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COOPERATIVE PLANT PEST REPORT FOR CALIFORNIA

GYPSY MOTH STUDY
SIGNIFICANT NEW NATIVE HOSTS IN CALIFORNIA

On March 30, 1981, Dr. J. Gordon Edwards (San Jose State University) and Dr. Robert A. Fusco (Bio-Control Section of Pennsylvania Bureau of Forestry) reported the results of a research study conducted at the request of Dr. Isi Siddiqui, and underwritten by the CDFA Gypsy Moth Program. This study was to determine possible host plants of the California flora for Gypsy Moths, should the pest establish itself in the State. Following are excerpts from Dr. Edwards' Report:

"Background: The Gypsy Moth, *Lymantria dispar* (L.), has been a major pest in Europe for centuries and a severe pest in eastern United States for more than a hundred years. The spread westward, since 1958 (after the species had been brought to the brink of extermination in this country), was facilitated by the withdrawal of effective control measures. The increasing numbers of recreational vehicles and moving vans transporting people and furniture away from the areas of heavy Gypsy Moth infestation supplied the mobility which the moth species lack under natural conditions. Although the males fly well, the females (despite their large wings) are flightless. Within a decade, the pests had re-occupied all the areas from which they had been purged during the mid-1950's (Vermont, Rhode Island, Connecticut, Delaware, Maryland, New York, New Jersey and eastern Pennsylvania), and have been expanding their range ever since that time. They now infest 22 states, from coast to coast, and the list grows every year. From Maine to Maryland, 1980, Gypsy Moth defoliation increased over 800% compared to 1979. It was the worst year since the pests were introduced into this country 111 years ago. The larvae stripped the foliage from more than 5 million acres in the northeast last summer, including 2,800,000 acres of forest in New York, 907,000 in Massachusetts, 440,000 in Pennsylvania, 412,000 in New Jersey, 372,000 in Connecticut, 221,000 in Maine, and 184,000 in New Hampshire. Authorities estimate that 1981 may see nearly twice that much destruction, based upon the prevalence of fertile egg-masses now present!

"Hundreds of egg-masses have been discovered by California border inspectors, during the past 18 years, on or beneath vehicles or on lawn furniture being moved into this state. Only in San Jose did the masses hatch and infest a number of trees with voracious larvae. There, large numbers of the larvae thrived and pupated, giving rise to hundreds of adults in the infested residential area of Willow Glen (a suburb of San Jose). Fortunately, an aerial spray of Dimilin of the entire area, supplemented by massive ground applications of Sevin in every yard in the neighborhood, appears to have totally eradicated the pests in San Jose. Michigan was not so fortunate, and Gypsy Moths are now destroying forests and ornamental trees in 19 counties.

