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Cooperative
**ECONOMIC INSECT
REPORT**

Issued by

PLANT PROTECTION DIVISION

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PROTECTION DIVISION

ECONOMIC INSECT SURVEY AND DETECTION

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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The Editors, CEIR
Economic Insect Survey and Detection
Plant Protection Division, ARS, USDA
Federal Center Building
Hyattsville, Maryland 20782

COOPERATIVE ECONOMIC INSECT REPORT**HIGHLIGHTS**Current Conditions

SPOTTED ALFALFA APHID heavy on alfalfa and BROWN WHEAT MITE heavy on wheat and barley in Oklahoma. (p. 260).

AN ARMORED SCALE heavy on citrus in Florida. (p. 262).

Parasitism by a BRACONID heavy in greenbug infested wheat in Oklahoma. (p. 264).

Predictions

ALFALFA WEEVIL damage expected to be heavy in Virginia (p. 261). FOREST TENT CATERPILLAR defoliation expected along Ohio River in West Virginia (p. 263). SOUTHERN PINE BEETLE damage expected in Virginia, Maryland, and Delaware (p. 273). MOUNTAIN PINE BEETLE damage expected to continue during 1971 in South Dakota (p. 276). JACK PINE BUDWORM potential for heavy infestation exists in northwest Wisconsin (p. 277). FALL WEBWORM predicted to be heavy again in Missouri (p. 282). FALL CANKERWORM infestations expected to be heavy in North Dakota (p. 283).

Detection

New State records include GREENBUG from Oregon (p. 259) and a MIDGE from Wyoming (p. 263).

For new county records see page 265.

Special Reports

Summary of Insect Conditions in the United States - 1970.

Ornamentals (pp. 267-271).

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Contributors (p. 288).

Distribution of Bagworm. Map. (p. 268).

Distribution of European Pine Sawfly. Map. (p. 278).

Some First Occurrences of Season

ARMYWORM moths in Missouri. PEAR PSYLLA adults in Michigan and Connecticut. CANKERWORM moths in Michigan, North Dakota, and Connecticut.

Reports in this issue are for the week ending April 9 unless otherwise indicated.

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WEATHER OF THE WEEK ENDING APRIL 12

HIGHLIGHTS: Temperatures averaged above normal over the West and north-central parts of the Nation and cooler than normal over the East and Deep South. Little or no rain fell in the Southwest or over the Great Plains. Drought intensified in the southern Great Plains and in southern Florida.

PRECIPITATION: Sunny, cloudless skies prevailed over most of the Nation last week. Rainfall totals exceeded 4 inches along portions of the Oregon coast. Light precipitation fell elsewhere in the Pacific Northwest. Significant rain fell from the Mississippi River to the Atlantic coast, with totals exceeding 1 inch along the coast from southern New England to central Florida. A large area from Montana to California and eastward to the Mississippi River received no rain or only widely scattered light sprinkles. Much of this area is becoming very dry. Drought in southern Florida is also intensifying. A low pressure system over the eastern portion of the Gulf of Mexico on Monday crossed the Florida Peninsula and moved northward along the Atlantic coast during the week. Rain fell and a few thunderstorms occurred from Mississippi to Florida and the Carolinas on Monday. Strong gusty winds blew along the coast. Rain fell from the lower Ohio River Valley to the Middle and Southern Atlantic Coastal States and heavy snow blanketed portions of Missouri and Illinois. Snow accumulated to 13 inches at Belleville, Illinois, a short distance east of St. Louis, Missouri. Heavy wet snow stalled traffic, closed schools, and broke trees and power lines. Snow fell from the Ozark Mountains to Tennessee and northeastward to New England. High winds and rain occurred along the northern and middle Atlantic coast. Winds gusted 50 to 60 m.p.h. at Cape Hatteras, North Carolina, Tuesday and to 78 m.p.h. at Marthas Vineyard, Massachusetts, Wednesday. Two feet of snow covered the ground at Doughton Park, Virginia, and 1.5 feet had fallen at Montebello, Virginia, by noon Wednesday, before moving out of the country late Wednesday. A large high pressure moved southward over mid-America during the early part of the week. Monday, it was centered over southern Minnesota. By late Wednesday, it had moved to the

Weather of the week continued on page 287.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

ARMYWORM (Pseudaletia unipuncta) - MISSOURI - Adults observed at Columbia, Boone County, on April 1. (Craig).

ARMY CUTWORM (Euxoa auxiliaris) - OKLAHOMA - Larvae per 10 linear feet ranged 0-3 in most wheat in southern Garfield County; 0-1 in Cleveland County field; 0-5 in alfalfa planted last fall in Okeene area, Blaine County. (Okla. Coop. Sur.). KANSAS - Larvae 30 per 100 row feet of wheat in Comanche County field. Negative in wheat in other areas surveyed in southeast and south-central districts. (Bell). NEBRASKA - Mostly third to fifth instars averaged less than 1 per linear feet in 35 fields in Perkins, Chase, Dundy, and Cheyenne Counties April 6 and 8. (Keith, Sakurada). WYOMING - Trace in 1 of 5 alfalfa fields near Wheatland, Platte County. (Bitner). COLORADO - Larvae ranged 0-1 per linear foot of wheat in Weld, Larimer, and Logan Counties. Feeding damage very light to date. (Johnson).

ASTER LEAFHOPPER (Macrosteles fascifrons) - OKLAHOMA - Leafhopper adults and nymphs, mainly this species, ranged 30-50 per linear foot of wheat in Oklahoma and Cleveland Counties. (Okla. Coop. Sur.).

BEEET LEAFHOPPER (Circulifer tenellus) - CALIFORNIA - Populations variable due to climatic conditions. Nymphs of different instars present as well as spring adults. About 34,948 acres of rangeland treated in Kings and Kern Counties. Pretreatment counts heavy and potentially damaging to croplands. Mortality counts ranged 65 to 94 percent. Wide dispersal of overwintering leafhoppers complicated treatment and added to areas needing treatment. Uneven hatch and development created problems. (Cal. Coop. Rpt.).

CORN LEAF APHID (Rhopalosiphum maidis) - MISSOURI - Ranged 0-5 per linear foot of barley in southeast area. (Munson). NEVADA - This species and Schizaphis graminum (greenbug) light on barley starting to head at Las Vegas, Clark County. Infestations had been heavier, but heavy numbers of lady beetle larvae reduced corn leaf aphid and greenbug populations. (Hilbig et al.).

GREENBUG (Schizaphis graminum) - OREGON - Nymphs collected on volunteer barley in wheatfield near Helix, Umatilla County, by K.J. Goeden and R.L. Penrose, December 15, 1970. Specimens reared to adults in laboratory on perennial ryegrass. Determined by R. Berry, confirmed by L.M. Russell. This is a new State record. (Penrose). ARIZONA - Surveys of barley and wheat negative in Graham County. Population level same as period March 15-19 at Kansas Settlement and controls applied to 1 field at Bonita, Cochise County. (Ariz. Coop. Sur.). TEXAS - Ranged 10-3,000 per row foot of wheat in 8 panhandle counties on April 5. Heaviest count in Deaf Smith County. (Daniels). OKLAHOMA - Averaged 1,000 per linear foot in wheatfield near Seiling, Dewey County. Ranged 50-150 per linear foot in 3 southeastern Major County fields. Ranged 3-40 per linear foot in Payne, Garfield, Cleveland, and Oklahoma Counties. Moderate in Kingfisher and Woodward Counties; light in Murray, Kay, and Texas Counties. Parasites and predators increased in most areas. (Okla. Coop. Sur.). KANSAS - Averages per row foot of wheat by county (3 fields per county): Cherokee none; Labette none; Montgomery 0-1; Chautauqua 0-5; Cowley 0-0.7; Sumner 0-1.7; Harper 1.3-3.3; Barber 0-19; and Comanche 0.3-0.7. (Foster). None found in wheat surveyed in Greeley, Wallace, Wichita, Lane, Scott, Gove, Thomas, and Ellis Counties. (Martinez). NEBRASKA - Negative on wheat surveyed in southwest and panhandle districts April 6 and 8. (Keith, Sakurada). MISSOURI - Ranged 0-8 per linear foot of barley in southeast area. (Munson). ARKANSAS - This and other aphids light to medium on small grain in various areas. (Boyer et al.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - NEVADA - Occasional specimen found on alfalfa at Las Vegas, Clark County. (Hilbig et al.). OKLAHOMA - Heavy on alfalfa in Cotton County, moderate to heavy in Garvin County, and moderate in Kingfisher County. Ranged 50-200 per linear foot of young alfalfa in Blaine

County, 0-20 per square foot in Cleveland and Oklahoma Counties. Heavy throughout most of southwest area. (Okla. Coop. Sur.). NEW MEXICO - Infestations spotty in seedling alfalfa in northern Eddy and Chaves Counties; counts light to 500+ per square foot. (Mathews). ARKANSAS - Light on alfalfa in Lafayette County. (Ark. Ins. Sur.).

CORN, SORGHUM, SUGARCANE

EUROPEAN CORN BORER (*Ostrinia nubilalis*) - IOWA - Survey shows overwintering survival of 5,972 borers per acre in Boone County, an increase of 20 percent over 1970 spring survey. (Iowa Ins. Sur.).

SMALL GRAINS

BROWN WHEAT MITE (*Petrobia latens*) - UTAH - Present on wheat in "Dixie" area of Washington County. (Huber). NEVADA - Chemical controls applied to about 200 acres of wheat and irrigation used to control remaining heavy infestations at Lovelock, Pershing County. (Stitt). OKLAHOMA - Heavy on wheat in Woodward and Texas Counties; light to moderate in Cimarron, Major, Garfield, Kingfisher, and Oklahoma Counties. Egg laying continues in Major County. Heavy on barley in Garfield County. (Okla. Coop. Sur.). KANSAS - Light on wheat in Wallace, Wichita, and Greeley Counties. (Martinez). Ranged 0-1.3 per row foot in Comanche County. (Foster).

WINTER GRAIN MITE (*Penthaleus major*) - OKLAHOMA - Ranged 0-15 per linear foot of wheat in 3 western Payne County fields. (Okla. Coop. Sur.).

PALE WESTERN CUTWORM (*Agrotis orthogonia*) - WYOMING - None found in 12 wheatfields in Goshen and Laramie Counties. (Bitner). NEBRASKA - Larvae ranged 0-3 per linear foot of small grains in 8 Kimball County fields March 30. (Hagen). Development about 10 days behind 1970 in southwest district. Most in second and third instars on April 6 and 8. Injured plant crowns ranged up to 6 per linear foot in 14 Perkins County fields; heaviest infestations in southeastern portion of county. In Chase County, heaviest infestations in northeast area. No injury noted in Dundy County. Injured plants 1-2 per foot in 2 of 6 Cheyenne County fields. (Keith, Sakurada).

AN APHID (*Rhopalosiphum padi*) - OKLAHOMA - Ranged 10-15 per linear foot of wheat in 2 of 3 southeast Major County fields. Averaged 1 per linear foot in western Payne County field and in field in Noble area of Cleveland County. (Okla. Coop. Sur.).

TURF, PASTURES, RANGELAND

RANGE CRANE FLY (*Tipula simplex*) - CALIFORNIA - Adults resting on soil in 300-acre area of range grass at Exeter, Tulare County. Earlier, larvae caused much damage to range grasses in other parts of county. (Cal. Coop. Rpt.).

CHINCH BUG (*Blissus leucopterus leucopterus*) - INDIANA - One specimen in 23 grass samples collected from 5 northwest and west-central counties and 5 northeast and east-central counties. (Meyer). OKLAHOMA - First of season reported damaging bentgrass golf greens at Clinton, Custer County. (Okla. Coop. Sur.).

FORAGE LEGUMES

ALFALFA WEEVIL (*Hypera postica*) - OREGON - Adults averaged 1 per 25 sweeps of alfalfa near Corvallis, Benton County, April 2. (Larson, Penrose). UTAH - Adults left field litter in Cache County, migrated into 2-inch tall alfalfa. (Davis). COLORADO - Adults mating and few eggs laid. (Cross). OKLAHOMA - Larvae averaged 1 per terminal in 18 percent of terminals in Cleveland County and on 4 percent of terminals in Oklahoma County. Ranged 0-5 per linear foot in young alfalfa in Okeene area, Blaine County. These are new county records. Larvae ranged 40-50 per

square foot of alfalfa in Le Flore County. Continued heavy in most south-central counties and in scattered southeast, east-central, and southwest counties. Continues heavy in Bryan County, but damage declining. (Okla. Coop. Sur.). MISSOURI - Tip damage ranged 18-41 percent in southeast area. Larvae ranged 4-14 (averaged 8) per 10 alfalfa stems in south-central area; 80 percent in first instar, 20 percent in second. (Munson). ILLINOIS - Development ahead of 1970 in southern half of State. (Ill. Ins. Rpt.). INDIANA - Larvae 0-37 (averaged 10) per square foot in 27 one-square-foot samples of alfalfa from 7 fields in southwest district. Ratio of first and third instars, 6:4. (Meyer). MARYLAND - First larvae of season at Easton, Talbot County, and at Centerville, Dorchester County. Infestation below 5 damaged tips per 100. (U. Md., Ent. Dept.). VIRGINIA - Eggs hatched in Orange and Loudoun Counties. First instars light on April 5 and 6. Damage expected to be heavier than past two seasons. (Allen). KENTUCKY - Eggs averaged 205 per square foot in Fayette County. About 25 percent of alfalfa tips damaged by first and second instars. Larvae in Madison County on April 6. (Barnett). TENNESSEE - Slight increase in weevil activity in alfalfa surveyed in central areas; damage light. (Gordon). ARKANSAS - Hatch continues and early instars found in earlier treated fields. (Boyer, Kimbrough). First field treated for season in Chicot County. (Boyer, Wall).

WEEVILS (Hypera spp.) - NEVADA - Larvae of H. brunneipennis or H. postica averaged 10 per sweep on 200 acres of alfalfa hay at Las Vegas, Clark County. First time in about 40 years that weevil larvae found damaging alfalfa in Clark County. (Hilbig et al.).

