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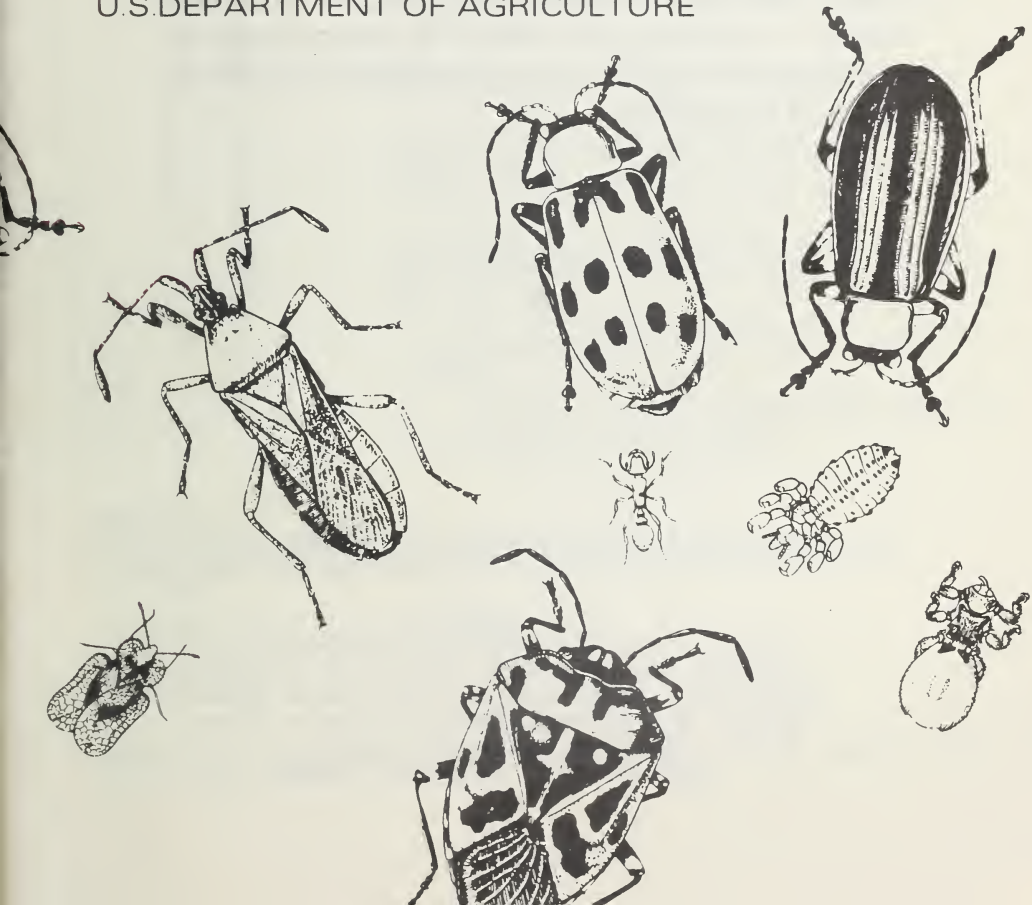
Cooperative Economic Insect Report

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PLANT PROTECTION AND QUARANTINE PROGRAMS
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ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE PROGRAMS
PEST SURVEY AND TECHNICAL SUPPORT STAFF

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 Service serves as a clearinghouse and does not assume responsibility for accuracy of the material.

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CEIR
Pest Survey and Technical Support Staff
Plant Protection and Quarantine Programs
Animal and Plant Health Inspection Service
United States Department of Agriculture
Federal Center Building
Hyattsville, Maryland 20782

COOPERATIVE ECONOMIC INSECT REPORT**HIGHLIGHTS**Current Conditions

CORN LEAF APHID increased on sorghum in southern Panhandle of Texas, heavy in southeast Kansas and southern Nebraska. POTATO LEAFHOPPER increased on alfalfa in Ohio and Wisconsin. TOBACCO BUDWORM severe on tobacco in southern Coastal Plain of North Carolina, heavy in southern Maryland. (pp. 419-420).

EUROPEAN CORN BORER first-generation larvae generally light in major corn-growing areas, continued moderate to heavy in corn throughout Maryland. Egg laying and hatch of second generation reported from several areas. CORN ROOTWORMS damaged corn in central and eastern Nebraska, and in central and northwest Missouri. (pp. 421-422).