STATE OF CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

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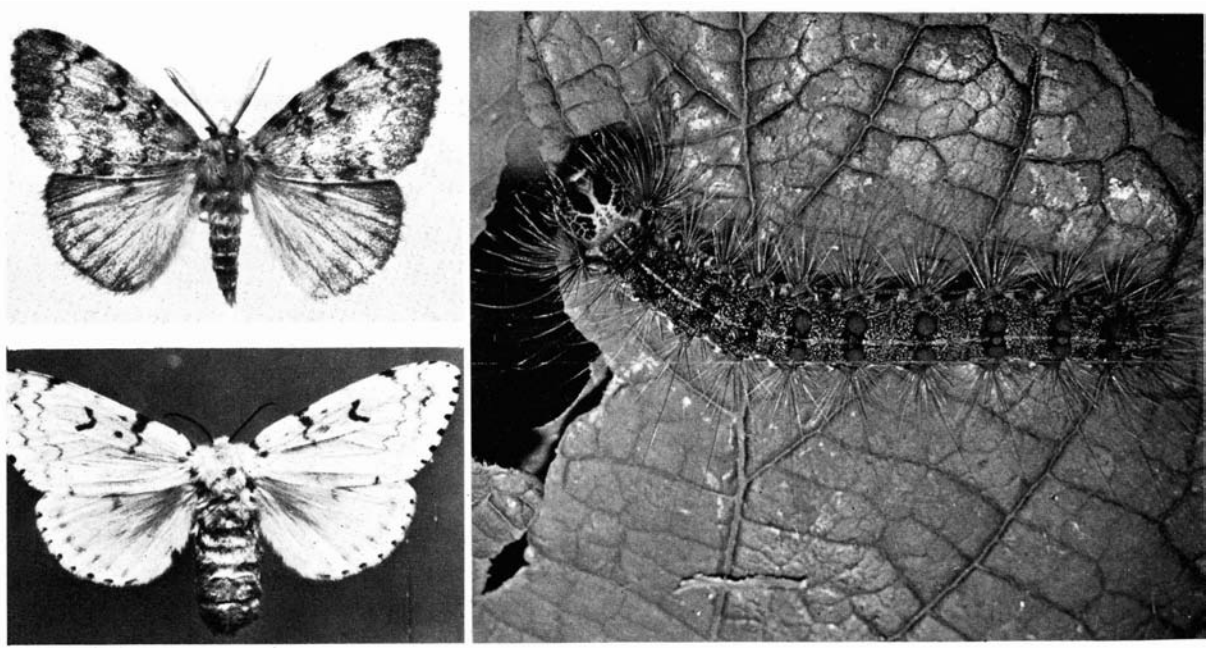

The Gypsy Moth. Top left, male. Bottom, female. At right, larva feeding. (From USDA Program Aid No. 1006. January, 1981 Edition.)

"Wisconsin also has a sizable infestation which is not being controlled, and neighboring states are now being infested as a result. Seattle's 1978 infestation in the suburbs of Renton was also not controlled. Vancouver, B. C. has failed to take effective measures against them there, and more than 30 adult males were trapped in Salem, Oregon (in 1980) during the early part of the summer. All of these data are disturbing, because they indicate the probability that California will ultimately be infested again. Judging from the very strong opposition by the public, the Santa Clara County Board of Supervisors, and the city councils of 12 cities in Santa Clara County against any aerial application of any pesticide (even the innocuous malathion bait applications needed to kill an on-going infestation of Mediterranean Fruit Flies), it seems unlikely that any future widespread infestations of any insect pest can ever again be effectively controlled in that part of the state. Future Gypsy Moth invasions are likely to become massive and to remain uncontrollable in California.

"At the time this research project was started, the intent was to learn which California plants were suitable hosts for Gypsy Moth larvae and which plants would be rejected. During the next invasion then, it would be easier for inspection teams to locate infested trees without wasting time examining trees which are known to be distasteful to the larvae of these pests. Presumably, the infested plants would then be thoroughly sprayed and the pests eradicated more easily. It now appears unlikely that eradication can be realized in the future. Hopefully, the host preference data will still be of some value.

"Objective: The Gypsy Moth Research Project was sponsored by the California Department of Food and Agriculture for the following reasons:

"1. To determine which California plants (natives, crop producers, or ornamentals) are the most likely to serve as adequate hosts for these pests when they again reach this state;

"2. to test the ability of very young (neonate) larvae of the species to feed, survive, and grow upon various plants which more mature larvae are known to be capable of utilizing for development; and

"3. to learn how successful the pupae and adults are after they develop from larvae which were fed upon various plants that are of special significance to Californians.

"This third category must also include testing of both sexes of adults to determine if there is reduced fertility or fecundity, and observations of the sex ratio resulting from larvae that were nurtured by the various plants under investigation.

"This has been a most interesting study for the investigators, and both Dr. Fusco and Dr. Edwards have a continuing interest in the project. In his letter of March 4, 1981, sent with the Table of Data (Appendix III), and the results of his most recent screening tests with third instar larvae, Dr. Fusco stated, 'I wasn't able to meet the objective of rearing several generations on the selected plants because of the long developmental times; however, I believe the data tell us what we wanted to know. **There doesn't appear to be** any point of continuing this particular line of study. If you or Dr. Siddiqui want to see any of this work repeated or continued, I will gladly do it on my own time, at no cost -- I enjoyed doing the work, and found it most interesting.' (Emphasis added) 'I concur, and I share Dr. Fusco's interest. If there are additional lines of research that can be done with existing facilities, so that the only cost involved is in time and energy, I hope Dr. Siddiqui will make his wishes known!'