CLOVER LEAF WEEVIL (Hypera punctata) - INDIANA - Larvae 0-16 (averaged 4.5) per square foot in 27 one-square-foot samples from 7 alfalfa fields in southwest district. (Meyer). WISCONSIN - Larvae averaged 3 per square foot of young alfalfa in Dane County field; some damage. (Wis. Ins. Sur.).

MEADOW SPITTLEBUG (Philaenus spumarius) - INDIANA - Nymphs averaged 3 per square foot in alfalfa in Dubois County field heavily infested during 1970. (Meyer).

CLOVER LEAFHOPPER (Aceratagallia sanguinolenta) - KENTUCKY - Averaged 30 per 100 sweeps of clover in central areas. (Barnett).

PEA APHID (Acyrtosiphon pisum) - INDIANA - Apterae ranged 0-12 in 10 of 27 one-square-foot samples of alfalfa in southwest district fields. (Meyer). OKLAHOMA - Heavy on alfalfa in Texas County. Moderate in Murray and Kingfisher Counties; light in Coal and Pontotoc Counties. Averaged 40 per square foot of alfalfa in Cleveland and Oklahoma Counties; 10 per linear foot of young alfalfa in Blaine County. (Okla. Coop. Sur.).

COWPEA APHID (Aphis craccivora) - OKLAHOMA - Ranged up to 15 per stem of alfalfa on occasional stems in Jones area of Oklahoma County. (Okla. Coop. Sur.).

POTATOES, TOMATOES, PEPPERS

GREEN PEACH APHID (Myzus persicae) - CALIFORNIA - Counts of 3 per tomato leaf in 40-acre planting at Calipatria, Imperial County. (Cal. Coop. Rpt.). NEW MEXICO - Heavy and damaged greenhouse tomatoes at Los Chavez, Valencia County. (Heninger).

COLE CROPS

CABBAGE APHID (Brevicoryne brassicae) - CALIFORNIA - Ranged 10-20 per stem on 125 acres of rape grown for oil at Holtville, Imperial County. (Cal. Coop. Rpt.).

DECIDUOUS FRUITS AND NUTS

PEAR PSYLLA (Psylla pyricola) - CONNECTICUT - Few adults noted at Storrs, Tolland County, on April 2; no eggs yet. (Savos). MICHIGAN - Adults active in southern counties. Egg laying will start if predicted weekend temperatures of 55-65° F. occur. (Sauer). WASHINGTON - First hatch on pear in tight cluster stage of bud development near Buena, Yakima County, April 1. (Johnson).

OYSTERSHELL SCALE (Lepidosaphes ulmi) - CALIFORNIA - Moderate on apple trees at Santa Maria, Santa Barbara County. Scarce during previous years; increased in occurrence on various plants in many locations. (Cal. Coop. Rpt.).

EASTERN TENT CATERPILLAR (Malacosoma americanum) - OKLAHOMA - Damage light to peach trees in Washington, Cleveland, and Choctaw Counties. Small tents very heavy on wild plum in southeast Major County. (Okla. Coop. Sur.).

A LYGUS BUG (Lygus hesperus) - WASHINGTON - Counts of 2 per 6 trays and caused extensive bud damage on pears and apples 12 days after spray applications in Yakima County. (Gregorich).

APPLE APHID (Aphis pomi) - MISSOURI - Eggs hatching and nymphs numerous (50-100 per bud) in central area commercial orchards. (Enns). KENTUCKY - Averaged 10.7 (ranged 0-29) per bud on apple. (Barnett).

OLIVE SCALE (Parlatoria oleae) - CALIFORNIA - Ranged 7-14 per limb on almond trees at Orland, Glenn County. Parasites introduced for control in this area. This scale infested 5-acre almond orchard at Winters, Yolo County. (Cal. Coop. Rpt.).

CITRUS

Citrus Insect Situation in Florida - End of March - CITRUS RUST MITE (Phyllocop-truta oleivora) infested 76 (norm 60) percent of groves; economic in 53 percent. Population expected to decrease in April; will be in high range and above normal most of month. Highest districts west, south, and north. CITRUS RED MITE (Panonychus citri) infested 46 (norm 43) percent of groves; economic in 15 (norm 17) percent. Population near normal and in low range. Increase expected in April, gradual buildup in all districts. Highest district south. TEXAS CITRUS MITE (Eutetranychus banksi) infested 38 (norm 35) percent of groves; economic in 12 (norm 15) percent. At normal low level of abundance in March. Will increase in April, with probability of scattered heavy infestations in most districts. Highest districts south and central. SIXSPOTTED MITE (Eotetranychus sexmaculatus) infested 6 (norm 9) percent of groves; economic in 1 (norm 1) percent. Slight increase expected. PURPLE SCALE (Lepidosaphes beckii) infested 78 (norm 79) percent of groves; economic in 5 (norm 10) percent. Population will remain below normal and moderate. Highest district north. CHAFF SCALE (Parlatoria pergandii) infested 61 (norm 65) percent of groves; economic in 2 (norm 12) percent. Population will remain below normal and low. Highest district south. YELLOW SCALE (Aonidiella citrina) infested 36 (norm 65) percent of groves; none economic (norm 12) percent. Will remain below normal in abundance and unimportant. Highest district east. BLACK SCALE (Saissetia oleae) infested 18 (norm 29) percent of groves; economic in 2 (norm 11) percent. Population expected to remain below normal and low through May. Highest district west. An ARMORED SCALE (Unaspis citri) infested 29 percent of groves; economic in 19 percent. Population heavier than any prior month and will increase. APHIDS infested 22 (norm 24) percent of groves; economic in 1 (norm 1) percent. Increase will be rapid until mid-April, then decrease. In groves defoliated by cold, aphids will occur on new growth through May. WHITEFLY adult population will increase to a high level normal for April peak, then decrease. (W.A. Simanton (Citrus Expt. Sta., Lake Alfred)).

AN ARMORED SCALE (Unaspis citri) - FLORIDA - Severe on variety of citrus trees at grove in Ft. Pierce, St. Lucie County, March 31. (Kendrick).

CITRUS THRIPS (Scirtothrips citri) - ARIZONA - Present at Deer Valley and Chandler Heights areas, Maricopa County. Being watched for buildup. (Ariz. Coop. Sur.).

LEAFHOPPERS - ARIZONA - Empoasca spp. and Erythroneura spp. problem in some groves at Chandler Heights, Maricopa County, past few weeks. Controls applied. (Ariz. Coop. Sur.).

OTHER TROP. & SUBTROP. FRUITS

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) - CALIFORNIA - Nymphs 10 per leaf on avocado nursery stock at Madera, Madera County. (Cal. Coop. Rpt.).

ORNAMENTALS

COOLEY SPRUCE GALL APHID (Adelges cooleyi) - OREGON - First eggs of season on Alberta spruce March 31 at Gresham area nursery, Multnomah County. (Nicolaison).

A CONIFER APHID (Cinara tujaefilina) - OKLAHOMA - Populations increased on arborvitae in Payne County during past 21 days. Winged adults common for first time this season. Moderate to heavy on evergreens in Cleveland County. (Okla. Coop. Sur.).

AN APHID (Eulachnus rileyi) - NEVADA - Medium on Aleppo pine (Pinus halepensis) nursery stock at Las Vegas, Clark County. (Hoff).

JUNIPER WEBWORM (Dichomeris marginella) - OREGON - Late instars damaged junipers at several Multnomah and Polk County nurseries. (Long, Nicolaison, Apr. 2).

A LEAFHOPPER (Fieberiella florii) - CALIFORNIA - Adults reared from calendula nursery stock at El Centro, Imperial County. F. florii is vector of yellow leaf roll of peaches; calendula is very common bedding plant. (Cal. Coop. Rpt.).

A GALL MIDGE (Mayetiola rigidae) - WEST VIRGINIA - Galls heavy on pussy willow shrubs in Raleigh County, March 17. Collected by E. Cochran. Determined by A.E. Cole. (W. Va. Ins. Sur.).

FOREST AND SHADE TREES

A MIDGE (Pinyonia edulicola) - WYOMING - Collected on pinyon pine at Laramie, Albany County, by E.W. Spackman August 5, 1970. Determined by R.J. Gagne. This is a new State record. (Bitner).

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana) - WISCONSIN - Overwintered in good condition on mugho pine and young red pine in southeastern counties. (Wis. Ins. Sur.).

CANKERWORMS - MICHIGAN - Alsophila pometaria (fall cankerworm) adults observed at several locations. Peak adult emergence of Paleacrita vernata (spring cankerworm) and fall cankerworm has not occurred in most areas. (Sauer). NORTH DAKOTA - P. vernata females emerged in Fargo area, Cass County, March 30, about 7 days earlier than in 1970. (Anderson). CONNECTICUT - P. vernata adults active past 2 weeks in Storrs area, Tolland County. (Savos).

EASTERN TENT CATERPILLAR (Malacosoma americanum) - TENNESSEE - First larvae of season on flowering quince in Cocke County. (Hammett).

FOREST TENT CATERPILLAR (Malacosoma disstria) - WEST VIRGINIA - Based on egg mass survey, noticeable defoliation predicted on 250,000 acres along Ohio River in Ritchie, Pleasants, Tyler, Wetzel, Marshall, and Ohio Counties. Egg mass counts: 8 in Pleasants County, 9 in Tyler County, 6 in Wetzel County, and 24 in Marshall County. Counts on ten 30-inch branch samples per plot. (W. Va. Ins. Sur., Mar. 22).

ELM CALLIGRAPH (Calligrapha scalaris) - KANSAS - One adult found on ground under American elm at Whitewater, Butler County. (Iselin).

MAN AND ANIMALS

SCREWWORM (Cochliomyia hominivorax) - Three cases reported in U.S. April 4-10 as follows: TEXAS - Duval, Starr, and Jim Wells. Total of 57 laboratory-confirmed cases reported in portion of Barrier Zone in Republic of Mexico as follows: Sonora 8, Chihuahua 12, Coahuila 2, Nuevo Leon 8, Tamaulipas 27. Total of 26 cases reported in Mexico south of Barrier Zone. Barrier Zone is area where eradication operation underway to prevent establishment of self-sustaining population in U.S. Sterile screwworm flies released: Texas 28,548,000; Arizona 3,820,000; Mexico 111,170,000. (Anim. Health Div.).

CATTLE GRUBS (Hypoderma spp.) - NORTH DAKOTA - Total of 1,316 head of cattle checked; 10 percent of animals infested. Grubs ranged 1-60 (averaged 6.5) per infested animal at 8 livestock auctions during period March 15 to April 2. This is decrease from 30-percent infestation found in 1970. However, 6.5 grubs per infested animal is increase from 4 grubs found last year. (Brandvik, Kaatz). KENTUCKY - H. lineatum (common cattle grub) larvae averaged 1.6 per animal on backs of Holstein dairy cows of various ages in Fayette County. (Barnett).

HORN FLY (Haematobia irritans) - OKLAHOMA - Averaged 200 per head on cows and ranged up to 1,000 per head on bulls in Payne County. (Okla. Coop. Sur.).

MOSQUITOES - INDIANA - Fourth instars of Aedes grossbecki taken in Spencer County; A. canadensis and A. stimulans collected from single pool in Sullivan County. Fourth instar Culiseta inornata collected in Dubois County. (Meyer). ARKANSAS - Culex pipiens quinquefasciatus (southern house mosquito) increasing and becoming locally abundant in Phillips County. Eggs very heavy. (Meisch, Dayhoff). UTAH - Aedes dorsalis larvae found in Salt Lake County. (Graham). A. dorsalis larvae common in Weber County salt-grass areas; A. increpitus larvae up to 200 per dip in pools along river; no adults yet of either species. Few overwintering Culex tarsalis adults emerging from hibernation (Fronk, Apr. 1); adults occasionally found in homes at Logan, Cache County, (Knowlton).

FACE FLY (Musca autumnalis) - IDAHO - Annoying in home at Elk River, Clearwater County, April 5. (Portman). NEW HAMPSHIRE - Several thousand adults resting on exterior walls of barn April 1-5 at Lee, Strafford County. (Blickle).

AMERICAN DOG TICK (Dermacentor variabilis) - MARYLAND - First adults of season recovered from dog at Greenbelt, Prince Georges County. (U. Md., Ent. Dept.).

HOUSEHOLDS AND STRUCTURES

BROWN SPIDER BEETLE (Ptinus clavipes) - IOWA - Found in home in Buena Vista County; sent in for identification March 19. This is a new county record. (Iowa Ins. Sur.).

A DRYWOOD TERMITE (Marginitermes hubbardi) - ARIZONA - Infestation in floor of home at Yuma, Yuma County. Home fumigated. Determined by B. Nutting. (Ariz. Coop. Sur.).

BENEFICIAL INSECTS

A BRACONID (Lysiphlebus testaceipes) - OKLAHOMA - Parasitism by this species very heavy in greenbug infested wheat throughout southwest area; giving good control in many fields. Parasitism ranged 20-30 percent in 3 wheatfields in southeast Major County and one field in Cleveland County. Light parasitism in most wheat in Payne and Garfield Counties, and in heavily infested Dewey County field. (Okla. Coop. Sur.).

HONEY BEE (Apis mellifera) - WYOMING - In 3 alfalfa fields near Veteran, Goshen County. (Bitner). UTAH - Survival good in Cache and Weber Counties; only 2-3 percent winter loss. In some inbred lines, loss was 10-12 percent for experimental bees. Honey surplus extremely low. (Nye).

CONVERGENT LADY BEETLE (Hippodamia convergens) - OKLAHOMA - Larvae ranged 4-20 per linear foot of wheat in southeast Major County. Ranged 0-5 per linear foot in most wheat in Payne, Garfield, Dewey, Cleveland, and Oklahoma Counties. Ranged 0-4 per square foot of alfalfa in Blaine, Cleveland, and Oklahoma Counties. (Okla. Coop. Sur.).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

A GRASSHOPPER (Oedaleonotus enigma) - IDAHO - First instar nymphs light south of Glens Ferry, Elmore County, April 1. (Evans).

