Special Technology Development Program
Progress Report

PROJECT NUMBER: R8-2001-02

PROJECT TITLE: Nantucket Pine Tip Moth Phenology and Timing of Insecticide Applications in Arkansas, Louisiana, and Texas

PROJECT STATUS: Continuing (funds requested for the next fiscal year to continue the project)

EXPECTED PROJECT DURATION: 2 yrs

ORIGINAL EXPECTED COMPLETION DATE OF THE PROJECT: 2002

EXPECTED COMPLETION DATE OF THE PROJECT: 2002

SUBJECT (from original application form)**:** Models 1, Monitoring 2, Organism Biology 2, Pesticides: Microbial 2, Pesticides: Synthetic 2, Silvicultural Technology 2

STATUS OF SUBJECT SPECIES: native

PROJECT OBJECTIVES: To provide a more effective, economically-viable and ecologically compatible means for controlling tip moth infestations than currently exists in the Western Gulf region. Specifically, to model tip moth phenology and predict optimal spray periods throughout the region and provide prediction dates to forest managers in a concise, easily used format.

BRIEF DESCRIPTION OF THE PROJECT:

Year 1: The following was completed during FY 2001

1) Raw climatic data obtained from the Southern Regional Climate Center, Baton Rouge, LA. Mean daily maximum and minimum temperatures calculated for 150 locations in the Western Gulf region.
2) Tip moth phenology modeled for each location (Tables 1-3).
3) Optimal spray periods predicted for each of 115 locations where either 3 or 4 generations occurred annually (Tables 1-3).
4) Protocol established and collaborators contacted in reference to initiating model validations at 2 field sites in each of Arkansas, Louisiana and Texas during FY2002.

Year 2: The following to be completed during FY 2002

1) Model validation in Arkansas, Louisiana, and Texas.
2) Manuscript preparation.
3) Technology transfer via the Western Gulf Forest Pest Management Consortium (WGFPMC) and website accessible at www.forestpests.org.

CHANGES TO ORIGINAL PROJECT SCOPE OR OBJECTIVES: None

FHP LEAD CONTACT:

Name	Affiliation (Office or Dept.)	Phone, E-mail, Fax
John W. Taylor, Jr.	USDA Forest Service FHP Atlanta, GA	(404) 347-2718 (P) (404) 347-1880 (F) jwtaylor@fs.fed.us

FHP LEAD INVOLVEMENT:

Role	Time Commitment
Facilitation of cooperators, grant submission	12 hrs

PRINCIPAL INVESTIGATOR(S):

Name	Affiliation (Office or Dept.)	Phone, E-mail, Fax
Christopher J. Fettig	USDA Forest Service PSWRS Davis, CA 95616	(530) 758-5151 (P) (530) 758-5155 (F) cfettig@davis.com
C. Wayne Berisford	University of Georgia Department of Entomology	(706) 542-7888 (P) (706) 542-2640 (F) berisford@bugs.ent.uga.edu

PRINCIPAL INVESTIGATOR(S) INVOLVEMENT:

Name	Role	Time Commitment
Christopher J. Fettig	Data collection, modeling, validation, manuscript preparation, technology transfer	800 hrs (FY 2001) 160 hrs (FY 2002)
C. Wayne Berisford	Technical expertise	12 hrs (FY 2001) 12 hrs (FY 2002)

COOPERATORS:

Name	Affiliation (Office or Dept.)	Phone, E-mail, Fax
Donald M. Grosman	Texas Forest Service Lufkin, TX	(409) 639-8170 (P) (409) 639-8175 (F) dgrosman@tfs.tamu.edu
John T. Nowak	USDA Forest Service FHP Pineville, LA	

COOPERATOR INVOLVEMENT:

Name	Role	Time Commitment
Donald M. Grosman	Locate validation sites in TX Aid in model validation and technology transfer to forest managers	60 hrs (FY 2002)
John T. Nowak	Locate validation sites in AR and LA Aid in model validation	80 hrs (FY 2002)

PRODUCTS AND DUE DATES:

1) Tip moth phenology descriptions submitted to Environmental Entomology by January 2002.
2) Optimal spray period predictions and validation descriptions submitted as USDA Forest Service Research Paper by December 2002
3) Technology transfer as an extension-type document prepared for forestpests.org by December 2002.

STATUS OF PRODUCTS/PRESENTATIONS: Project is currently ahead of schedule for completion and delivery of products during FY 2002.

