fig.1).

The phorid fly (*Pseudacteon tricuspis*), (Diptera: Phoridae) identified by USDA-ARS as a natural enemy of the fire ants in South America (Jouvenaz 1983), is being evaluated as a means of suppressing current RIFA populations in NC. Although RIFA parasitism by phorids ultimately leads to decapitation, potential population suppression is attributed to fear of the fly. In the presence of the phorid, RIFA foraging is reduced, thereby allowing native ants to gain a more competitive edge for food (Williams et.al. 2004).

Phorid flies have been released in the following North Carolina counties, Beaufort 2000, Duplin 2002, Robeson 2003 and Wayne Co. 2004. The USDA-ARS in Gainesville, FL provided the flies for all releases. Details of the 2000 and 2002 releases may be found in previous reports. About 3849 phorid flies were released at the Robeson county site between 19 and 30 May 2003. About 5,000 flies were released between 3 and 17 June 2004 at the Wayne county site.

Monitoring for phorid flies began 32 days after the initial release date. A total of six generations of flies were found before temperatures dropped too low (< 70^{o}) for flies to be observed. During the fall of 2004, 2002-03 release sites were also monitored. One phorid fly was found at the Robeson county site on 1 November 2004. The fly was sent to USDA APHIS PPQ CPHST Soil Inhabiting Pests Laboratory in Gulfport, MS to confirm identification. The fly was determined to be *P. tricuspis*. This find confirms the first overwintering survival of *P. tricuspis* on RIFA in NC. Thus far no flies have been confirmed to overwinter at the Warsaw or Beaufort sites.

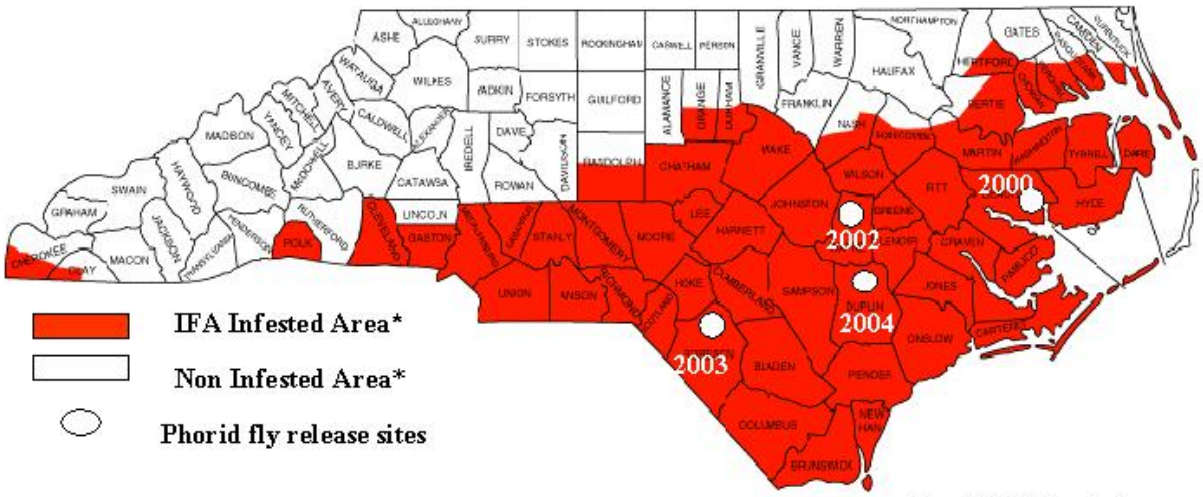
NCDA & CS Plant Industry Division - Red Imported Fire Ant - www.ncagr.com/plantind/plant/entomol/IFA.html

Jouvenaz, Donald P. 1983. Natural enemies of fire ants, Fla. Entomol. 66:111-122.

Williams, David F. and Richard D. deShazo. 2004. Biological control of fire ants: an update on new techniques, Ann Allergy Asthma Immunol. 93: 15-22.

Fig. 1 Phorid Fly Release Sites In North Carolina

2000 - 2004



* Effective Date March 3, 2004

Map: NCDA Plant Industry

Apiary Inspection Program - 2003

Donald I. Hopkins

The 2003 honey bee season was disappointing for beekeepers in North Carolina. The colonies that came through the winter were in generally moderate to poor condition. This situation had been anticipated by many of the members of the beekeeping industry in NC because of the preceding summer and fall. The 2002 drought and high mite pressure were contributing factors to the poor overwintering. The unusually wet spring of 2003 had not been anticipated. Although the rain was welcomed by the beekeepers it did affect the development of the spring colonies and curtailed the honey flow in the spring and early summer.

On the positive side, the colonies did develop over the summer and the general health of the bees was better with regard to mites than earlier in the year or the preceding autumn. Meeting the food requirements for the bees, has for this season, replaced the mites and the small hive beetles as the primary concern of most of the state's beekeepers. Although the small hive beetle has spread to over forty-seven counties the damage done by the beetle has not been too severe. Because of these factors, the quarantine has been lifted, although beekeepers are asked to prevent the spread of the beetle by moving infested hives.

North Carolina State University has appointed a new extension Apiculturist, Dr. David Tarpy, and the State's Apiarist and Inspectors all feel enthusiastic that we will enjoy a close working relationship with the new extension personnel.

The Inspectors continue to help the beekeepers through field inspections, educational meetings and field days and make every attempt to be available to assist the beekeepers in any way necessary. The numbers of colonies documented for inspection for 2003 are 5001 inspected, and 242 hives found with American foulbrood. Two of our goals for 2004 are to improve our over all inspection documentation and to reduce the rate of disease and pest problems.

Apiary Inspection Program 2004

In 2004, beekeepers in the state still faced several challenges in recovering from the preceding year. The 2003 honey bee season had been disappointing for North Carolina beekeepers due to myriad factors. As in 2003, the colonies that came through the winter were generally in moderate to fair condition, and the spring honey flow was conducive to a good colony build up. *Varroa* mite levels in most colonies were low, and the outlook was for a good honey harvest. There was a shortage of available colonies for pollination services, and measures were taken by the beekeepers to fill this increasingly growing demand.

The colonies did develop over the summer, and the general health of the bees was good for most of the early part of the summer. The weather did not allow for a strong summer honey flow, so many beekeepers needed to add supplemental feed to their colonies. The small hive beetle has continued its slow progression into more counties of the state, but, as was the case last year, infestations caused little significant damage. This pest still needs more study to determine its effect on both the honey bee colony and honey extracting facilities.

The area of greatest concern during 2004 was in regard to pesticide-resistant *Varroa* mites. Several cases of resistance have been documented, including mite populations that are resistant to more than one of the miticides currently registered. This is a problem that has the potential to become more serious in the 2005 season. Alternative treatments are being

developed, and more resistant bees are being raised, but the mites can adapt faster than alternatives can be put into place.

In 2003, North Carolina State University appointed a new extension Apiculturist, Dr. David Tarpy, and the State's Apiarist and Inspectors all felt enthusiastic that we would enjoy a close working relationship with the new extension personnel. I am pleased to state that this new relationship has developed and that there have been several opportunities to further the close working relationship with extension personnel.

The inspectors continue to help the beekeepers through field inspections, educational meetings and field days, and to make every attempt to be available to assist the beekeepers in any way necessary. The numbers of colonies documented for inspection in 2004 are 13,212 hives inspected, with 90 hives found infected with American foulbrood. Our goals for 2005 continue to be to improve our over all inspection documentation and to reduce the rate of disease and pest problems.