WHITEFRINGED BEETLES (Graphognathus spp.) - ALABAMA - Larvae destroyed 5-acre stand of field corn in Houston County. Larvae destroyed first and second plantings of tomatoes in home garden in same county. (Stephenson, Wilson).

DETECTION

New State Records - GREENBUG (Schizaphis graminum) OREGON - Umatilla County (p. 259). A MIDGE (Pinyonia edulicola) WYOMING - Albany County (p. 263).

New County Records - ALFALFA WEEVIL (Hypera postica) OKLAHOMA - Cleveland, Oklahoma, Blaine (p. 260). BROWN SPIDER BEETLE (Ptinus clavipes) IOWA - Buena Vista (p. 264).

CORRECTIONS

CEIR 21(14):213 WOOLLY WHITEFLY (Aleurothrixus floccosus) - CALIFORNIA - Delete note. Specimen misidentified. (Cal. Coop. Rpt.).

CEIR 21(15):235 AN ARMORED SCALE (Clavaspis subsimilis) - FLORIDA - Delete note. Collection misidentified. (Fla. Coop. Sur.). This deletion should be made under DETECTION on pages 229 and 236 also. (PPD).

HAWAII INSECT REPORT

Turf and Pasture - GRASS WEBWORM (Herpetogramma licarsialis) larvae generally trace, as many as 3 (average less than 0.5) per square foot, in spots in 100+ acres of Kikuyu grass (Pennisetum clandestinum) and Pangola grass (Digitaria decumbens) at Hana, Maui. Larval activity near nil in pastures at other areas in Hana and Waihee. On Oahu, larvae and adults generally trace in windward areas; adults light, average 15 per 10 sweeps, in mixed stand of border grass at Mililani Memorial Park. (Ah Sam et al.).

General Vegetables - BEET ARMYWORM (Spodoptera exigua) larvae moderate in 0.25 acre of bulb onion at Waipouli, Kauai; many leaves with 3-4. Generally trace to light in green onion fields at Waianae, Oahu; larvae range from 1 per 20 plants in 0.1-acre field to 1 per plant in 0.25-acre planting. (Sugawa, Kawamura). All stages of SWEETPOTATO WEEVIL (Cylas formicarius elegantulus) light to moderate in 4 acres of sweetpotato at Hoolehua, Molokai. (Fujimoto).

Ornamentals - COCONUT SCALE (Aspidiotus destructor) infested about 20 percent of 100+ Chinese privet (Ligustrum sinense) hedge plants at Honolulu, Oahu; 5 percent of leaves on infested plants moderately affected. This is a new host record. Larvae and adults of a LADY BEETLE (Telsimia nitida) and adults of APHELINID WASPS (Aphytis spp.) light on infested foliage. (Namiki, Kashiwai). HAWAIIAN THRIPS (Taeniothrips hawaiiensis) moderate to heavy (up to 300 nymphs and adults per blossom) on gardenia (Gardenia jasminoides) at Kaneohe, Oahu; nymphs and adults moderate (100+ per blossom) on 20 of same host at Mililani Memorial Park. (Funasaki, Kawamura).

General Pests - CORN EARWORM (Heliothis zea) larvae heavy in small planting of lettuce (about 80 percent of leaves damaged) and in 0.1-acre planting of carnation (buds severely damaged) at Waipouli, Kauai. Moderate in buds of small backyard planting of roses at Wailua, Kauai. Larvae trace (about 1 per 25 ears) in 5 acres of mature corn at Waianae, Oahu. (Sugawa, Kawamura). Moderate numbers of VAGRANT GRASSHOPPER (Schistocerca vaga) and PINKWINGED GRASSHOPPER (Atractomorpha sinensis) feeding on leaves of sweetpotato in small backyard planting at Ewa, Oahu. Adults of S. vaga moderate in weed growth adjacent to small backyard farms in same area. (Au). Larvae and adults of THREELINED POTATO BEETLE (Lema trilineata) heavy in small backyard planting of eggplant at Kuau, Maui; heavy on wild solanaceous plants in Pulehu. Larvae and adults heavy on Jimson weed (Datura stramonium) in marginal land adjacent to large acreage of corn at Waianae, Oahu. (Miyahira, Kawamura).

Beneficial Insects - About 75-95 percent of Ceroplastes cirripediformis (barnacle scale) nymphs in moderate infestation on 40 acres of passionfruit at Kahului, Maui, parasitized by various wasps, primarily an ENCARTID WASP (Coccidoxenus mexicanus). (Ah Sam, Miyahira).

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville, 4/2-9, BL - Armyworm (Pseudaletia unipuncta) 1, beet. armyworm (Spodoptera exigua) 1, black cutworm (Agrotis ipsilon) 1, granulate cutworm (Feltia subterranea) 4, variegated cutworm (Peridroma saucia) 2, yellowstriped armyworm (Spodoptera ornithogalli) 1. MISSISSIPPI - Stoneville, 3/2-8, 2BL, 34-70°F., precip. 0.19 - Armyworm 98, black cutworm 32, variegated cutworm 21. MISSOURI - Platte County, 3/31-4/7, BL - Black cutworm 7. TEXAS - Waco, 3/2-8, BL - Armyworm 35, beet armyworm 4, black cutworm 8, corn earworm (Heliothis zea) 1, granulate cutworm 24, saltmarsh caterpillar (Estigmene acrea) 2, variegated cutworm 32, yellowstriped armyworm 2.

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1970
(Continued from page 256)

ORNAMENTALS

Highlights:

BAGWORM damage was heavy on shrubs in most areas. MIMOSA WEBWORM was heavy on mimosa and honeylocust in New Jersey. CABBAGE LOOPER, SOYBEAN LOOPER, and BEET ARMYWORM were troublesome on field-grown flowers in Florida. ARMORED SCALES were a problem on ornamentals in several States.

BAGWORM (Thyridopteryx ephemeraeformis) hatching began the first week of May in Payne County, OKLAHOMA. Counts were moderate to heavy in most areas on evergreens during June, July, and August; and were the heaviest in 35 years in Mayes County in mid-July. By September 8, of the bags checked, 8 percent still contained larvae, the remainder had pupated or died, and 10 percent had been destroyed by parasites. Damage on junipers by this pest was generally more severe than usual in eastern KANSAS and much treating was done. In NEBRASKA, first instars were active at Lincoln, Lancaster County, May 29. Populations were generally heavier than in 1969. Damage to junipers was heavy in several eastern cities. Bagworm caused heavy defoliation in scattered areas of MISSOURI. Most damage was confined to ornamentals; however, defoliation was noted on natural-growing eastern redcedar on the Pomme de Terre Reservoir. Damage is expected to continue in 1971. Bagworm continues to be the most common pest of ornamental evergreens in Missouri. In OHIO, phone calls and reports indicated bagworm was heavy. The most commonly attacked plants were juniper and arborvitae, and usually damage was most serious to isolated unsprayed shrubs around homes. Small larvae were found in early June feeding on oaks in central Ohio, and other reports of early damage to various shade and evergreen trees were received. The first indications of pupation occurred in early August, but reports of larval feeding continued into September. Parasitic wasps were observed near some bagworm populations during the pupal stage. Larvae were heavy the last of May in middle TENNESSEE and were common elsewhere. Heavy damage was noted in all areas to native "cedars" and to arborvitae around homes and office buildings. Controls were not applied in most cases until larvae were too large and pesticides were not effective. This pest was reported on arborvitae and rose throughout SOUTH CAROLINA, including Cherokee and Horry Counties. Bagworm was the most destructive pest to coniferous shrubs throughout ALABAMA.

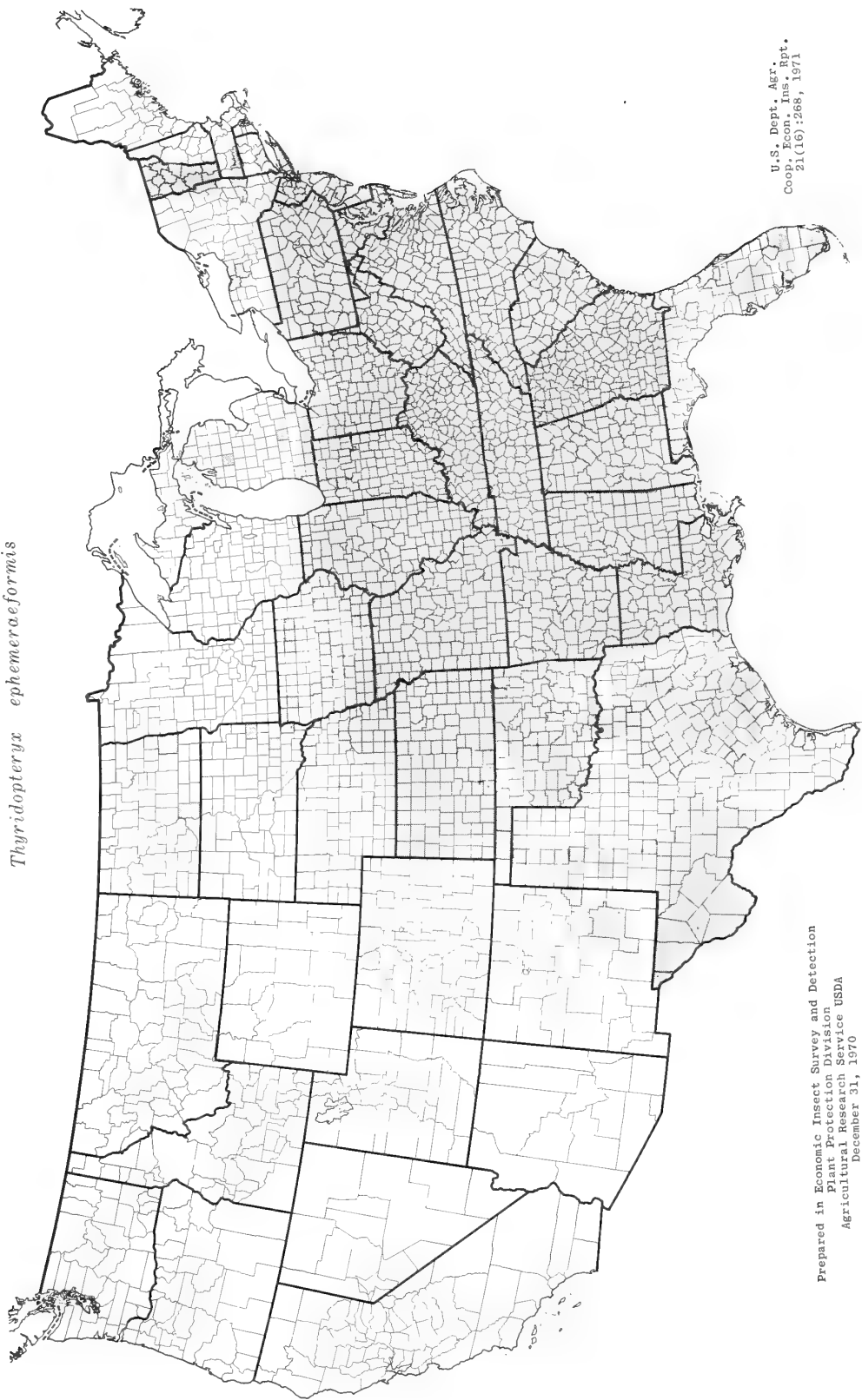
Larvae of several NOCTUID MOTHS were troublesome on field-grown flowers in Manatee County, FLORIDA. CABBAGE LOOPER (Trichoplusia ni) was abundant on the spring and fall crops of chrysanthemum and Gypsophila and damage was severe to the spring crop of snapdragon and gladiolus. Moths appeared to migrate from the south. Larval mortality was heavy due to a disease during late spring. SOYBEAN LOOPER (Pseudoplusia includens) was the second most common noctuid on gladiolus, chrysanthemum, and snapdragon. This species was also easier to control than cabbage looper. During the spring and summer BEET ARMYWORM (Spodoptera exigua) was heavy on chrysanthemum and gladiolus; lighter on petunia, geraniums, carnations, and statice. This pest was scarce during the fall on these crops. Chemical control was about 80 percent effective on this species.

IRIS BORER (Macronoctua onusta) was reported from CALIFORNIA for a new State record on July 1. Larvae were recovered from iris rhizomes at Sacramento, Sacramento County. Eradication treatments were applied.

A TORTRICID MOTH (Choristoneura houstonana) was active on ornamental junipers in late May in KANSAS, but no later reports were received. C. zapulata heavily damaged various ornamentals including cotoneaster, pyracantha, and rose in southern Washoe County, NEVADA, in late May and early June.

Distribution of Bagworm

Thyridopteryx ephemeraeformis



U.S. Dept. Agr.
Coop. Econ. Ins. Rpt.
21(16):268, 1971

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Agricultural Research Service USDA
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EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana) infestations were light with a few Scotch pines showing damaged terminals. Pupation was noted in Union County, OHIO, by June 8. Damage by R. frustrana bushnelli (an olethreutid moth) in NEBRASKA generally increased. Larvae damaged 25-70 percent of the laterals in a commercial planting of Austrian and Scotch pine in Madison County.

JUNIPER WEBWORM (Dichomeris marginella) was found on juniper nursery stock at Alameda County, CALIFORNIA. This was an eradication pest and all infested trees were destroyed. A PLUME MOTH (Platyptilia pica crataea) was a severe pest on geraniums in most areas of California.

PALM LEAF SKELETONIZER (Homaledra sabalella) was numerous on palm in Charleston and Beaufort Counties, SOUTH CAROLINA. AZALEA CATERPILLAR (Datana major) was not reported on azaleas in South Carolina.

ZIMMERMAN PINE MOTH (Dioryctria zimmermani) was very prevalent in ornamental pines grown in the Portland area of Multnomah County, OREGON. Larval development was accelerated due to mild winter weather and late instars were noted in late March. MIMOSA WEBWORM (Homadaula anisocentra) populations in NEW JERSEY were heavier than in 1969. Infestations were heavy on mimosa and honeylocust in Mercer, Union, Middlesex, Somerset, and other southern counties during July, August, and September. A PHYCITID MOTH (Undulambia polystichalis) was the major pest in leatherleaf ferneries in FLORIDA. Economic damage occurred in many commercial ferneries, and growers have had increasing difficulty in controlling this pest with the recommended chemical.