FIRST FISCAL YEAR FUNDED: 2001

FUNDS OBLIGATED FROM BEGINNING OF PROJECT THROUGH CURRENT FISCAL YEAR:

	Item	Requested Funding	Received Funding	Expended Funding
PREVIOUS YEAR FY 2001				
Administration	Salary	10950	10950	
	Overhead			
	Travel	3000	3000	
Procurements	Contracting			
	Equipment			
	Supplies	2950	2950	
YEAR TOTALS		16900	16900	

CURRENT YEAR FY 2002				
Administration	Salary	4950		
	Overhead			
	Travel	7000		
Procurements	Contracting			
	Equipment			
	Supplies	6050		
YEAR TOTALS		18000		

FUNDS NOT USED FROM PREVIOUS FISCAL YEAR:

Fiscal Year	STDP Funding Allocated	Funds Obligated	Funds Unused
			None

EXPECTED BUDGET FOR NEXT FISCAL YEAR: (include both monetary and in-kind, excluding FHP base funding and salaries) (extend table as needed)**:**

	Item	Requested FHP STDP Funding	Other-Source Funding	Source
Administration	Salary	None		
	Overhead			
	Travel			
Procurements	Contracting			
	Equipment			
	Supplies			
Totals				

DIFFERENCE BETWEEN ORIGINAL AND AMENDED REQUESTS AND JUSTIFICATION:
None

STDP FUNDING NEEDED:

Total estimated additional future funding needed beyond the current fiscal year:

Estimated STDP funding needed in remaining year(s) of the project by fiscal year. Show separately the funding to be requested/provided from other sources (extend the table as necessary).

Fiscal Year	**STDP Funding**	**Other-Source Funding**	**Source**
2002	18000	0	-

Table 1. Location, phenology, and optimal spray period predictions at 64 weather stations located throughout the natural range of *Rhyacionia frustrana* (Comstock) in Arkansas.

		Optimal Spray Period Intervals			
Location	**Phenology[a]**	**1**	**2**	**3**	**4**
Alicia	3	Apr 16-20	June 15-19	Aug 4-8	
Aluminum Fork	4	Apr 11-15	June 10-14	July 30-Aug 3	Sept 13-17
Arkadelphia	4	Apr 6-10	June 5-9	July 25-29	Sept 8-12
Arkansas Post	4	Apr 6-10	May 31-June 4	July 20-24	Sept 3-7
Beedeville	3	Apr 16-20	June 15-19	July 30-Aug 3	
Benton	4	Apr 6-10	June 5-9	July 30-Aug 3	Sept 13-17
Blakeley Mtn.	3	Apr 16-20	June 25-29	Aug 9-13	
Cabot	3	Apr 16-20	June 20-24	Aug 4-8	
Calion	4	Apr 6-10	June 5-9	July 25-29	Sept 8-12
Camden	4	Apr 6-10	June 5-9	July 25-29	Sept 8-12
Clarendon	3	Apr 16-20	June 15-19	Aug 4-8	
Conway	4	Apr 11-15	June 10-14	July 30-Aug 3	Sept 13-17
Corning	3	Apr 21-25	June 20-24	Aug 9-13	
Crossett	4	Apr 6-10	June 5-9	July 30-Aug 3	Sept 13-17
Dardanelle	4	Apr 11-15	June 10-14	July 30-Aug 3	Sept 13-17
Dermott	4	Apr 11-15	June 5-9	July 25-29	Sept 8-12
DesArc	4	Apr 16-20	June 10-14	July 30-Aug 3	Sept 13-17
Dierks	3	Apr 16-20	June 20-24	Aug 9-13	
Dumas	4	Apr 6-10	May 31-June 4	July 20-24	Aug 29-Sept 2
Eldorado	4	Apr 6-10	June 5-9	July 25-29	Sept 3-7
Eudora	4	Apr 6-10	June 5-9	July 20-24	Sept 3-7
Eureka Springs	3	Apr 21-25	June 25-29	Aug 14-18	
Fayetteville	3	Apr 26-30	June 30-July 4	Aug 24-28	
Fordyce	4	Apr 11-15	June 5-9	July 25-29	Sept 8-12
Fort Smith	3	Apr 16-20	June 20-24	Aug 9-13	
Gilbert	3	Apr 16-20	June 25-29	Aug 14-18	
Gravette	3	Apr 21-25	June 25-29	Aug 14-18	
Greenbrier	3	Apr 16-20	June 20-24	Aug 4-8	
Helena	3	Apr 16-20	June 15-19	Aug 4-8	
Hope	4	Apr 11-15	June 10-14	July30-Aug 3	Sept 13-17
Hot Springs	4	Apr 16-20	June 10-14	July 30-Aug 3	Sept 13-17
Jonesboro	3	Apr 16-20	June 15-19	July 30-Aug 3	
Keiser	3	Apr 21-25	June 20-24	Aug 4-8	
Keo	4	Apr 11-15	June 10-14	July 25-29	Sept 13-17
Leadhill	3	Apr 21-25	June 25-29	Aug 9-13	
Leola	4	Apr 11-15	June 5-9	July 25-29	Sept 13-17
Little Rock	4	Apr 16-20	June 10-14	July 30-Aug 3	Sept 13-17
Magnolia	4	Apr 1-5	May 31-June 4	July 25-29	Sept 3-7
Malvern	4	Apr 6-10	June 5-9	July 30-Aug 3	Sept 13-17
Mammoth Springs	3	Apr 21-25	June 25-29	Aug 14-18	
Marianna	3	Apr 16-20	June 20-24	Aug 4-8	
Marshall	3	Apr 26-30	June 30-July 4	Aug 19-23	
Mensa	3	Apr 21-25	June 25-29	Aug 14-18	
Monticello	4	Apr 11-15	June 10-14	July 30-Aug 3	
Morrilton	4	Apr 11-15	June 5-9	July 25-29	Sept 8-12
Mountainburg	3	Apr 16-20	June 25-29	Aug 14-18	