VARIEGATED CUTWORM continued heavy on alfalfa in Nevada, heavy on seedling apples in field nursery in Marion County, Oregon. (pp. 423, 427).

BOLL WEEVIL emergence very heavy in Tennessee cotton-growing area, continued heavy in northern Alabama. (p. 424).

TOBACCO FLEA beetle damaged newly transplanted tobacco in northern Kentucky. ALFALFA LOOPER damaged several legume crops in Idaho. (p. 425).

SOUTHERN PINE BEETLE severe on pines in Piedmont and mountain areas of North Carolina, potential for severe outbreak exists in Delaware. (pp. 427-428).

FACE FLY very heavy on cattle in eastern South Dakota, annoyed cattle in Vermont. (p. 428).

GRASS BUGS damaged range grasses in Utah. GRASSHOPPERS heavy on rangeland in some Western States. (pp. 430-432).

Detection

A GELECHIID MOTH reported for first time in Pennsylvania. (p. 427).

For new county records see page 432.

Reports in this issue are for week ending June 29 unless otherwise indicated.

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NATIONAL WEATHER SERVICE'S 30-DAY OUTLOOK

July 1973

The National Weather Service's 30-day outlook for July is for temperatures to average below seasonal normals east of the Continental Divide except for near to above normal in the Northeast and near normal along the gulf coast. Above normal temperatures are indicated west of the Divide except for near normal along the north and central Pacific coast. Rainfall is expected to exceed normal over the Midwest, the south Atlantic coast, and the Rio Grande Valley. Subnormal totals are indicated for the northwest quarter of the Nation. In unspecified areas near normal rainfall is in prospect.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the National Weather Service. You can subscribe through the Superintendent of Documents, Washington, D.C. 20250. Price \$5.00 a year.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

ARMYWORM (Pseudaletia unipuncta) - DELAWARE - Larvae heavy in some corn, and in grassy pea and potato fields in Kent and Sussex Counties. Adults averaged 300 per night in several black-light traps. (Burbutis, Davis). MARYLAND - Populations declined rapidly throughout State. Heaviest infestations in no-till corn ranged 1-4 percent in Frederick, Washington, and Garrett Counties. (U. Md., Ent. Dept.). KENTUCKY - Damaged corn in Bourbon and Hardin Counties. Damage to most corn in State light compared to past 2 years. (Barnett). MICHIGAN - Blacklight trap collections diminished; very few moths now taken. (Sauer). WISCONSIN - Larvae appeared in oats, primarily in eastern area. Heaviest count, 3 per 50 sweeps in Rock County oatfield. (Wis. Ins. Sur.).

CORN EARWORM (Heliothis zea) - TEXAS - Moderate in whorls of grain sorghum in Knox County. Insignificant numbers attacked grain sorghum in Hale County. (Boring, Latham). OKLAHOMA - Eggs numerous on corn checked in Tillman County. Larvae moderate to heavy in sweet corn in Marshall County, moderate in Tulsa County. Counts in peanuts in Caddo and Washita Counties averaged one per plant. Light in alfalfa in Jackson and Greer Counties. (Okla. Coop. Sur.). MISSISSIPPI - Moderate to heavy on corn in Amite and Pike Counties. (Robinson). INDIANA - Half-grown larvae damaged sweet corn in Jackson County, first of season. (Huber).

CORN LEAF APHID (Rhopalosiphum maidis) - TEXAS - Moderate to heavy in whorls of grain sorghum in Glasscock County. Increased in many Lubbock area sorghum fields. Ranged light to moderate in most Hale County fields and in other counties near Amarillo, Potter County. Beneficial species increased; lady beetle adults ranged up to 3 per row foot in some Hale County fields. (McIntyre et al.). OKLAHOMA - Moderate in corn and sorghum in Tillman County. Lady beetles appear to be preventing increases. R. maidis ranged 50-60 per terminal in Jackson County in sorghum. (Okla. Coop. Sur.). KANSAS - Moderate to sometimes heavy in southeast district sorghum. Although noticeable foliar injury not found in area, some treatments applied. Light to moderate whorl infestations common in larger sorghum in Riley, Pottawatomie, and Wabaunsee Counties. Adult lady beetles, mainly Hippodamia convergens (convergent lady beetle), heavy and preying on aphids. (Bell).