WHITE PINE WEEVIL (Pissodes strobi) damage increased throughout NEW JERSEY especially in home plantings in Middlesex, Somerset, and Monmouth Counties. A JAPANESE WEEVIL (Pseudocneorhinus bifasciatus) was found in Barnwell and Richland Counties, SOUTH CAROLINA, for new county records. This species has been reported from Chesterfield and Florence Counties. BLACK VINE WEEVIL (Brachyrhinus sulcatus) was light in OHIO and only a few nurseries reported infestations. Adults were first noticed in early June and reports of oviposition in early August. Most reports came from the southeastern areas. B. rugosostriatus larval counts of up to 10 per plant were reported on roots of yew in several Multnomah County, OREGON, nurseries in March. STRAWBERRY ROOT WEEVIL (B. ovatus) damaged arborvitae in several field nurseries in same area. Adult girdling damage was reported in the Portland area in February, and larvae up to 15 per tree were reported from a Gresham nursery in March. Weevils, primarily species of the genera Sciopithes and Brachyrhinus, increased again in residential ornamental plantings in the Portland area indicating an upward trend over the past two years. HOLLYHOCK WEEVIL (Apion longirostre) was less numerous and less injurious than during the first 2 seasons after it was recorded in UTAH.

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata undecimpunctata) adults caused severe damage to a zinnia field at Central Point, Jackson County, OREGON, in early July. BLACK BLISTER BEETLE (Epicauta pennsylvanica) damaged 50 percent of the leaves on honeysuckle in Burleigh County, NORTH DAKOTA.

WHITE GRUBS (Phyllophaga spp.) began to emerge the last of April and by the first of June extensive defoliation of trees and shrubs was reported in WISCONSIN. Adults peaked about mid-June and populations decreased rapidly. Indications from blacklight trap collections was the flight during 1970 was about 5 times that of 1967. ROSE CHAFER (Macrodactylus subspinosus) adults were troublesome during June and July in Morris and Essex Counties, NEW JERSEY. Populations were very much heavier than during 1969. Damage was primarily in home ground plantings, especially roses and grape.

OYSTERSHELL SCALE (Lepidosaphes ulmi) was serious on lilacs in UTAH. Oystershell scale and PINE NEEDLE SCALE (Phenacaspis pinifoliae) were heavy on lilac, green ash, cotoneaster, willow, poplar, spruce, and pine trees in WYOMING. Oystershell scale eggs hatched May 18 at Lincoln, Lancaster County, NEBRASKA. Damage to lilac canes was severe in parts of the eastern area. Eggs of this scale were hatching

in Dane County, WISCONSIN, on May 22. Populations were heavy in scattered areas. WHITE PEACH SCALE (Pseudaulacaspis pentagona) remained a serious pest of ornamentals in FLORIDA. Phenacaspis cockerelli continues to be a serious pest of a wide variety of ornamentals. Pseudaonidia clavigera continued to be a problem on camellias in west-central areas. TEA SCALE (Fiorinia theae) is still a major problem on camellias and Chinese holly in Florida. Tea scale was the most destructive and widespread scale on camellia and Burford hollies, and was found throughout the year in ALABAMA. CAMELLIA SCALE (Lepidosaphes camelliae) was very heavy on camellias in Edgefield County, SOUTH CAROLINA. EUONYMUS SCALE (Unaspis euonymi) continued to kill or weaken euonymus, primarily Euonymus japonica varieties at Albuquerque, Bernalillo County, NEW MEXICO, and was difficult to control. JUNIPER SCALE (Carulaspis juniperi) discolored many Pfitzer and other juniper shrubs in northern UTAH. Damage was generally less severe in 1970 than in 1968.

BROWN SOFT SCALE (Coccus hesperidum) infestations were heavy on many house plants in DELAWARE. FLETCHER SCALE (Lecanium fletcheri) egg laying was completed in WISCONSIN on arborvitae and taxus on June 10 and hatch was completed by June 24. Infestations were lighter than in recent years on nursery stock. HEMISPHERICAL SCALE (Saissetia coffeae) was an important pest of greenhouse plants, palms, and cycads in FLORIDA. In SOUTH CAROLINA, Ceroplastes ceriferus seems to be spreading statewide on Burford holly and other plants.

GREEN PEACH APHID (Myzus persicae) counts were 25 per tip on Jerusalem-cherry in Cass County, NORTH DAKOTA. Counts were 10-12 per tip on chrysanthemum in a Burleigh County greenhouse. Large populations of this aphid developed in Manatee County, FLORIDA, from early spring migrants. Damage was severe to chrysanthemum, snapdragon, statice, petunia, and lily. Fall populations on chrysanthemums were light. Green peach aphid was troublesome in several additional areas. SPIREA APHID (Aphis spiraeicola) infestations on spirea were spotted and less general than usual in UTAH. IVY APHID (Aphis hederiae) counts were mostly light on English ivy in Payne County, OKLAHOMA, except during late October and early November when 700-800 per terminal were common. Eggs of several species of APHIDS hatched 10 days later than during 1969 in WISCONSIN: Capitophorus spp. on Russian olive and APPLE GRAIN APHID (Rhopalosiphum fitchii) on Prunus spp. on April 17 compared to April 7, 1969. Counts remained light throughout the season. AN APHID (Eulachnus agilis) built up in early May and peaked in late May in OHIO. The second peak occurred in August. Christmas trees that were not treated prior to each buildup were damaged the most.

COOLEY SPRUCE GALL APHID (Adelges cooleyi) was a problem in many OHIO nurseries. Oviposition occurred in mid-May and galls were well formed by early July. Adults emerged in central areas about July 14 and about one week later in the northern areas. This aphid was recorded for the first time in Montgomery County.

ROSE LEAFHOPPER (Edwardsiana rosae) was abundant and discolored rose foliage throughout UTAH. VIRGINIACREEPER LEAFHOPPER (Erythroneura ziczac) and other species caused leaves to turn brown during August. Damage was less common than a few years ago in Utah.

TWOSPOTTED SPIDER MITE (Tetranychus urticae) was heavy on roses at Clemson, Oconee County, and in the upper Piedmont areas of SOUTH CAROLINA. This spider mite was found throughout FLORIDA and caused severe damage under certain conditions in Dade, Manatee, Hillsborough, Orange, Miami, and Volusia Counties on numerous ornamentals. SPURGE SPIDER MITE (Oligonychus ununguis) was the most frequently reported pest of evergreen trees and shrubs in INDIANA. An ERIOPHYID MITE (Cecidophyopsis psilaspis) was found during January and February infesting and deforming most buds of Texas at Olympia, Thurston County, and at Puyallup, Pierce County, WASHINGTON.

CITRUS WHITEFLY (Dialeurodes citri) in CALIFORNIA was prevalent on gardenias and privet at Sacramento, Sacramento County; San Diego, San Diego County; and Santa Ana, Orange County. A WHITEFLY (Aleyrodes spiraeoides) was very abundant on cultivated iris in Yakima County, WASHINGTON. GREENHOUSE WHITEFLY (Trialeurodes

vaporariorum) was a continuous problem throughout the season in vegetable and floral greenhouses in OHIO.

MONTEREY PINE RESIN MIDGE (Cecidomyia resinicoloides) generally infested ornamental pines, especially Pinus contorta, throughout Portland area, Multnomah County, OREGON. Populations appeared to be heavier than usual. Many trees surveyed had 90 percent of the 1969 terminals infested. Adult emergence began in mid-May. BOXWOOD LEAFMINER (Monarthropalpus buxi) was reported in all Piedmont counties west of Laurens, Laurens County, SOUTH CAROLINA.

WESTERN FLOWER THRIPS (Frankliniella occidentalis) caused heavy damage to ornamentals early in the season in CALIFORNIA. This thrips was common in UTAH gardens. F. bispinosa damaged flowers at Bradenton, Manatee County, FLORIDA, during spring. It appeared to migrate from citrus and early blooming clovers. GLADIOLUS THRIPS (Taeniothrips simplex) damaged gladiolus blooms in CALIFORNIA gardens, where it was more noticeable than in past years. This thrips required controls in UTAH. CUBAN LAUREL THRIPS (Gynaikothrips ficorum) damaged ornamental figs in CALIFORNIA.

EUROPEAN EARWIG (Forficula auricularia) was very widespread and damaging to ornamentals in CALIFORNIA. BROWN GARDEN SNAIL (Helix aspersa) was one of the worst garden pests in California.

FOREST INSECTS 1/

Situation in the Western States

During 1970, forest insects killed several billion board feet of timber in the Western States. Virulent outbreaks of SPRUCE BEETLE (Dendroctonus rufipennis), MOUNTAIN PINE BEETLE (D. ponderosae), DOUGLAS FIR BEETLE (D. pseudotsugae), and FIR ENGRAVER (Scolytus ventralis) ravaged mature, overmature, and weakened timber stands in the West. DEFOLIATORS were not as destructive as in previous years but did cause heavy mortality and growth loss in some areas.

In ALASKA, epidemic SPRUCE BEETLE populations increased for the fourth consecutive year. This pest caused catastrophic timber losses in 1970, particularly in areas where man's activities have weakened mature and overmature white spruce stands. Other factors such as severe windstorms, drought, and fire have also contributed to the population increase. More than one billion board feet of timber have been killed on the Kenai National Moose Range and adjacent State and private lands.

The forests in OREGON and WASHINGTON suffered heavy losses from insects in 1970. BARK BEETLES continued to dominate the forest insect situation and were responsible for killing an estimated 1.2 billion board feet of timber throughout the Pacific Northwest. Decreases in tree mortality caused by DOUGLAS FIR BEETLE in 1970 were offset by increased tree killing by MOUNTAIN PINE BEETLE, SILVER FIR BEETLES (Pseudohylesinus spp.), and slight increases in tree killing by FIR ENGRAVER and SPRUCE BEETLE. New infestations of WESTERN SPRUCE BUDWORM (Choristoneura occidentalis) and WESTERN BLACKHEADED BUDWORM (Acleris gloverana) were found after several years of light activity. Another defoliator, LARCH CASEBEARER (Coleophora laricella) continued to spread in eastern WASHINGTON and was found in northeastern OREGON for the first time. This insect, introduced into the Eastern United States in the 1800's, first appeared in the region near Spokane, Washington, in 1960 and since has continued to spread.

BARK BEETLES continued to dominate the forest insect situation in the Intermountain States. MOUNTAIN PINE BEETLE activity decreased slightly in the region but epidemic

1/ The following summary is the highlights section of the "Forest Insect Conditions in the United States - 1970" which was compiled and published by the Forest Service, U.S. Department of Agriculture. Copies of the complete annual summary are available upon request from the Regional Forester or Area Director in your area. Addresses of the regional offices may be found on page 275 in this issue of the CEIR.

populations persisted in southern IDAHO and western WYOMING. The continuation of a large-scale suppression project will be necessary on the Targhee National Forest to keep timber losses at a tolerable level. Less severe outbreaks occurred in UTAH and other parts of Wyoming and Idaho. Logging of high susceptible timber stands and chemical control were utilized in several areas. The DOUGLAS FIR BEETLE epidemic in southern IDAHO increased further in 1970. Infestations were so widespread in this area that salvage of dead and dying timber was the only measure recommended to reduce losses. Infestations of DEFOLIATORS and other forest insects were less troublesome in 1970 than in 1969. WESTERN SPRUCE BUDWORM and DOUGLAS FIR TUSSOCK MOTH (Hemerocampa pseudotsugata) were the major defoliators in 1970.

Several forest insects continued to deplete the forest resources of the central Rockies in 1970. BARK BEETLES were again the most important pests and caused severe timber losses in spruce, lodgepole pine, ponderosa pine, and Douglas-fir stands in the region. MOUNTAIN PINE BEETLE populations persisted on more than one-quarter million acres of stagnated ponderosa pine stands in SOUTH DAKOTA and COLORADO. For the second consecutive year SPRUCE BEETLE infestations increased in areas containing windthrown timber and logging slash. After 38 million board feet of standing timber were killed in 1970 and if the outbreak continues, several hundred million board feet of mature spruce may be killed in WYOMING and COLORADO. WESTERN SPRUCE BUDWORM regained outbreak status on the San Isabel National Forest in COLORADO after collapsing to a low level in 1969.

Forest insect damage in CALIFORNIA was at a tolerable level in 1970 but expanding populations of several major forest insects were detected. DOUGLAS FIR BEETLE, which has remained relatively inactive since 1966, showed signs of increased activity on the Plumas and Six Rivers National Forests in northern California. Approximately 2 million board feet of timber were killed on these forests. WESTERN PINE BEETLE (Dendroctonus brevicomis) and MOUNTAIN PINE BEETLE continued to infest weakened ponderosa pine stands in San Bernardino County. The discovery of a GYPSY MOTH (Porthetria dispar) egg mass on wooden crates from New Jersey initiated an intensive detection program in San Juan Capistrano. Inspection for additional egg masses and other surveillance procedures will continue. Populations of another important defoliator, DOUGLAS FIR TUSSOCK MOTH, began to increase after several years of inactivity. The largest infestation in 1970 covered several thousand acres on the Eldorado National Forest. For the second consecutive year the population of LODGEPOLE NEEDLEMINER (Coleotechnites milleri) increased in Yosemite National Park.

The forests of the northern Rocky Mountains were attacked by a variety of insects in 1970. Several species of DEFOLIATORS, particularly WESTERN SPRUCE BUDWORM, LARCH CASEBEARER, and DOUGLAS FIR TUSSOCK MOTH were active in the region. Western spruce budworm defoliated about 4 million acres of forests, but populations continued to decrease in the Douglas-fir stands east of the Continental Divide and increase west of the Divide in MONTANA and IDAHO. Larch casebearer expanded its range in western Montana but caused only light defoliation in most areas. MOUNTAIN PINE BEETLE populations increased in the northern Rockies while SPRUCE BEETLE, DOUGLAS FIR BEETLE, and FIR ENGRAVER declined in most areas.