Mountain Home	3	Apr 21-25	June 30-July 4	Aug 14-18	
Mountain View	3	Apr 21-25	June 30-July 4	Aug 14-18	
Newport	3	Apr 21-25	June 20-24	Aug 4-8	
Paragould	3	Apr 21-25	June 20-24	Aug 4-8	
Perry	3	Apr 16-20	June 20-24	Aug 4-8	
Pocahontas	3	Apr 16-20	June 20-24	Aug 4-8	
Portland	4	Apr 6-10	May 31-June 4	July 20-24	Sept 3-7
Prescott	4	Apr 6-10	May 31-June 4	July 20-24	Sept 3-7
Rohwer	4	Apr 16-20	June 10-14	July 30-Aug 3	Sept 13-17
St. Charles	4	Apr 16-20	June 10-14	July 30-Aug 3	Sept. 13-17
Searcy	4	Apr 16-20	June 10-14	July 30-Aug 3	Sept. 13-17
Stuttgart	4	Apr 6-10	June 5-9	July 20-24	Sept 3-7
Subiaco	4	Apr 11-15	June 10-14	July 30-Aug 3	Sept.13-17
Texarkana	4	Apr 1-5	May 26-30	July 15-19	Aug 24-28
Waldron	4	Apr 11-15	June 10-14	July 30-Aug 3	Sept 13-17
Warren	4	Apr 11-15	June 10-14	July 30-Aug 3	Sept 13-17
West Memphis	3	Apr 16-20	June 20-24	Aug 4-8	
Wynne	4	Apr 16-20	June 10-14	July 30-Aug 3	Sept 13-17

[a] Represents predicted number of generations completed each year at that location

Table 2. Location, phenology, and optimal spray period predictions at 44 weather stations located throughout the natural range of *Rhyacionia frustrana* (Comstock) in Louisiana.

		Optimal Spray Period Intervals			
Location	**Phenology[a]**	**1**	**2**	**3**	**4**
Alexandria	4	March 22-26	May 21-25	July 10-14	Aug 19-23
Ashland	4	Apr 1-5	May 31-June 4	July 20-24	Sept 3-7
Bastrop	4	Apr 1-5	May 26-30	July 15-19	Aug 24-28
Baton Rouge	5	-[b]	-	-	-
Bienville	4	Apr 1-5	May 31-June 4	July 20-24	Aug 29-Sept 2
Bogalusa	5	-	-	-	-
Bunkie	4	Mar 22-26	May 21-25	July 10-14	Aug 19-23
Carville	5	-	-	-	-
Clinton	4	Mar 17-21	May 16-20	July 10-14	Aug 19-23
Cotton Valley	4	Apr 6-10	June 5-9	July 25-29	Sept 3-7
Crowley	5	-	-	-	-
DeQuincy	4	Mar 17-21	May 21-25	July 10-14	Aug 19-23
DeRidder	4	Mar 22-26	May 21-25	July 10-14	Aug 19-23
Donaldsville	5	-	-	-	-
Elizabeth	4	Mar 17-21	May 21-25	July 10-14	Aug 19-23
Franklin	5	-	-	-	-
Gorum Fort	4	Mar 17-21	May 21-25	July 10-14	Aug 19-23
Grand Coteau	5	-	-	-	-
Hackberry	-	-	-	-	-
Homer	4	Apr 6-10	June 5-9	July 25-29	Sept 3-7
Houma	5	-	-	-	-
Jeanerette	5	-	-	-	-
Jena	4	Mar 27-31	May 26-30	July 15-19	Aug 24-28
Jennings	5	-	-	-	-
Lafeyette	5	-	-	-	-
Lake Charles	5	-	-	-	-
Lake Providence	4	Apr 6-10	May 31-June 4	July 20-24	Aug 29-Sept 2
Leesville	4	Mar 22-26	May 21-25	July 15-19	Aug 24-28
Minden	4	Apr 1-5	May 31-June 4	July 20-24	Aug 29-Sept 2
Monroe	4	Apr 1-5	May 31-June 4	July 15-19	Aug 29-Sept 2
Morgan City	5	-	-	-	-
Natchitoches	4	Mar 27-31	May 21-25	July 10-14	Aug 19-23
New Orleans	5	-	-	-	-
New Roads	5	-	-	-	-
Oberlin	5	-	-	-	-
Olla	4	Mar 22-26	May 26-30	July 15-19	Aug 29-Sept 2
Paradis	5	-	-	-	-
Plain Deal	4	Apr 6-10	June 5-9	July 25-29	Sept 8-12
Ruston	4	Apr 1-5	May 31-June 4	July 20-24	Sept 3-7
St. Joseph	4	Apr 1-5	May 26-30	July 15-19	Aug 29-Sept 2
Shreveport	4	Mar 27-31	May 26-30	July 15-19	Aug 29-Sept 2
Tallulah	4	Apr 1-5	May 31-June 4	July 20-24	Aug 29-Sept 2
Winnfield	4	Mar 22-26	May 26-30	July 15-19	Aug 29-Sept 2
Winnsboro	4	Apr 1-5	May 26-30	July 15-19	Aug 29-Sept 2