NEBRASKA - R. maidis built up in Clay County sorghum; averaged 2.6 per plant, ranged 0-600 per 40 plants. (Gary). Heavy in southeast district; ranged from zero to 200+ per plant in 3 fields sampled in Lancaster County. Soil moisture adequate in 8-inch or taller sorghum; no stress due to this aphid visible. (Roselle). ILLINOIS - First of season light on 15-inch sorghum in Massac County. Nearly 100 percent of plants infested. (Ill. Ins. Rpt.). INDIANA - Infested most of 25 cornfields in Kosciusko County. (Engelberth).

GREENBUG (Schizaphis graminum) - TEXAS - Decreased on sorghum in Blacklands and Stephenville area. Light in Coryell, McLennan, Hill, and Bell Counties. Light to moderate in isolated fields in Glasscock County in Trans-Pecos area. Colonies ranged 1-2 per plant (averaged 4-50 individuals per colony) in most fields of 12 to 18-inch plants. Activity light in Reeves and Pecos Counties. Averaged less than 2 per plant in Hale County. Found in many fields across Panhandle. Populations light in Carson, Potter, Moore, Gray, Hale,

Castro, Lamb, and Parmer Counties. (Hoelscher et al.). ARKANSAS - Very light in one Arkansas County sorghum field. This is first record of 1973. Survey negative in 4 Prairie County fields. (Boyer). OKLAHOMA - Schizaphis graminum very light in most sorghum in Texas County, but averaged 40 per plant in one field. Beneficial species, especially lady beetles, numerous. (Okla. Coop. Sur.). KANSAS - Infestations on sorghum still generally light throughout State. Slight buildups noted on lower leaves in Riley and Wabaunsee Counties; these infestations still very light. Infestations in southwest area generally light; one Stevens County field watched closely due to presence of significant and rapidly increasing population. Averaged 117 per plant June 21, increased to 165 (6 to 8-inch plants) June 25, up to 3 lower leaves infested. (Bell).

NEBRASKA - S. graminum scattered on sorghum in southeast, central, and southern districts; few fields required treatment, but populations below economic levels in most fields. Flights still light; 6 winged forms taken in 4 yellow pan traps June 22-28 in Clay County. (Roselle, Gary). Continued to increase in Clay County; ranged 0-326 per 40 plants, averaged 2.3 per plant, in 140 sorghum fields sampled. (Keith et al.). Ranged 3-50 per plant in 3 sorghum fields surveyed in Lancaster County; some damage noted. (Roselle). SOUTH DAKOTA - This species and Macrosiphum avenae (English grain aphid) infested some varieties of spring wheat in eastern Beadle County and Brookings County. S. graminum up to 15 per head of wheat with additional aphids on lower leaves in some fields. Ratio of species in Beadle County about 50:50. Population expected to increase, treatments will probably be required first week of July. Due to extremely dry conditions, fewer greenbugs than normal will have economic impact. (Jones).

POTATO LEAFHOPPER (Empoasca fabae) - OHIO - Increased in alfalfa; heaviest counts per sweep to date averaged 4.2 in Preble and 1.4 in Darke Counties. (Fox). ILLINOIS - Light on soybeans in Logan County; caused no damage. None found in one Pope County field. (Ill. Ins. Rpt.). WISCONSIN - Continued to increase slowly. Most damage to alfalfa caused by nymphs. (Wis. Ins. Sur.). KANSAS - Ranged 0-8 per 10 sweeps in alfalfa in Wabaunsee and Pottawatomie Counties. (Bell).

TOBACCO BUDWORM (Heliothis virescens) - NORTH CAROLINA - Damage very severe in southern Coastal Plain tobacco fields. Counts in 30 fields across Sampson, Duplin, and Johnson Counties showed 15 percent of fields above threshold level of 10 percent plants infested. Fields (50+ percent) in Coastal Plain buttoning or flowering. Very little leaf damage will occur in flowering fields. (Hunt, June 22). MARYLAND - Second and third-instar larval infestation heavy (40 percent) in 50 acres of early planted tobacco near La Plata, Charles County. (U. Md., Ent. Dept.).

TOBACCO HORNWORM (Manduca sexta) - INDIANA - First adults of season taken in blacklight traps in Lagrange County June 26 and in Lawrence County June 21. (Huber).