In the Southwestern States, epidemic SPRUCE BEETLE populations continued to deplete the virgin spruce forests of the Mt. Baldy Wilderness Area and Fort Apache Indian Reservation in ARIZONA. More than 27 million board feet of spruce have been killed on the reservation by this pest during the past two years. Epidemic populations of ROUNDHEADED PINE BEETLE (Dendroctonus adjunctus) infested 250,000 ponderosa pine trees on the Lincoln National Forest and Mescalero Apache Indian Reservation in NEW MEXICO, in 1970. DEFOLIATOR populations were at low levels throughout most of the region. Suppression of defoliators was required in several recreation areas.

Situation in the Lake and Central States and the Northeast

DEFOLIATORS remained the most troublesome forest pests in the Eastern Region. Twenty-five species of defoliators were active in this region during 1970. Major defoliators included GYPSY MOTH (Porthetria dispar), FOREST TENT CATERPILLAR (Malacosoma disstria), LARGE ASPEN TORTRIX (Choristoneura conflictana), a RED-HUMPED OAKWORM (Symmerista canicosta), and a complex of LEAFROLLERS and LEAFTIERS. More than 7 million acres of forest suffered defoliation from these pests in 1970 and most of the serious outbreaks are expected to continue in 1971.

SOUTHERN PINE BEETLE (Dendroctonus frontalis), normally more of a problem in the South and Southeast, has caused serious timber damage in MARYLAND and DELAWARE. This outbreak extends into VIRGINIA and is expected to continue in 1971. BALSAM WOOLLY APHID (Adelges piceae) infestations increased in MAINE but declined in NEW HAMPSHIRE. BEECH SCALE (Cryptococcus fagisuga) and its associate fungus continued to cause widespread destruction of commercial-sized beech trees in New England.

Situation in Southern and Southeastern States

A variety of forest insects were active in the Southern Region during 1970. BARK BEETLES as usual were the most important pests with infestations occurring in most Southern States. Epidemic SOUTHERN PINE BEETLE populations in the southern Appalachian Mountains were greatly reduced by extremely low temperatures during January 1970. Populations remained at a low level in most of this area except on the Tusquitee District of the Nantahala National Forest, NORTH CAROLINA, and the Tellico District of the Cherokee National Forest, TENNESSEE.

Populations of ENGRAVER BEETLES (Ips spp.) continued to cause heavy tree mortality in the Hurrican Camille area of MISSISSIPPI and caused some mortality in areas of LOUISIANA, TEXAS, SOUTH CAROLINA, and TENNESSEE. BLACK TURPENTINE BEETLE (Dendroctonus terebrans) was also active in the Hurricane Camille area and caused heavy timber losses in the sandhills of SOUTH CAROLINA.

DEFOLIATORS were more active in the Southeastern Area during 1970. Infestations of VARIABLE OAKLEAF CATERPILLAR (Heterocampa manteo), FOREST TENT CATERPILLAR, WALKINGSTICK (Diapheromera femorata) and various SAWFLIES caused moderate to heavy defoliation.

Suppression Activities

Forest insect suppression programs were conducted throughout the United States during 1970. Major campaigns were directed against southern pine beetle, mountain pine beetle, spruce beetle, saddled prominent, and spruce budworm, and small-scale projects were waged against many less troublesome insects. Both public and private agencies continued to cooperate in suppression projects and pilot projects in the search for new and improved methods of forest insect control.

In the Western States bark beetles were again the major target of control. Forest land managers continued to deemphasize direct chemical control and rely more on alternative methods such as salvage, trap tree, and burning infested trees; however, more than 400,000 trees were treated for bark beetles during 1970.

The spruce beetle outbreak in Alaska is so large that salvage appears to be the only practical means of preventing timber losses. Even this method is not completely satisfactory since an outlet for such a vast quantity of timber is not available.

The most vigorous suppression project in the West was directed against the mountain pine beetle on the Targhee National Forest. Mountain pine beetle infestations were also reduced in Oregon and Washington by an aggressive precommercial thinning program.

In California, a synthetic sex attractant was tested for control of the western

pine beetle, and in the Southwestern States cacodylic acid treated trees were evaluated as lethal traps for the spruce beetle. Further studies on both of these projects are planned for 1971.

In the Southern Region, nearly one-half million southern pine beetle infested trees were salvaged or burned to suppress this pest. Only 56 pounds of benzene hexachloride were used against the southern pine beetle in 1970.

Other significant suppression activities in this region included a cooperative spray project in Virginia to control the fall cankerworm and a release of cocoon parasites to control the Virginia pine sawfly by the Virginia Division of Forestry and the Southeastern Forest Experiment Station.

The largest defoliator suppression effort in the United States was directed against the spruce budworm in Maine. In this cooperative project 211,625 acres were aerially sprayed with Accothion. 1/ Satisfactory control was achieved but the budworm population is expected to be high in this area again in 1971.

Other forest insects requiring suppression in the Eastern Region were gypsy moth and saddled prominent, saratoga spittlebug, orangestriped oakworm, Nantucket pine tip moth, pine bark aphid, and white pine weevil.

Pest Control Accomplishments in the United States, FY 1970

<u>Insect</u>	<u>Locations</u>	<u>Trees Treated</u>	<u>Acres Sprayed</u>
Southern pine beetle	South and Southeast	474,531	
Mountain pine beetle	Idaho, Utah, Montana, Colorado, South Dakota, Wyoming	277,485	
Bark beetles <u>1/</u>	California, Oregon, Washington	112,914	
Spruce beetle	Colorado, Wyoming, Montana, New Mexico, Alaska	11,407	
Roundheaded pine beetle	Nevada, Arizona	375	
Saratoga spittlebug	Michigan, Wisconsin		5,425
Saddled prominent	New York		13,704
Fall cankerworm and leafrollers	New Jersey, Virginia		2,220
Spruce budworm	Maine		211,625
Balsam woolly aphid	North Carolina		12
European pine shoot moth	Washington	74	
Miscellaneous	Entire United States		309
Total		876,786	233,295

1/ Trade names used in this article are solely for the purpose of providing specific information. This does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture over other products not mentioned.

REGIONAL AND AREA OFFICE ADDRESSES

U.S. FOREST SERVICE

<u>Region</u>		<u>Region</u>	
1	U.S. Forest Service Federal Building Missoula, Montana 59801	6	U.S. Forest Service P.O. Box 3623 Portland, Oregon 97208
2	U.S. Forest Service Federal Center, Building 85 Denver, Colorado 80225	10	U.S. Forest Service Federal Office Building P.O. Box 1628 Juneau, Alaska 99801
3	U.S. Forest Service Federal Building 517 Gold Avenue, S.W. Albuquerque, New Mexico 87101	<u>Area</u>	
4	U.S. Forest Service Federal Office Building 324 - 25th Street Ogden, Utah 84401	NA	Northeastern Area U.S. Forest Service 6816 Market Street Upper Darby, Pennsylvania 19082
5	U.S. Forest Service 630 Sansome Street San Francisco, California 94111	SA	Southeastern Area U.S. Forest Service Suite 800 1720 Peachtree Road, N.W. Atlanta, Georgia 30309

FOREST AND SHADE TREES

Highlights:

WHITE PINE WEEVIL caused extensive damage to Norway spruce in Rhode Island and was of concern on ornamental and christmas tree plantings in Maine. EUROPEAN PINE SHOOT MOTH infested a single pine in a nursery in Oregon; adjacent trees were destroyed and 15,000 treated. This pest is increasing again in Wisconsin. NANTUCKET PINE TIP MOTH was heavy in Kansas and Missouri. SPRUCE BUDWORM control in Maine was not as good as anticipated. This tortricid continues threatening in 1971. LEPIDOPTEROUS larvae were troublesome on a variety of deciduous trees throughout the Nation. VARIABLE OAKLEAF CATERPILLAR defoliation was heavy in Arkansas. SADDLED PROMINENT was also troublesome in several areas. FOREST TENT CATERPILLAR feeding was heavy in Minnesota and West Virginia. FALL WEBWORM was heavy in West Virginia, Ohio, and Missouri. ELM LEAF BEETLE defoliation of elms was heavy in several States. Brood X of PERIODICAL CICADA was reported from the East.

A small infestation of MOUNTAIN PINE BEETLE (Dendroctonus ponderosae) in NEW MEXICO was suppressed by salvage logging on Carracas Mesa, Carson National Forest, west of Chama. In SOUTH DAKOTA during the fiscal year 1970, treatment was applied to 12,607 trees on 157,220 acres of Black Hills National Forest, including about 2,100 trees in the Harney District, 1,100 trees south and west of Deadwood, and 5,500 trees west of Spearfish Canyon, plus additional trees in the Pactola District. The trend for infestation was static but high tree mortality could be expected to continue in 1971, which paralleled the situation a year earlier. Tree mortality, primarily in second growth and small saw timber, was highest in the vicinity of Terry Park and the Exemption area in Lawrence County. Size of infestation groups varied from 3 to 10 trees for the small groups to about 2,000 trees in some of the large groups. Parasites, predators, and woodpecker feeding did not exert any substantial degree of control.

BLACK TURPENTINE BEETLE (Dendroctonus terebrans) made broods in pine stumps and live trees in timber sale areas on private and Federal lands in Madison County, MISSOURI. Only small numbers were found in Shannon, Iron, and Reynolds Counties. Numbers are expected to increase in 1971. Some infested trees were felled and burned; other trees in the sale areas were harvested. In FLORIDA, the incidence of attacks greatly declined from 1969's incidence.

WESTERN PINE BEETLE (Dendroctonus brevicomis) increased in OREGON, with most damage to old growth ponderosa pine on the Malheur and Ochoco National Forests. ENGRAVER BEETLES (Ips spp.) caused the majority of the tree losses in FLORIDA.

WHITE PINE WEEVIL (Pissodes strobi) was reported infesting white pine in Pickens County, SOUTH CAROLINA. White pine weevil moderately (20-60 percent) infested trees in Hampshire and Mineral Counties, WEST VIRGINIA. Light infestations (0-20 percent) were in Morgan, Berkeley, Pendleton, and Hardy Counties. Damage in RHODE ISLAND was extensive to Norway spruce in Providence County by July 8 and appeared on many leaders of spruce and white pine by July 16 in Washington County. By August 7 many leaders were brown and dead statewide. Heavy damage continued in several areas throughout MAINE. New trees and plantings for ornamentals and Christmas trees were of most concern. In INDIANA, white pine weevil was more common in 1970 than 1969. Larvae in WISCONSIN heavily damaged Scotch pine in Adams County by June 22 with about 30 percent of the tips dying. Pupation was just underway at this site by late June. Numbers were heavy in Eau Claire County.

NORTHERN PINE WEEVIL (Pissodes approximatus) was collected for the first time in MISSOURI in Boone County. Many adults in WISCONSIN were mating and laying eggs on April 29 at a site in Rock County and were almost gone by May 12.

PALES WEEVIL (Hylobius pales) was reported for the first time in MISSOURI on Scotch pine in St. Charles County. Presence and damage were detected in Scotch pine plantations in Montgomery, Perry, and St. Francois Counties. It is expected to build up and increase its range in 1971. No suppression was conducted in 1970. H. pales in INDIANA was more common in 1970 than in 1969. H. pales in WISCONSIN was numerous and mating at a site in Rock County May 12; it flagged pines in the central area last fall. PINE ROOT COLLAR WEEVIL (H. radicis) was prevalent and damaging jack pine and red pine in Polk County, Wisconsin.

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana) infested one pine in a Canby, Clackamas County, OREGON, nursery in June. This pine was destroyed along with all others within a 200-foot radius, and the remaining 15,000 trees were treated. Chemical controls have reduced previously detected infestations at McNary Dam and Hermiston, Umatilla County, and southwestern Portland, Clackamas County, to very low levels. About 6 percent of the treated trees at Hermiston have sustained very light new attack. No larvae were found during fall surveys in southwestern Portland. European pine shoot moth was a new State record in NEBRASKA. In MISSOURI, moderate numbers infested Scotch, Austrian, and red pines in the Kansas City area, Jackson County. This pest has not been recorded outside Jackson County. Numbers in WISCONSIN appeared to be increasing after being near extinction in the State for several years. Pupation was noted on June 17 in Calumet County. In

RHODE ISLAND, larvae were on Scotch pine by May 1 in Kent County and at bases of pine needles in Newport County on September 8.

NANTUCKET PINE TIP MOTH (Rhyacionia frustrana) was common in Scotch, mugho, ponderosa, and Austrian pines in nurseries and landscapes in KANSAS. It was first reported in early June when 50 percent of the shoots of a mugho pine planting were infested in Sedgwick County. By early July the second generation was on pine in this county. By mid-July up to 4 larvae per shoot had infested up to 70 percent of the shoots of Austrian, mugho, and Scotch pines in this county. Much treating was done. Numbers in MISSOURI ranged from none to heavy. Winter survival was very poor. The second and third generations caused the most extensive damage. Total damage was slightly lower in most areas. Damage was heaviest in Carter, Shannon, Dent, Camden, Laclede, Webster, Christian, and Douglas Counties, and lighter in Osage, Franklin, Washington, Jefferson, St. Francois, Ste. Genevieve, and Morgan Counties. Moderate numbers are expected during 1971. No suppression was conducted in 1970. Infestations were recorded from Barton, Dallas, Jasper, Lincoln, St. Charles, Vernon, and Warren Counties for the first time in 1970. In ALABAMA it was mostly a pest of 2 to 8-year-old pines used as highway and lawn shade trees. It did not attack slash and longleaf pines.

SPRUCE BUDWORM (Choristoneura fumiferana) defoliation in OREGON ranged light to moderate on Douglas-firs and true firs on several thousand acres of the Willowa and Whitman National Forest. Defoliation in MINNESOTA ranged moderate to heavy on balsam fir and white spruce over a gross area of 385,000 acres in Koochiching, St. Louis, Cook, and Lake Counties. Defoliation was light on an additional 150,000 acres in these counties. Egg mass counts in August indicated a slightly decreasing population. Adults still persisted in Oneida County, WISCONSIN, July 17; by July 21, the ratio for larvae and eggs was 1:1. Larvae defoliated about 20 percent of the individual balsam firs and spruces in the area. Previously reported in INDIANA in 1922 and 1928, this pest was taken in Lake County in 1970. In northern MAINE endemic populations infested about 400,000 acres, primarily in Aroostook County. Of this, 210,000 acres were sprayed, primarily in the Oxbow region on the southern part of the epidemic area in west-central Aroostook County. This area has been in serious trouble since 1966. The 84.5 percent control obtained was below expectations. Defoliation was irregular and heavy throughout the treated area and medium to heavy outside the treated area, but no pattern could be found. Balsam fir was the principal host with red spruce a close second. The spruce budworm threat continues into 1971, although tree conditions are improved.