"Throughout this lengthy research project, we have enjoyed great cooperation and support from many employees of the California Department of Food and Agriculture, but especially from Dr. Isi Siddiqui. It was his idea to engage in this line of investigation, so that the Department will be better prepared for the future invasion of Gypsy Moths when it reaches California. I am very grateful for the opportunity to work with him, Don Henry and Dorothea Zadig on so vital a project. I have also appreciated the unique opportunity to share this research with my Pennsylvania colleague, Dr. Robert Fusco, who actually performed most of the time-consuming laboratory work on the project, and supplied me with all of his carefully calculated data. The spirit of cooperation between our Departments impressed me very highly!" /s/ J. Gordon Edwards

The findings of this study are that Gypsy Moths can survive on manzanita and eucalyptus. Both of these plants have a tremendous importance in the California landscape, especially the manzanita, as watershed vegetation. It cannot be assessed in advance how much damage the Gypsy Moth could do if it established itself in California. The damage would run into billions of dollars, due to flood, should manzanita disappear from the California landscape.

We have many examples to evaluate the importance of protecting California from an influx of insect pests. Just think of the Khapra Beetle eradication 25 years ago, and the many in between. Most have been successful, as we will be with the Medfly problem. **There is little doubt that the Gypsy Moth may be found in** the State. Is it just a matter of time until it will be established in the Golden State?

IMPORTANT INSECT FINDS

A great number of miscellaneous insect pests have been sent to the Insect Taxonomy Laboratory during the past 30 days. **Among these, the following** "A" and "Q"-rated pests were recognized:

GYPSY MOTH (*Lymantria dispar*) -- On April 13, J. Ellis found a pupal case of this A-rated pest on a garden hose shipped from New Jersey to Orange County. Collector did not give locality of the data submitted. Det. by R. Somerby.

Additional finds reported from the following locations:

Orange County -- On April 13 and 14, J. Ellis reported two collections in a moving company's warehouse. Egg masses, larvae and pupae found on a wooden chest shipped from New Hampshire and stored in Newport Beach.

On April 27, J. Ellis found another pupae case in Costa Mesa.

San Bernardino County -- On April 27, G. Dearmin reported, "Oak leaves in a dog house; 5 adults per sq. yd; moved from New Jersey to Chino".

Santa Clara County -- On April 14, D. Schamberger located egg masses, larvae and pupae on a picnic table in Cupertino and shipped from New York. The same day,E. Winkler and D. Schamberger found additional egg masses, larvae and pupae, in Los Gatos, in a dog house and canoe, shipped from Massachusetts.

On April 27, S. Gilmour found an egg mass and pupal case on the underside of a branch in Saratoga, shipped from New Jersey.

Marin County -- On April 9, J. Schrock found egg masses, larvae and pupae on miscellaneous household goods and on a bicycle shipped from Massachusetts.

On May 5, J. Schrock and P. S. Crane located larvae and egg masses on garden furniture in Novato, shipped from Connecticut.

Contra Costa County -- On April 29, V. Guise of Oakly found egg masses, larvae and pupae on an aluminum ladder, swing set, milk cases, picnic table, etc., shipped from Connecticut. **Mr. Guise enclosed the following remarks with the** specimens he sent us: "Found 15-20 egg masses. Three egg masses were in the process of hatching out. Numerous live first instar larva. Some found on the ground and in weeds, in the vicinity of the hatch. This is a new housing area with very little host material within 200 yards of the property. Yard sprayed with Sevin. Visual survey conducted". We hope the wind did not disperse some of those first instar larvae. Det. by T. Eichlin.