TOMATO HORNWORM (Manduca quinquemaculata) - INDIANA - First adult of season taken in blacklight trap in Sullivan County June 18. (Huber).

CORN, SORGHUM, SUGARCANE

EUROPEAN CORN BORER (*Ostrinia nubilalis*) - KANSAS - First generation noneconomic in Brown, Doniphan, Atchison, Leavenworth, Jackson, and Nemaha Counties. Economic in some early planted corn in Douglas and Johnson Counties. Infestations up to 55 percent noted in Douglas County and 85 percent in Johnson County. Most larvae bored into plants and first through third instars noted. Egg laying complete and all eggs hatched in eastern area as far north as these counties including Riley and Pottawatomie Counties. Based on decreased moth catches in Brown and Republic Counties, egg laying should be about completed here also. (Bell). NEBRASKA - Some egg laying and hatch observed, but population light. (Koinzan, Keith). MISSOURI - Counts in corn 36-58 inches tall in northwest area ranged 16-48 percent of plants infested. Second to fourth-instar larvae ranged 0.4-3.1 per plant. Some larvae in area tunneled in leaf midribs, none noted entering stalks. (Munson).

IOWA - *O. nubilalis* egg laying peaked June 22-23 with some oviposition occurring this period. Few early planted fields nearly 100 percent infested. Majority of fields ranged 5-20 percent infested. (Stockdale). MINNESOTA - Pupation about complete. Emergence ranged from 50 percent in southwest district to 98 percent in southeast district. Reports of egg masses and larval feeding about nonexistent, as predicted in fall of 1972. (Minn. Pest Rpt.). WISCONSIN - Larval feeding evident on 2-6 percent of earliest corn in Grant, Lafayette, Rock, Sauk, and Washara Counties. Larvae mostly first instar, few second instars. Adult activity declined sharply. (Wis. Ins. Sur.).

INDIANA - *O. nubilalis* larval feeding evident on average of 22 percent of plants in 24 cornfields in Kosciusko County; corn averaged 44 inches extended leaf height. (Anderson). Fourth-instar, with occasional fifth-instar, larvae observed in southern third of State. (Huber). MICHIGAN - Blacklight collections indicate first-brood emergence near completion June 26. Few stragglers will occur, continued larval controls may be needed. (Sauer). OHIO - First-generation larvae fed in corn whorls in 2 Licking County fields; damaged 35 percent and 50 percent of plants in these fields, respectively. (Blair). Damaged about 50 percent of plants per examined field in Ashland, Wayne, Holmes, Coshocton, Perry, Belmont, Jefferson, and Knox Counties. (Musick).

KENTUCKY - *O. nubilalis* first generation light on corn, especially in northern areas. Damage evident statewide. In southern area, borers moved into whorls. In central and northern areas, larvae in the midribs near whorls. (Barnett). TENNESSEE - Survey of 15 cornfields in western area indicated stalk infestation ranged 0-10 percent; whorl feeding and punctured stalks easily found in infested fields. Now in pupal stage, adult emergence expected by mid-July. Extensive damage not expected. Damage to late-planted corn could be heavy, however, if second and third-generation larvae build up. (Gordon).

MARYLAND - *O. nubilalis* continued moderate to heavy in corn throughout State. About 20 percent of fields surveyed hosted populations in 60-90 percent range. Third-instar larvae present in most fields on lower Eastern Shore. Western county corn hosted first and second instar. (U. Md., Ent. Dept.). DELAWARE - Moths ranged 2-3 per night in blacklight traps period June 16-22 in Kent

and Sussex Counties. (Burbutis). NEW HAMPSHIRE - Ostrinia nubilalis moths light at Hudson, Hillsboro County, last 7 days of June. (Spencer).

LESSER CORNSTALK BORER (Elasmopalpus lignosellus) - ALABAMA - Full-grown larvae damaged 30-acre field of sorghum and Sudan grass in Montgomery County. Growers in Autauga County reported heavy damage to grain sorghum over wide area. (McQueen).

STALK BORER (Papaipema nebris) - MARYLAND - Caused moderate injury (5-15 percent) in no-till corn in central and Eastern Shore regions. Pest appears to be above normal in all sections this season. Full-grown larvae moved into corn from weeds along edges of fields. (U. Md., Ent. Dept.).