JACK PINE BUDWORM (Choristoneura pinus) numbers in WISCONSIN were heavy in the northwestern area with a strong potential for 1971, erratic in the central area, and collapsed in the northeastern area. Pupation began in the central area first, reaching 50 percent by June 19. In MICHIGAN it is becoming more abundant after a decline during the past 3 years. Heavy numbers infested Scotch pine plantings in Muskegon and Oceana Counties.

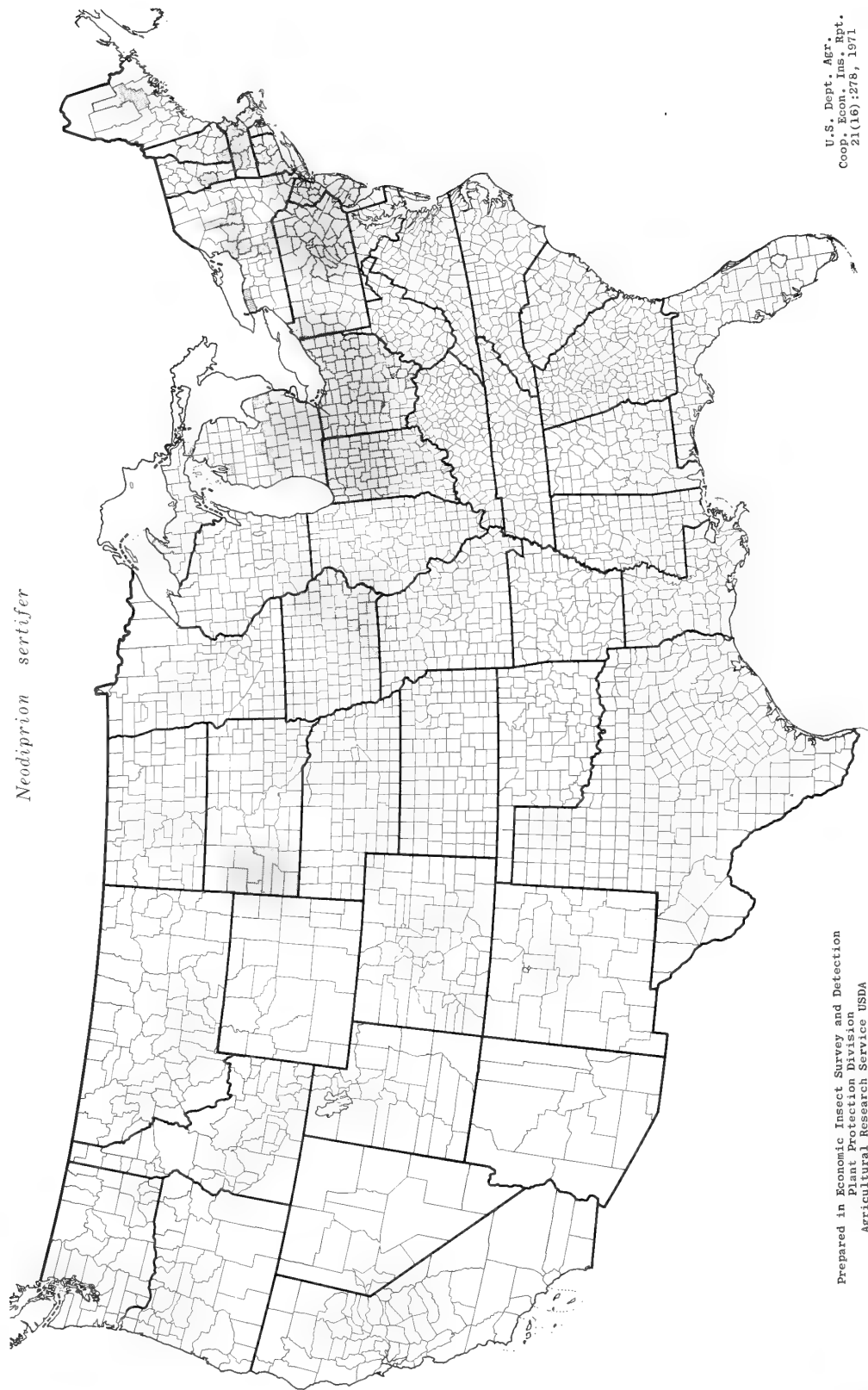
LARGE ASPEN TORTRIX (Choristoneura conflictana) defoliation in MINNESOTA was heavy on aspen on over 1,750,000 acres in St. Louis, Lake, Carlton, and Cook Counties and light on another million acres in the same counties, as well as in Koochiching and Itasca Counties.

A PYRALID MOTH (Dioryctria disclusa) infested 75 percent of the cones on red pine at Washington, Washington County, IOWA. PINE WEBWORM (Tetralopha robustella) damaged many Scotch pine seedlings in the eastern panhandle of WEST VIRGINIA. It was noticeable throughout the State and indications are that it is increasing. Injury is usually confined to seedlings or small trees.

A SATURNIID MOTH (Coloradia pandora lindseyi) defoliation in OREGON ranged light to moderate on ponderosa and lodgepole pines on 5,000 acres of the Deschutes National Forest. Most larvae had pupated by mid-July near China Hat, Deschutes County; pupae ranged 2-7 per square yard. Larvae remaining on trees were heavily parasitized by Apanteles electrae (a braconid). A population increase is expected in 1971.

Distribution of European Pine Sawfly

Neodiprion sertifer



U.S. Dept. Agr.
Coop. Econ. Insects Rpt.
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Agricultural Research Service USDA
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PINE TUSSOCK MOTH (Dasychira plagiata) was most serious in an area comprised of parts of Polk and Burnett Counties in WISCONSIN. Larvae had infested about 2,000 acres of 25 to 30-foot jack pines by June 20; injury ranged light to moderate in 1,800 of these acres and severe in the rest. Pupation started June 25, and eggs hatched August 3. Although egg counts in late July were lighter than expected, a good potential still exists for increased populations.

Larvae of an OLETHREUTID MOTH (Zeiraphera vancouverana) were reared from Sitka spruce in Humboldt County for a new State record in CALIFORNIA. SPRUCE NEEDLE-MINER (Taniva albolineana) damaged ornamental spruce trees in Whitman, Asotin, and Grant Counties, WASHINGTON.

PINE NEEDLEMINER (Exoteleia pinifoliella) is becoming more widespread in MICHIGAN. New infestations were found in Ingham and Genesee Counties. It was initially detected in 1967 in Wayne County and in 1968 in Ottawa County.

Outbreaks of REDHEADED PINE SAWFLY (Neodiprion lecontei) in FLORIDA were small and scattered in Glades, Okeechobee, Marion, and Taylor Counties during the fall. Feeding damage was moderate to severe on slash and longleaf pines. It was reported only once in 1970 in Pickens County, SOUTH CAROLINA. Redheaded pine sawfly defoliated shortleaf pine and some Virginia pine in southeastern MISSOURI during late summer. Larvae partly defoliated 6-50 trees in isolated plantations. Most trees were 4-10 feet tall. Some mortality may occur over a 3 or 4-year period. Populations will be high again in 1971, causing more defoliation. Owners handpicked colonies on small trees and sprayed larger infested trees.

A CONIFER SAWFLY (Neodiprion taedae linearis) in MISSOURI infested scattered open-grown and certain plantation-grown shortleaf pines during spring. Defoliation was at a high peak. Defoliation was 100 percent in plantations in Bollinger and St. Francois Counties. Numbers were heaviest in the south-central and southeastern areas. Owners sprayed and handpicked colonies from small ornamental trees. Populations and damage are expected to be heavy in 1971. A major outbreak of N. taedae linearis and N. pratti pratti occurred in central and western TENNESSEE during May and June. Moderate to very heavy damage was observed, and in some cases, almost complete defoliation occurred. Infestations were over a more general area than in 1969 and damage was heavier. Pine stands were able to put out new growth and offset some of the damage.

Neodiprion pratti pratti damage in NORTH CAROLINA ranged from light to very heavy in Orange, Guilford, Randolph, Yadkin, Buncombe, Warren, Franklin, Vance, Granville, Person, Harnett, and Cumberland Counties. This damage combined with extended drought will probably kill some trees. In WEST VIRGINIA this species in 1966 was first found and identified in the State on Camp Creek, Boone County. Egg and larval surveys expanded the known range into Logan, Lincoln, Wayne, and Kanawha Counties through 1969. In 1970, larval surveys and reported specimens revealed its presence in at least 12 additional counties. No attempt has been made to record exact acreages because most of the areas scouted do not contain concentrated pine stands. Larvae in INDIANA infested 500 acres of shortleaf and Virginia pine in southwestern and south-central areas; defoliation was serious on 200 acres.

Early instars of EUROPEAN PINE SAWFLY (Neodiprion sertifer) in OHIO were reported from Scotch pine and red pine during May. Foliar loss ranged 10-60 percent. In INDIANA, populations increased in much of the State. In MISSOURI, European pine sawfly infested 20 acres of Scotch pine during early spring in Adair County. The owner sprayed the first instars and achieved excellent control. It also infested other Christmas tree plantations and ornamentals in Adair County. Spraying of infested trees was conducted by various tree owners. Another buildup is expected in 1971.

A CONIFER SAWFLY (Neodiprion excitans) severely damaged loblolly pine in Taylor County, FLORIDA, during fall. Some severe defoliation by INTRODUCED PINE SAWFLY (Diprion similis) on mature white pine in MINNESOTA needed chemical control in Isanti, Cass, Morrison, and Crow Wing Counties in early September. Second-generation larvae also caused scattered and light defoliation in Itasca, St. Louis, Koochiching, Carlton, Pine, Aitkin, Mille Lacs, Wadena, Becker, Mahnommen, Hubbard, and Beltrami Counties.

LARCH SAWFLY (Pristiphora erichsonii) defoliation in MINNESOTA averaged 50-70 percent, slightly less in 1970 than in 1969, on most of the 500,000 acres of tamarack in the northern half of the State. It was prevalent throughout PENNSYLVANIA, with 25-75 percent defoliation common in most plantations.

BALSAM WOOLLY APHID (Adelges piceae) damage in OREGON ranged light to moderate throughout the Cascade Mountains from the northern border to just south of Crater Lake National Park. Pacific silver fir and alpine fir were the most severely damaged. COOLEY SPRUCE GALL APHID (A. cooleyi) injured many blue spruce in northern and central localities of UTAH. EASTERN SPRUCE GALL APHID (A. abietis) was light on Norway spruce in OHIO. Galls were fully developed in August and emergence began near the end of the month. By September 8 a few green unopened galls were still present. Oviposition began during early September. In WISCONSIN, gall aphids were less numerous than in recent years. A. cooleyi is generally dominant, but A. abietis was the only one found in nurseries in Door, Racine, Waukesha, and Jefferson Counties. A. abietis hatched April 29 in Rock County compared with May 13 for A. cooleyi. Galls of A. abietis were forming on May 12, and A. cooleyi on May 25. Emergence was only noted September 1 for A. abietis. A. cooleyi hatched in Washington County, RHODE ISLAND, by May 22. By June 5, numbers were known to be heavier than in 1969. Many galls were evident in Providence, Kent, and Washington Counties by September 8. A. abietis galls in this State were noticeable on spruce in Washington County by July 15.

PINE LEAF CHERMID (Pineus pinifoliae), one of the most important conifer insects in WEST VIRGINIA, was abundant throughout the red spruce and white pine range of the State. Numerous galls were on red spruce throughout the Canaan Valley and Cheat Mountain Range. The southern limit of the white pine range is not infested.

PINE NEEDLE SCALE (Phenacaspis pinifoliae) ranged light to moderate in UTAH. Eggs and crawlers in NORTH DAKOTA infested pine and spruce the last week of May. Counts of 1-12 scales per needle infested 50-85 percent of the needles on spruce and pine in Richland, Ward, and Walsh Counties. Hatch in WISCONSIN of the first generation was nearly completed on May 26; hatch of the second generation started July 20. Pine needle scale covered needles of entire trees on June 18 in Washington County, RHODE ISLAND.

PINE SPITTLEBUG (Aphrophora parallella) and SARATOGA SPITTLEBUG (A. saratogensis) were abundant on Virginia and Scotch pines throughout WEST VIRGINIA. Numbers were heavy in Marion, Barbour, and Tucker Counties. Spittlebugs on pines in WISCONSIN were more serious than in previous years. A. saratogensis was heavy in Lincoln, Vilas, and Oneida Counties on red pine; some treatment was warranted in Vilas County. Further treatments were diminished because hot, dry weather reduced the population. A. parallella was most serious in the central area, particularly in Juneau County, and much flagging of Scotch pines was evident from the 1969 infestation. Pine spittlebug adults appeared on June 19, and Saratoga spittlebug adults in the first week of July.

A CONIFER APHID (Cinara tujaefilina) infested arborvitae in many OKLAHOMA areas from January to mid-May. Numbers increased steadily through March (many colonies had 100-150 aphids each) and then declined during April and May. First fall activity in Payne County was found the second week of November.