HOLLY LEAFMINER (*Phytomyza ilicis*) -- The Mt. Shasta Inspection Station intercepted cut holly in two automobiles; one on April 17 from Oregon, en route to Red Bluff by D. Bunenfeld; the other on April 27 from Washington to Sacramento by R.C.Barbour. Det. by K. Corwin.

COCONUT SCALE (Aspidiotus destructor) -- On April 8, M. Croce found eggs, nymphs and adults of this scale in a nursery in Lodi on an Areca palm (shipped from Hawaii). Det. by R. Gill.

A SCALE (Acutaspis decorosa) -- On April 13, G. Foster found this Q-rated pest on the petioles of Tillandsia punctulata in Temecula (Riverside Co.), on private property. The plant was shipped from Michigan (originating in Mexico). Det. by R. Gill.

FLORIDA WAX SCALE (Ceroplastes floridensis) -- On May 7, Mr. Kellan of Gardena (L. A. Co.) found that a Schefflera arbolicola (in a nursery, and of Florida origin) produced an average of 20 nymphs and adults per leaf. Det. by R. Gill.

RED WAX SCALE (Ceroplastes rubens) -- On April 28, Mr. Boch found an infestation on an Aglaonema plant, in a nursery in Encinitas (San Diego Co.). Adults and nymphs were present. The origin of the plant was traced to Hawaii. Det. by R. Gill.

A SCALE (Coccus capparidis) -- On April 13, George Nash found this Q-rated, quarantine pest on an orange and lemon, in Perris (Riverside Co.). Det. by R. Gill.

CLOUDYWINGED WHITEFLY (Dialeurodes citrifolii) -- On April 14, G. Nash found nymphs and adults of this quarantine pest on orange and lemon plants, in Perris (Riverside Co.).Det. by R. Gill.

A SCALE (Diaspis sp.,undescribed) -- On April 13, G. Foster found an average of two adults on leaf and petioles of Tillandsia rothii. Origin of plant was traced to Mexico. Det. by R. Gill.

RASPBERRY ROOT GALL WASP (Diastrophus radicum) -- On April 8, J. Bauer found larvae of this Q-rated pest in roots of raspberry and blackberries,in Boulder Creek (Santa Cruz Co.). The plants were originally shipped by a nursery in South Dakota. Det. by M. Wasbauer.

On April 29, J. Bauer found another cynipid wasp of the same genus on blackberries (larvae in the roots),in Boulder Creek. The origin of the plant was traced to South Dakota. Det. by M. Wasbauer.

MACKENZIE'S MEALYBUG (Dysmicoccus mackenziei) -- On April 13,G. Foster of Temecula (Riverside Co.) found nymphs and adults of this Q-rated pest on the petioles of Tillandsia butsii (shipped from Michigan). Specimens previously imported from Mexico. Det. by R. Gill.

MINING SCALE (Howardia biclavis) -- On April 21, J. Dyer of Hawthorne (L. A. Co.) found that this quarantine pest averaged 10 adults per stem on Ficus benjamina. Det. by R. Gill.

A WHITEFLY (Aleurodicus dispersus) -- Two collections were made of this Q-rated pest in Lodi (San Joaquin Co.). On April 8, M. Croce collected all stages of this pest on an Areca palm. On May 5, S. Hudson found eggs and nymphs on the leaves of Tupidanthus. Both of the host plants were shipped from Hawaii to three different nurseries. Det. by R. Gill.

TENT CATERPILLAR (Malacosoma sp.) -- On April 29, C. Olson of Arcadia (L.A. Co.) found pupae on an oak and maple log (brought into the State from Massachusetts).

On May 5, another collection of pupae was found by Masuda and Cupp of Santa Maria (Santa Barbara Co.) on a lawn chair, recently moved from Massachusetts.

On April 17, H. Struffenegger of San Mateo (San Mateo Co.) found two collections of eggs and pupae.

On April 27, Gail Raabe found eggs and pupae on a folding chair and in a dog house, shipped from Connecticut and Pennsylvania. Det. by R. Somerby.

On April 14, K. G. Harvey found a cocoon, possibly from the M. americanum sp., on redwood lawn furniture. Origin of furniture traced to recent shipment from New Jersey. Det. by T. Eichlin.