[a] Represents predicted number of generations completed each year at that location

[b] Spray timing values are not available for controlling 5 generation phenologies

Table 3. Location, phenology, and optimal spray period predictions at 42 weather stations located throughout the natural range of *Rhyacionia frustrana* (Comstock) in Texas.

		Optimal Spray Period Intervals			
Location	**Phenology[a]**	**1**	**2**	**3**	**4**
Anahuac	5	-[b]	-	-	-
Angleton	5	-	-	-	-
Aransas	5	-	-	-	-
Athens	4	Mar 22-26	May 21-25	July 10-14	Aug 19-23
Austin	5	-	-	-	-
Bay City	5	-	-	-	-
Beaumont	5	-	-	-	-
Beeville	5	-	-	-	-
Brenham	5	-	-	-	-
Broaddus	4	Mar 27-31	May 26-30	July 15-19	Aug 24-28
Cameron	5	-	-	-	-
Carthage	4	Mar 27-31	May 26-30	July 15-19	Aug 29-Sept 2
Center	4	Mar 27-31	May 26-30	July 20-24	Aug 29-Sept 2
Centerville	4	Mar 22-26	May 26-30	July 15-19	Aug 24-28
Clarksville	4	Apr 11-15	June 10-16	July 30-Aug 3	Sept 8-12
Cleveland	4	Mar 17-21	May 21-25	July 10-14	Aug 19-23
Coldspring	4	Mar 22-26	May 21-25	July 10-14	Aug 24-28
College Station	5	-	-	-	-
Columbus	5	-	-	-	-
Corpus Christi	5	-	-	-	-
Corsicana	4	Apr 1-5	May 31-June 4	July 15-19	Aug 24-28
Crockett	4	Mar 27-31	May 26-30	July 15-19	Aug 24-28
Cuero	5	-	-	-	-
Daingerfield	5	-	-	-	-
Emory	4	Apr 6-10	June 5-9	July 20-24	Sept 3-7
Evadale	4	Mar 17-21	May 21-25	July 10-14	Aug 24-28
Fairfield	4	Mar 22-26	May 21-25	July 10-14	Aug 14-18
Gilmer	4	Apr 6-10	June 5-9	July 25-29	Sept 3-7
Greenville	4	Apr 11-15	June 5-9	July 25-29	Sept 8-12
Groveton	4	Mar 17-21	May 21-25	July 10-14	Aug 19-23
Hallettsville	5	-	-	-	-
Henderson	4	Apr 1-5	May 31-June 4	July 20-24	Aug 29-Sept 2
Houston	5	-	-	-	-
Huntsville	5	-	-	-	-
Jacksonville	4	Mar 22-26	May 21-25	July 10-14	Aug 19-23
Jasper	4	Mar 22-26	May 21-25	July 15-19	Aug 24-28
Kaufman	4	Mar 27-31	May 31-June 4	July 20-24	Aug 29-Sept 2
Lufkin	4	Mar 22-26	May 21-25	July 10-14	Aug 19-23
Marlin	5	-	-	-	-
Mexia	4	Mar 27-31	May 26-30	July 15-19	Aug 24-28
Mt. Pleasant	4	Apr 6-10	June 5-9	July 25-29	Sept 3-7
Paris	4	Apr 11-15	June 5-9	July 20-24	Sept 3-7

[a] Represents predicted number of generations completed each year at that location
[b] Spray timing values are not available for controlling 5 generation phenologies