VARIABLE OAKLEAF CATERPILLAR (Heterocampa manteo), and to a lesser extent, SADDLED PROMINENT (H. guttivitta) infestations on oak were heaviest and most widespread in 10+ years in ARKANSAS. Larval feeding was first observed in Cleburne County in early July. Heavy feeding in this county and other areas of north-central and northeast Arkansas did not occur until September. Heavy defoliation occurred on 2.5 million acres. About 1.5 million acres were moderately defoliated. No control measures were applied. Defoliation did not occur early enough in the season to cause permanent damage. Variable oakleaf caterpillar was a problem on pin oaks in central MISSOURI and a defoliator of white, black, and northern red oaks in Taum Sauk region in Iron and Reynolds Counties. In association with this feeding was PALE TUSsock MOTH (Halisidota tessellaris) and WALKINGSTICK (Diapheromera femorata). Heavy feeding occurred on white and post oaks in Shook area near Poplar Bluff. Some defoliation was attributed to latter two species. Populations are expected to increase in 1971. Individual trees were sprayed. Infestations and defoliation by H. manteo in NORTH DAKOTA occurred in the same area infested by FOREST TENT CATERPILLAR (Malacosoma disstria) during late August. H. manteo defoliation ranged up to 100 percent on 500 acres of trees in Benson County and on 10,000+ acres in the Killdeer Mountains and Badlands area of Dunn County. Infestations were more widespread, but defoliation was not so severe as in 1969.

Variable oakleaf caterpillar and a NOTODONTID MOTH (Symmerista canicosta) defoliation was heavy primarily on oak and basswood on from 25,000 to 50,000 acres in scattered locations in Kandiyohi, Pope, Otter Tail, Itasca, Beltrami, Clearwater, Mahnomen, and Becker Counties, MINNESOTA. Lighter defoliation was widespread in the same counties. Symmerista albifrons was the most abundant and widespread defoliator in MICHIGAN; it defoliated about 275 square miles of predominantly white oak in Muskegon, Oceana, and Lake Counties. Although many defoliation sites were the same as those in 1956-1958, the infestation was more extensive. Many trees were defoliated for the second year, but little mortality is anticipated. Several predators attacked larvae in 3-year-old infestations in Muskegon County. Among them, adults and larvae of Calosoma sycophanta (a carabid beetle) and several pentatomids, the most numerous being Podisus maculiventris (spined soldier bug). Mice and other rodents are believed to play a major role in reducing this insect's numbers by feeding on the overwintering pupae in the litter. Saddled prominent defoliated about 6,000-7,000 acres of maple and beech in Benzie and Manistee Counties. Most infestations are two years old. Adults and larvae of Calosoma sycophanta and a trombidid mite were feeding on larvae. Larvae infested by the mites became quiescent and fed less. The saddled prominent will probably decline, especially in areas defoliated for the third consecutive year.

Saddled prominent defoliation in 1969 occurred in several areas of NEW HAMPSHIRE indicating potential for outbreak in 1970. Light trap collections in Carroll County indicated a heavy population. Peak adult activity occurred between June 3 and 10. Eggs were very numerous by June 25. An ICHNEUMON WASP (Cratichneumon sublatus) was numerous. On June 25, a total of 586 were taken in a blacklight trap. Subsequently an area of at least 100 square miles in Carroll County was defoliated (maple and beech). An aerial survey showed complete stripping in the area. A CARABID BEETLE (Calosoma frigidum) was very abundant in a 100 square mile area; at least one adult per square yard was found in several areas. Adults and larvae were feeding on the larvae of saddled prominent. Saddled prominent in New Hampshire expanded into MAINE in 1970 with about 12,000 acres of beech, sugar maples, birch, and some other hardwoods having been defoliated at Freyburg, Oxford County. Predators increased in New Hampshire and to a lesser extent in Maine. The 1971 outlook for the infested area is not promising.

FOREST TENT CATERPILLAR (Malacosoma disstria) eggs hatched by May 22 at Fort Totten, Benson County, NORTH CAROLINA. Larvae had defoliated 25-90 percent of 1,000 acres of native trees by late June. Defoliation was not so severe as in 1969 due to mortality from effects of weather, parasites, and diseases. Defoliation in northern MINNESOTA spread only 10 miles southwesterly. Heavy defoliation was over an area of 400,000 acres in Koochiching County, adjacent to the Canada border. Light defoliation covered another 1,500,000 acres. This pest has the

potential to become much more serious, as it will defoliate a variety of deciduous trees. In the past few years forest tent caterpillar has become established in the extreme eastern counties of OHIO. Hatch occurred in late April, and by May 6 most larvae were half grown. Damage was heaviest on sugar maple, red oak, and cherry trees. Early spring surveys indicated forest tent caterpillar would not be a problem in Tucker County, WEST VIRGINIA, where it had been noticed in 1969. About 60,000 acres in Tyler, Wetzel, Marshall, and Ohio Counties in the northwestern area would have heavy defoliation. Aerial survey on May 25 failed to accurately describe areas of defoliation due to severe frost damage that occurred May 6. Another aerial survey June 25-27, after frost damage would normally have disappeared, revealed about 150,000 acres to have been seriously damaged. Small infested areas were also noted in Preston, Monongalia, and Nicholas Counties. Egg survey to delimit range of M. disstria for 1971 has not been made, but it is expected to cause moderate to heavy defoliation to hardwoods in northwestern West Virginia.

EASTERN TENT CATERPILLAR (Malacosoma americanum) in MISSOURI was very heavy on black cherry and ornamental Prunus in the St. Louis area during the spring, and was very heavy on cherry in the southeast area, where it defoliated entire trees. Egg masses indicate that infestations will be heavy in 1971. Ornamental owners sprayed trees or handpicked colonies. Heavy numbers were reported on Prunus and wild cherry throughout southern and eastern Missouri. Eastern tent caterpillar populations in INDIANA were normal except for some heavy populations in the southwest district. Egg hatch began in mid-April in southern OHIO on wild cherry. Most were last instars by May 11 and migration began after defoliation of host trees. Pupation occurred in late May and adults were recorded in black-light traps throughout June. The most heavily damaged areas of Ohio were in the south and southeast with most damage on wild cherry. Some defoliation occurred on apple, flowering crab apple, and maple after larval migration. Eastern tent caterpillar has been progressively decreasing in the western area of WEST VIRGINIA where it has been heavy for 3 years. However, it has been increasing in central and eastern areas. Surveys for egg masses will be made and areas of expected heavy infestations will be mapped. Eggs hatched about April 6 in Prince Georges County, MARYLAND. Infestations were heavy in Prince Georges, Montgomery, Howard, Baltimore, and Harford Counties. Wild cherry and flowering crab apple were the most heavily infested hosts. Sixty percent of the wild cherries in these counties were 30-100 percent defoliated. Annoyance to homeowners by migrating larvae peaked in late April. Pupation occurred in late April and early June. Populations of eastern tent caterpillar were quite high throughout NEW JERSEY. First hatching was reported on April 6 in Burlington County. Black cherry and crab apple trees were severely defoliated. Malacosoma incurvum discoloratum larvae in NEVADA heavily defoliated many Fremont cottonwoods in southeastern Clark County in April.

FALL WEBWORM (Hyphantria cunea) was present in outbreak populations in northern WEST VIRGINIA during 1970. Infestations were heavy in this area in 1968 but were occasional during 1969. Numerous nests were observed on individual trees and about 150,000 acres of hardwoods were generally and heavily infested in the northern area. Scattered nests were observed statewide. Defoliation was estimated to be slightly higher than in 1969 in OHIO. First instars were observed in early June on elm and crab apple trees. Within 7 days webs were evident and averaged 8-10 inches. Second and third instars were present in mid-June with infestations still moderately light. Most were full grown by late August and feeding was at a peak. Host plants consisted of wild cherry, elm, crab apple, redbud, dogwood, peach, and plum with 100 percent defoliation of some trees. Fall webworm in MICHIGAN showed little increase over 1969, but was locally abundant in Ingham and Muskegon Counties on birch trees. Infestations were generally light in INDIANA. This pest infested a variety of tree species including persimmon, hickory, walnut, redbud, boxelder, basswood, and sycamore. Populations were heavy in southwest MISSOURI, but infestations were below the level of 1969 in the south-central and southeast. Population levels will be repeated in 1971. Except for control of individual colonies on ornamentals and nut orchards, no widespread control was conducted. Populations were again high in western OREGON. Most

severe damage was to cottonwood and ash trees in the Columbia River Gorge. Fall webworm was heavy on cottonwoods along rivers in northern NEW MEXICO, often 25-50 webs per tree. Numbers were mostly light and spotted in the Mesilla and Pecos Valleys.

Late broods of OAK SKELETONIZER (Bucculatrix ainsliella) became so numerous that cars, houses, and trees were thickly covered in southern NEW HAMPSHIRE, especially those near oak trees. It became necessary for householders to syringe their walks and driveways to obtain temporary relief. Oak skeletonizer first became apparent the week ending July 3. Larval damage was reported from Suffolk, Middlesex, Hampshire, and Essex Counties, MASSACHUSETTS. Within 14 days, state-wide damage was reported. A second brood was well established by September 4 at which time some trees had 50-75 percent defoliation. Infestations remained heavy into October with many complaints reported. Larvae and pupae were recorded as late as October 23. This was the heaviest infestation in several years. This pest caused mild concern to a few homeowners in Lackawanna and Susquehanna Counties, PENNSYLVANIA, in September when leaves on pin oaks showed damage. Oak skeletonizer pupated in La Crosse County, WISCONSIN, on June 26. The second generation pupated on August 28. Populations were generally lighter than in 1969, except in the central areas. Counts in IOWA were very abundant in Allamakee County, part of an outbreak which extended to the State line.

BIRCH SKELETONIZER (Bucculatrix canadensisella) caused extensive defoliation throughout MICHIGAN. The most severe damage occurred in the upper Lower Peninsula, where there are abundant stands of paper birch. Defoliation is expected again in 1971. Although there is little tree mortality, weakened birch are more susceptible to attack by BRONZE BIRCH BORER (Agrilus anxius).

In NORTH DAKOTA, females of SPRING CANKERWORM (Paleacrita vernata) emerged the first week in April. Eggs of FALL CANKERWORM (Alsophila pomataria) hatched the third week in May and adults emerged in mid-October. Adult populations indicate increased infestations for 1971. Fall cankerworm and spring cankerworm populations were insignificant throughout MICHIGAN. The abundance of an ichneumon wasp is believed to have contributed to the decline; heavy parasite populations were present in Midland and Oakland Counties.

LINDEN LOOPER (Erannis tiliaria) during late May caused moderate to heavy defoliation of oaks, basswood, elms, and maples over a 20-square-mile area in the Catoclin Mountains in Frederick County, MARYLAND. The most heavily infested area measures 6 square miles; defoliation ranged 90-100 percent. These infestations collapsed May 22-29 due to a viral epizootic. A GEOMETRID MOTH (Anacamptodes cypressaria) defoliated about 80 percent of the foliage of the cypress trees in Fisheating Creek, Glades County, FLORIDA, late September. Adults were heavy on October 9. Defoliation by this species was severe in September 1968, but practically nonexistent in 1969.

MIMOSA WEBWORM (Homadaula anisocentra) damage ranged moderate to heavy, mostly to mimosa, in scattered areas in the eastern half of OKLAHOMA during August. This pest caused light to severe foliar injury to honeylocust and mimosa in eastern KANSAS, and especially on mimosa in the southeast. It was first reported at Manhattan, Riley County, in mid-June on honeylocust (late larval stage). Mimosa webworm was collected in Poweshiek, Jones, and Des Moines Counties, IOWA, for new records. It is now found in 21 counties. Infestations in INDIANA appeared to be increasing. In OHIO, moderate damage to locust occurred from mid-July throughout August with two generations occurring. First-generation larvae appeared in early June, and second generation began feeding the first week of August. Feeding was consistent but rarely heavy, and more unsightly than damaging. Mimosa webworm was troublesome on honeylocust in the southern half of PENNSYLVANIA. In the southwestern corner, honeylocust was about 100 percent defoliated by August. Mimosa webworm was the major pest of mimosa trees throughout ALABAMA.

FRUITTREE LEAFROLLER (Archips argyrospilus) was heavy and widespread on oak and other trees and shrubs in CALIFORNIA. OAK LEFTIER (Croesia albicomana) surveys were made during March to estimate areas of possible defoliation in WEST VIRGINIA. This survey indicated an area of 53,000 acres had a high potential for defoliation. This same area was checked again following a severe frost and no larval mortality was noted. A combination of frost and oak leaftier defoliated about 100,000 acres of oak from Barton, Pocahontas County, south to Frankford, Greenbier County. Some oak mortality is expected in this area. A complex of species is actually involved but determinations for all species have not been made. Some parasites were noted.

ORANGESTRIPED OAKWORM (Anisota senatoria) damaged pin oak in a State tree nursery in MISSOURI during September. Feeding was heavy on infested trees. Controls were applied. This insect has not made an appearance for at least ten years. Populations are expected to build up in 1971. A SATURNIID MOTH (Hemileuca nevadensis) continued a problem on native cottonwoods in White Sands National Monument, NEW MEXICO.

SATIN MOTH (Stilpnotia salicis) larvae in MAINE defoliated poplar around Millinocket, Penobscot County. Infestations seemed to be moving north with no reduction of populations in infested areas. Parasitism affected a lower percentage of the older larvae. WHITEMARKED TUSOCK MOTH (Hemerocampa leucostigma) was reported more frequently than in past years in INDIANA.

MAPLE TRUMPET SKELETONIZER (Epinotia aceriella) larvae were active throughout MAINE. Maples were the principal hosts but beeches and red oaks were also infested. Infestations were heavier than in 1969 and occurred primarily in the central and south-central areas. This pest was very numerous in southern NEW HAMPSHIRE June 15 to September 30. Practically every leaf on trees examined (sugar maple) was infested. This pest was a concern to property owners for the past several years (1968, 1969). Populations were heaviest in 1970.

CALIFORNIA OAKWORM (Phryganidia californica) was very damaging to oaks but more scattered than in the past five years in CALIFORNIA. LILAC BORER (Podosesia syringae syringae) larvae severely damaged hundreds of blue ash trees, particularly in Salt Lake County, UTAH. This was the most damaging borer of shade trees during the past 2 years. Damage has spread rapidly since 1967. CARPENTERWORM (Prionoxystus robiniae) continues to be the most destructive of the borers of hardwoods in MISSOURI. BIRCH TUBEMAKER (Acrobasis betulella) was reported for the first time from Towanda, Bradford County, PENNSYLVANIA, for a new State record. Specimens were collected from white birch and determined June 5. Infestation was light.