WEST INDIAN FLATID (Melormenis antillarum) -- On May 8, Papilli found adults of this Q-rated pest on cut foliage in La Habra (Los Angeles Co.). Determination made that host recently had been brought to area from Hawaii. Det. by R. Gill.

EUROPEAN CORN BORER (Ostrinia nubilalis) -- On April 22, H. Auki found larva in Cargill Mills, in Fresno (Fresno Co.) and brought in from Nebraska. (All collections in grain or milling company's warehouses.) Det. by R. Somerby.

On April 10, D. Haines and R. Miyake (Tulare Co.) found larvae in the Far-Mar Company warehouse.

On April 14, Miyake and Russell (Tulare Co.) collected 5 larvae.

On May 5, Russell, Miyake and Bragg found additional larvae at the Pillsbury Co. lot.

All of the above found in corn from Nebraska. Det. by T. Eichlin.

PALM MEALYBUG (Palmicultor palmarum) -- On May 8, R. Skalsi of San Luis Obispo Co. (no locality data supplied by collector) found three nymphs and adults per leaf of Heliconia. Plant imported recently from Hawaii. Det. by R. Gill.

MAY BEETLE (Phyllophaga sp.) -- On April 15, R. Padoni found an adult in lawn grass plugs in Trinidad (Humboldt Co.). Imported from Lakeland Nursery Sales, Kansas. Det. by F. Andrews.

LESSER SNOW SCALE (Pinnaspis strachani) -- On April 8, M. Croce reported that in Lodi (San Joaquin Co.), an Areca palm produced several eggs, nymphs and adults of this A-rated pest.

On April 7, Freshour of San Luis Obispo (San Luis Obispo Co.) found specimens.

On April 30, R. Hopkins found specimens on Cocos nucifera plants imported from Hawaii. Det. by R. Gill.

MAGNOLIA WHITE SCALE (Pseudalacaspis cockerelli) -- On April 13, Kellam reported an Areca palm in Torrance (Los Angeles Co.) which produced an average of 12 adults of this A-rated scale.

On April 21 and May 1, Ziegler and Sparkman reported two collections in Richmond (both in Contra Costa County). In all cases (Los Angeles and Contra Costa Counties), plants were located in nurseries and shipped by the same shipper, Meristen Valley Nursery, Homestead, Florida. Det. by R. Gill.

GREEN SHIELD SCALE (Pulvinaria psidii) -- On April 8, M. Croce of Lodi (San Joaquin Co.) found eggs and adult on Ficus benjamina. Host originated in Hawaii. Det. by R. Gill.

A BUG (Rhytidoporus indentatus, Hemiptera: Cydnidae) -- On April 8, D. Papilli of Whittier (Los Angeles Co.)found three nymphs of this Q-rated pest per root on Chamaedorea elegans. The plant was originally shipped to Whittier from Hawaii. Det. by A. Hardy.

FIRE ANT (Solenopsis geminata) -- On April 20, Mr. Kellan reported from Hawthorne (Los Angeles Co.) that he counted 12 adults per root of Ficus benjamina. This plant was shipped to the nursery from Alamo Tropicals, Texas. Det. by M. Wasbauer.

COOPERATION BETWEEN PARTIES INVOLVED is important to stop GYPSY MOTH from invading California, as reflected in one of the "Exclusion Alerts" issued by Howard Ingham from the Sacramento Office:

Orange County reports finding two separate shipments of household goods to be infested with Gypsy Moth egg masses and emerging larvae.

One shipment came from New Hampshire last week and was put into storage. The owners went to the warehouse to pick up part of the shipment and found the egg masses and larvae. Visible egg masses and larvae were removed in the parking lot, before taking the items home with them. Fortunately, the moving company agent notified the Orange County Agricultural Commissioner's Office, and an immediate follow-up was made to the warehouse and residence where more larvae and egg masses were found.

A second shipment of household goods from New Jersey also was found infested with Gypsy Moth egg masses and emerging larvae at a residence on a routine "Warning-Hold For Inspection" call.