MAIZE BILLBUG (Sphenophorus maidis) - MARYLAND - Populations appear above normal in Kent, Queen Annes, and Cecil Counties. Heaviest infestation found near Warwick, Cecil County, where 15 percent of 25-acre corn stand damaged. (U. Md., Ent. Dept.).

CORN ROOTWORMS (Diabrotica spp.) - NEBRASKA - Damage ranged light to severe in scattered cornfields in central and eastern districts. In few cases, up to 3 and 4 rings of crown roots destroyed. Damage reported from Clay, Cuming, Lancaster, and Sarpy Counties. (Keith). MISSOURI - Damaged corn in central and northwest areas. One central area field showed some lodged plants, larvae averaged 13 per plant. (Thomas). Counts in northwest area ranged 3-28.4 larvae per plant. Severe root pruning noted in several fields; no lodging occurred. Some pupae of D. virgifera (southern corn rootworm) observed. (Munson).

SORGHUM MIDGE (Contarinia sorghicola) - TEXAS - Increased throughout much of south-central area on grain sorghum. Treatments applied in Calhoun, Victoria, Guadalupe, and Brazos Counties. Light in Bell, McLennan, Falls, and Hill Counties. Populations increased but did not require treatment. (Cole, Hoelscher).

SMALL GRAINS

WHEAT STEM MAGGOT (Meromyza americana) - MINNESOTA - Unusually heavy in south-central and southwest districts. Infestation of 40 percent noted in one Lamberton station field plot of wheat. Some wheat fields along U.S. Highway 71 seemed white due to larval infestations. Heavy infestation ranged 10-30 percent in southwest district. Treatments rarely applied as pest seldom reaches economic levels. (Minn. Pest Rpt.).

RICE WATER WEEVIL (Lissorhoptrus oryzophilus) - ARKANSAS - Adult activity very light on rice; only 6.6 percent of newly formed leaves had adult feeding signs. Root damage noted in only one field. Species now resistant to previously used insecticide seed treatment. Population suspected to be rebuilding. In most of 20 fields, growers drained for control and/or cultural reasons. (Boyer).

SAY STINK BUG (Chlorochroa sayi) - NEVADA - Moved into grain fields in Fallon area, Churchill County, and Diamond Valley, Eureka County. Small numbers of eggs present. (Lauderdale, Martinelli).

ENGLISH GRAIN APHID (Macrosiphum avenae) - NEVADA - Ranged 25-30 per head on 80 acres of wheat at Fallon, Churchill County. (Lauderdale).

TURF, PASTURES, RANGELAND

SAGEBRUSH DEFOLIATOR (Aroga websteri) - NEVADA - Heavy and caused severe damage to several hundred acres of sagebrush south of Denio, Humboldt County; between Sonoma and Tobin Ranges in Pershing County; and near South Fork of Humboldt River in western Elko County. (Collins, Mertins).

A GRASSHOPPER (Metrioptera roeselii) - NEW HAMPSHIRE - Active in meadows in Dover area of Strafford County June 26. (Mason).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - UTAH - Controls applied to several thousand acres of seed and forage alfalfa over State; results generally effective. Much stubble spraying reported following first-crop harvest. (Knowlton). NEBRASKA - Larvae ranged 1-232 (average 30.1) and adults ranged 1-53 (average 9) per 100 sweeps in 10 alfalfa fields in Gothenburg and Cozad area of Dawson County. In Lexington and Overton area of county, larvae ranged 0-5 (average 1.4) and adults ranged 0-2 (average 0.9) per 100 sweeps in 9 fields. All fields second growth, except one field in idle acres. (Manglitz, Stevens). SOUTH DAKOTA - Larvae damaged alfalfa near Spearfish, Lawrence County. Collections per 100 sweeps made June 13 as follows: Field 1 - 2,356 larvae and 298 adults in 22-inch alfalfa; Field 2 - 2,764 larvae and 458 adults in 22-inch alfalfa; Field 3 - 1,206 larvae and 203 adults in 24-inch alfalfa. All fields in bud stage, cutting had begun. (Walstrom). NORTH DAKOTA - Larvae in dryland, uncut alfalfa field in McKenzie County increased. Counts of 6,200 and 6,800 per 100 sweeps taken June 25 and 27, respectively. (Knutsen).