ELM LEAF BEETLE (Pyrrhalta luteola) was abundant in Grant County and noted in King County, WASHINGTON. The first adult feeding in IDAHO was noted May 2 at Parma, Canyon County, the first eggs May 29. First larval feeding in Gooding County, June 2. Elm leaf beetle damage was light in the south-central area and centered at Twin Falls, Twin Falls County. Defoliation was severe in certain southwestern and northern areas. Generally the severity of defoliation was thought to be due to the switch from a persistent to a less persistent insecticide. In WYOMING, this pest defoliated many elms at Wheatland, Platte County. It was extremely heavy and very widespread in CALIFORNIA; hibernating adults were household pests in the State. Elm leaf beetle was widespread throughout ARIZONA. Chinese elm trees were severely attacked and many municipalities are gradually eliminating this elm. Four thousand trees were sprayed at Winslow in Navajo County. This pest spread to additional communities in Kane County, UTAH, and was a major shade tree pest in most localities. Damage was well above normal. Elm leaf beetle has become almost statewide in NEW MEXICO. Numbers were heavy in De Baca, Chaves, Quay, Otero, Socorro, and Sierra Counties, and light to heavy in Dona Ana, Hidalgo, Luna, McKinley, Santa Fe, and Torrance Counties. Numbers in cities in Valencia, Bernalillo, Sandoval, San Juan, and Rio Arriba Counties built up during spring and continued heavy until the leaves began to fall. This pest was again heavy in the Rolling Plains and Trans-Pecos areas of TEXAS. Damage occurred in Upton,

Glasscock, Motley, Wilbarger, Pecos, Midland, Ward, and Reagan Counties. Elm leaf beetle counts were heavy in Cotton County and increasing in all areas of OKLAHOMA by mid-May. Defoliation ranged moderate to heavy on Siberian elms in most areas during June, July, and August, and was heavy on some isolated American elms in Major County.

In KANSAS, this pest now occurs statewide. Foliar damage on Chinese and Siberian elms has been particularly severe and widespread. Controls were applied in many areas. First-generation eggs were found hatching about mid-May in Riley, Shawnee, and Sedgwick Counties. First-generation larvae were heavy on elm in Barton County in late May. Pupation of the first generation had begun by early June in Riley County and adults began emerging in late June. Second-generation larvae were found in Wichita, Sedgwick County, in early July. By late August, adults were reported starting to enter houses for overwintering. Elm leaf beetle caused heaviest damage on Siberian elm shade trees. Unless shade trees are sprayed, those infested in 1970 will also be affected in 1971 in MISSOURI. In ARKANSAS, infestations continue to cause severe damage to Chinese elms in all areas. This pest along with Dutch elm disease, and two consecutive years of extreme summer drought in northwest Arkansas, caused death to many of these trees. Very little spraying is being done. This pest defoliated many American elms in middle and west TENNESSEE during July and August. Emerging adults and first-generation larvae were observed in eastern areas in mid-May. Some damage was noted during June in eastern areas. Elm leaf beetle continued to defoliate and damage elms on lawn and street plantings from central to north ALABAMA. This pest infested Chinese elm in the Piedmont area of SOUTH CAROLINA. This pest was reported from all areas of WEST VIRGINIA. Infestations were heavy in Marion, Tucker, Randolph, and Wood Counties. Damage to elms seems to be more prevalent in northern and eastern areas. In INDIANA, the first generation was light and the second generation normal. Elm leaf beetle was reported from Monona, Montgomery, and Taylor Counties, IOWA, for the first time.

SMALLER EUROPEAN ELM BARK BEETLE (*Scolytus multistriatus*) appears to be in all southwestern areas of IDAHO. Adults were flying by April 27, ahead of the normal May 15 emergence. Spray schedules were followed only at Boise, Ada County, and at Caldwell, Canyon County, Memorial Park. In all other areas chemical treatments were not used and trees infected with Dutch elm disease were not removed. Dutch elm disease was first found in 1969 at New Plymouth, Payette County. In 1970, the disease infected 45 percent of the elms. Adults were heavy on an American elm in Laramie County, WYOMING, for a new State record. Dutch elm disease was verified from the same tree. This pest was found in the following MINNESOTA counties for new records: Rock, Nobles, Jackson, Murray, Cottonwood, Watonwan, and Brown. Emergence of the *S. multistriatus* in WISCONSIN was noted by June 5 compared with June 20 in 1969. Adult activity of NATIVE ELM BARK BEETLE (*Hylurgopinus rufipes*) was noticed on May 5 compared with May 15 in 1969. Despite heavy winter mortality, conditions were favorable so the incidence of Dutch elm disease appeared heavier than normal. Verification of *H. rufipes* has been made as far north as Sawyer and probably Bayfield County. Native elm bark beetle adults appeared in window traps in Cass County, NORTH DAKOTA, the first week of May. Morton County was a new county record. A BARK BEETLE (*Xylosandrus compactus*) continued to be a widespread pest of numerous forest and shade trees in FLORIDA, such as oak, sweetgum, magnolia, redbud, and dogwood. This pest introduces a fungus into the twigs which causes death and "flagging" of branch terminals. There is no general or practical control for this pest.

TWIG GIRDLER (*Oncideres cingulata*) was the most frequently reported beetle pest of trees in INDIANA and was more abundant than in past years. Damage in OKLAHOMA was heavy to shade trees, especially elms, during the first half of October. Heaviest reports were from Washita and Payne Counties. LOCUST BORER (*Megacyllene robiniae*) damage in UTAH remains severe in Salt Lake and Davis Counties; it has spread northward to Roy, Weber County.

ASIATIC OAK WEEVIL (Cyrtepidomus castaneus) defoliation occurred over wide areas in MISSOURI with heavy damage being concentrated in Wayne, Madison, Dent, Iron, and Texas Counties. Larval and pupal surveys were made in Madison County in late spring and early summer. Population levels in 1971 will compare with those of 1970. No suppression was attempted. Defoliation was common on oaks throughout south-central Missouri. New records were reported from Marion and Pike Counties. A SEED BEETLE (Amblycerus robinae) was found in honeylocust seed pods at Sacramento, Sacramento County, CALIFORNIA. This was a new State record. There was a major outbreak of LOCUST LEAFMINER (Xenochalepus dorsalis) in middle and east TENNESSEE during July which caused severe damage to locust trees. A peak was noted in mid-July and no spread was noted after July. This pest has continued heavy for the past several years in MARYLAND. Populations were light to moderate statewide. Areas along State Highway 50 in Anne Arundel County were the most heavily damaged.

COTTONWOOD LEAF BEETLE (Chrysomela scripta) adults and larvae caused extensive damage to native willows and elder bushes throughout TENNESSEE. In some areas, willows died.

PERIODICAL CICADA (Magicalicada septendecim) was observed on May 26 at Union Township, Hunterdon County, and at Princeton, Mercer County, NEW JERSEY. Severe damage occurred in these areas, oak was the preferred host. Extensive twig damage from the egg-laying activities were recorded in all eastern WEST VIRGINIA counties. The area of occurrence has changed very little from emergence in 1953. The Allegheny Mountain front marks the westward boundary. Brood eleven will appear in 1971 in Fayette County.

In MARYLAND, emergence of M. septendecim began May 20 and peaked June 1 in Prince Georges County. M. septendecula emerged June 1 and peaked June 8 in Anne Arundel, Baltimore, and Harford Counties. Emergence of M. septendecim occurred a week to 10 days later in the higher elevations of Washington and Frederick Counties. Rapid declines due to natural mortality occurred June 20 to July 3 for M. septendecim with M. septendecula declines a week to 10 days later. Heavy infestations of M. septendecim were reported from Prince Georges, Anne Arundel, Baltimore, Harford, Cecil, Carroll, Howard, Montgomery, Frederick, Washington, Allegany, and Garrett Counties. No other counties had emergences of Magicalicada species. Populations of M. septendecula were heaviest in several isolated areas along the Fall Line in Prince Georges, Anne Arundel, Baltimore, and Harford Counties. Damage was heaviest in northwest Baltimore City. Egg hatch occurred from July 27 to August 5. "Flags" of a PERIODICAL CICADA (Magicalicada sp.) were observed in most southern INDIANA deciduous forests and woodlots. Adults were probably as numerous in the southern district as in 1953. There is some evidence this pest was less numerous in northern Indiana. In TENNESSEE, a major outbreak of Brood X occurred during May and June in 41 counties. In most cases, no damage was reported; however, damage did occur in 16 counties.

A CICADA (Diceroprocta apache) abundantly emerged during early July in the Salt River Valley, Maricopa County, ARIZONA. Much tip damage occurred on ash, bottle-brush, carob, and mimosa. Egg laying damage and a long hot, dry summer killed many young trees. Adults of D. apache caused medium to heavy twig damage to various shade trees, especially elms, in southern Clark County, NEVADA, in July.

A MIRID (Orthotylus chlorionis) caused considerable damage to honeylocust throughout western PENNSYLVANIA. Infestations were severe enough to cause extremely shabby appearing foliage. ASH PLANT BUG (Tropidosteptes amoenus) was noted causing severe distortion of ash in Jackson County, WISCONSIN, on May 25.

COTTONY MAPLE SCALE (Pulvinaria innumerabilis) was heavy on most maples throughout central and eastern WASHINGTON. EUROPEAN ELM SCALE (Gossyparia spuria) populations were normal in UTAH. This pest appears to be an endemic problem on American elms in Santa Fe and San Juan Counties, NEW MEXICO. TERRAPIN SCALE (Lecanium nigro-fasciatum) was locally abundant on oak in SOUTH CAROLINA.

OBSCURE SCALE (Melanaspis obscura) is one of the most serious pests of oaks in central MARYLAND. Heavy infestations caused considerable "dieback" to street plantings of willow and white oaks in the College Park and Greenbelt areas of Prince Georges County. OYSTERSHELL SCALE (Lepidosaphes ulmi) was serious on willow in UTAH.

An APHID (Prociphilus fraxinifolii) infested and distorted up to 70-95 percent of the leaves on individual ash trees in Douglas, Ormsby, and Washoe Counties, NEVADA, in May and June. Pemphigus monophagus produced many galls on Populus angustifolia at Garden City, Rich County, UTAH. This was a new State record. It was a conspicuous gall maker on the same trees for at least 10 years. NORWAY MAPLE APHID (Periphyllus lyropictus) was very abundant and abnormally heavy counts were observed on leaves of Acer platanoides in several northern OREGON counties.

Weather of the week continued from page 258.

western part of the Gulf of Mexico. It caused fair skies over wide areas. Rains fell at midweek along the northern Pacific coast in connection with a storm in that area. Snow fell in the mountains. Austin, Nevada, received 6 inches of new snow Wednesday forenoon. Heavy rains along the Oregon coast Friday were accompanied by strong winds. High winds accompanied and followed a cold front passage across the northern and central Great Plains Saturday. Sunny weather prevailed over almost the entire Nation Sunday.

TEMPERATURE: A large high pressure area moved southward across the middle of the Nation in the first half of week. It brought mostly clear skies and some chilly temperatures. Eagle River, Wisconsin, registered -50° Monday morning. Freezing temperatures occurred in the Deep South at midweek. New Orleans, Louisiana, registered 32° Thursday morning. Never before had the mercury plunged to the freezing mark at New Orleans so late in the spring. In contrast to cold temperatures in the East, the Southwest was hot and southerly breezes brought a warming trend to the central Great Plains. Temperatures reached the 90's in spots in the southwestern deserts on Monday and Tuesday afternoons, and the 80's in South Dakota and Nebraska on Wednesday. Pierre and Aberdeen, South Dakota, registered 85° Wednesday afternoon. Thursday and Friday were slightly cooler, but southerly winds Saturday pushed temperature at Pierre, South Dakota, to 86° before a cold front passage. By Sunday morning, the mercury at Pierre had tumbled to 41° and it rose no higher than 56° in the afternoon. Temperatures averaged warmer than normal northwest of a line from western Texas to northern Lower Michigan, and cooler than normal southeast of that line, The Dakotas and portions of nearby States averaged 6°-10° or more warmer than normal. Parts of the Deep South averaged more than 6° cooler than normal. (Summary supplied by Environmental Data Service, ESSA.)

CONTRIBUTORS

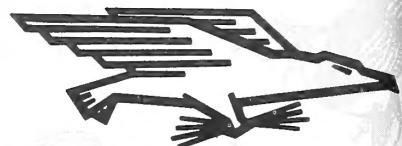
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ARKANSAS W.P. Boyer	MINNESOTA R. Flaskerd	PENNSYLVANIA S.G. Gesell
CALIFORNIA R.M. Hawthorne	MISSISSIPPI C.F. Sartor	RHODE ISLAND G. Field
COLORADO L.E. Jenkins	MISSOURI R.E. Munson	SOUTH CAROLINA W.C. Nettles
DELAWARE P.P. Burbutis J. Franklin	MONTANA C.R. Pratt	SOUTH DAKOTA P.A. Jones
FLORIDA F.W. Mead	NEBRASKA D.L. Keith	TENNESSEE C.D. Gordon
HAWAII K.F. Kawamura	NEVADA L.M. Burge	TEXAS L.R. Green
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INDIANA R.W. Meyer	NEW MEXICO G.L. Nielsen	WASHINGTON R.F. Harwood
IOWA H. Gunderson	NEW YORK A.A. Muka	WEST VIRGINIA J.D. Hacker
KANSAS K.O. Bell	NORTH CAROLINA T.N. Hunt	WISCONSIN M.S. Conrad
MAINE A. Gall	NORTH DAKOTA W.J. Brandvik	WYOMING A.E. Parshall
MARYLAND J.L. Hellman	OHIO R.W. Rings W.K. Roach	

Included in the "Summary of Insect Conditions in the United States - 1970" are the following special reports:

1. The highlights section of Forest Insect Conditions in the United States - 1970, compiled by the Forest Service, U.S. Department of Agriculture.
2. Screwworm (*Cochliomyia hominivorax*) Summary compiled by Animal Health Division, U.S. Department of Agriculture.

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