In both cases, Orange County utilized the San Juan Capistrano Gypsy Moth Project spray crew to eradicate the pest and treat the surrounding areas.

The finding of emerging larvae in Orange County shows that we are now in a high-risk period for Gypsy Moth and inspection of incoming shipments of household goods from the infested areas should be made as soon as possible. We can expect egg hatch until June 15 up to July 1, and adult activity until August 15 up to September 1.

Arizona and California border stations have been requested to mail the Gypsy Moth Warning Notices on a daily basis.

CALIFORNIA BLACK LIGHT TRAP REPORT

For the week ending 5/8/81

DATE	5/3/81	5/3/81	5/4/81	5/5/81	
LOCATION	Bellota	Roberts Island	Escalon	Manteca	
TEMPERATURE				78 - 46	
ALFALFA LOOPER *Autographa californica*	3	2	1	1	
ARMYWORM *Pseudaletia unipuncta*	27	12	33		
BEET ARMYWORM *Spodoptera exigua*		4			
BLACK CUTWORM *Argrotis ipsilon*	2	3	3	6	
CABBAGE LOOPER *Trichoplusia ni*					
CLOVER CUTWORM *Scotogramma trifolii*	91	2	26		
CODLING MOTH *Laspeyresia pomonella*					
CORN EARWORM, (ETC.) *Heliothis zea*			2		
FALSE CELERY LEAFTIER *Udea profundalis*	7	2		1	
GRANULATE CUTWORM *Feltia subterranea*	1	1	14	21	
SALTMARSH CATERPILLAR *Estigmene acrea*					
SPOTTED CUTWORM *Amathes c-nigrum*	57	1	8	2	
SUGARBEET WEBWORM *Loxostege sticticalis*	1				
TOBACCO BUDWORM *Heliothis virescens*					
W. YELLOWSTRIPED ARMYWORM *Spodoptera praefica*	17	4			
NAVEL ORANGE WORM Amyelois transitella	1			1	
VARIEGATED CUTWORM Peridroma saucia	7	1	1		
ROUGHSKINNED CUTWORM Proxenus mindara	13	4			
PEACH TWIG BORER Anarsia lineatella	1		1	3	

61-033 (Est. 5-77)

CALIFORNIA BLACK LIGHT TRAP REPORT

For the week ending 5-15 and 5-22

DATE	5-10	5-10	5-17	5-17	5-20
LOCATION	Manteca	Roberts Island	Bellota	Roberts Island	Manteca
TEMPERATURE	91-60				78 - 46
ALFALFA LOOPER *Autographa californica*	6	3	2	4	
ARMYWORM *Pseudaletia unipuncta*	6	11	5	1	
BEET ARMYWORM *Spodoptera exigua*	2		2		2
BLACK CUTWORM *Argrotis ipsilon*	8	4	3	2	1
CABBAGE LOOPER *Trichoplusia ni*					
CLOVER CUTWORM *Scotogramma trifolii*	6	2	13		
CODLING MOTH *Laspeyresia pomonella*					
CORN EARWORM, (ETC.) *Heliothis zea*					
FALSE CELERY LEAFTIER *Udea profundalis*	2	4		2	
GRANULATE CUTWORM *Feltia subterranea*	48		2	4	20
SALTMARSH CATERPILLAR *Estigmene acrea*	1				
SPOTTED CUTWORM *Amathes c-nigrum*	3		1	1	
SUGARBEET WEBWORM *Loxostege sticticalis*					
TOBACCO BUDWORM *Heliothis virescens*					
W. YELLOWSTRIPED ARMYWORM *Spodoptera praefica*	2	5	2		
OMNIVOROUS LEAFROLLER Platynota stultana	1	2			
PEACH TWIG BORER Anarsia lineatella	21	2			
NAVEL ORANGEWORM Amyelosis transitella	11				1
GRAPE LEAF FOLDER Desmia funeralis	1				
VARIEGATED CUTWORM Peridroma saucia	3				

61-033 (Est. 5-77)