WISCONSIN - H. postica caused some moderate damage in few uncut alfalfa fields in Spring Green area of Sauk County; ranged up to 10 per sweep. Averaged 2 per 10 sweeps in some regrowth alfalfa. Populations similar in uncut fields further north in county. New adults common, fields being rapidly harvested. Populations light, from one per 10 sweeps to 4 per sweep in Brown, Door, Kewaunee, and Manitowoc Counties, except in few Door County fields with 7 per sweep and noticeable damage. Counts ranged 1-2 per 10 sweeps in southwest, central, and south-central areas. (Wis. Ins. Sur.). OHIO - Larvae generally light on new growth alfalfa. Averages per 50 sweeps by county: Butler 5, Preble 66, Darke 10, Paulding 4, Sandusky 21, Delaware 3. (Fox). Averaged 7 per 10 sweeps in Franklin County. (Horn).

KENTUCKY - H. postica larvae very light statewide. About 90 percent of adults in diapause in southern and central areas. (Barnett, Parr). NEW YORK - Caused very serious damage to alfalfa in Wyoming County week ending June 22. Due to inability to harvest hay at proper stage. (N.Y. Wkly. Rpt.).

VARIEGATED CUTWORM (Peridroma saucia) - NEVADA - Continued heavy on alfalfa in Douglas, Esmeralda, Lincoln, and Lyon Counties. Heavy infestations appeared in Churchill County and lighter infestations present in Eureka County. Treatments continued in all areas. (Nev. Coop. Rpt.).

ALFALFA LOOPER (*Autographa californica*) - NEVADA - All larval instars ranged 8-12 per sweep in Diamond Valley, Eureka County, alfalfa hay fields. (Martinelli, Peters).

LYGUS BUGS (*Lygus* spp.) - NEVADA - Adults moved into seed alfalfa at Reese River, Lander County; ranged 10-20 per sweep. Treatments applied. (Hilbig).

SOYBEANS

PAINTED LADY (*Cynthia cardui*) - SOUTH DAKOTA - Larvae continued heavy on Canada thistle in eastern area. Some soybean and sunflower fields treated in Codington, Deuel, Brookings, and Moody Counties. Damage in untreated fields expected to continue 7-14 days. Heavy larval migration noted crossing highways in eastern area. (Jones, Kantack). SOUTH DAKOTA - Larvae still active in soybean and sunflower fields in eastern counties. Damaged sunflowers in Brown, Roberts, Day, Marshall, Grant, Spink, Deuel, Moody, and Brookings Counties. Second brood can be expected in some areas. Large second migratory flight noted in northern Moody County June 26. Adults crossed east to west over Interstate Route 29 at 30 per minute per mile. (Jones). NEBRASKA - Larvae caused light damage to soybean fields in Burt, Sanders, and Washington Counties. (Koinzan).

COTTON

BOLL WEEVIL (*Anthonomus grandis*) - TENNESSEE - Weevil emergence very heavy throughout cotton-growing area. Estimated population expected to be about same as in 1972. (Locke). GEORGIA - Leggett trap catches light. Punctured cotton squares increased; still non-economic (less than 10 percent) in Dooly and Burke Counties week ending June 23. (Barry, Womack). ALABAMA - Live weevil counts on 8 to 10-leaf cotton continued heavy on top of Sand Mountain in Marshall County June 25. Counts light but erratic on 6 to 8-leaf cotton in counties along Tennessee Valley; most growers will probably not experience much economic damage at time of second "hatchout." Cotton later than usual, second "hatchout" not expected until August. (Murphy et al.). Little or no economic damage occurred in any of 67 counties in State as of June 22. (McQueen).

MISSISSIPPI - Few *A. grandis* egg punctures on squares found in older cotton in southern part of State. Egg punctures noted in Rankin and Noxubee Counties. (Robinson). ARKANSAS - Trap counts still heavy in Clay County; 359 taken in 10 traps. In Craighead County, 39 weevils taken in 10 traps. (Boyer). OKLAHOMA - Averaged one weevil per Leggett trap in Muskogee County. (Okla. Coop. Sur.).

BOLLWORMS (*Heliothis* spp.) - TENNESSEE - Egg laying by *H. zea* (bollworm) underway with some eggs on terminals. Some terminal feeding by first instars noted. (Locke). GEORGIA - Economic, treatments needed in several Dooly County cotton fields. Up to 10 larvae per 100 terminals noted. (Barry). ARKANSAS - *H. zea* out-numbered *H. virescens* (tobacco budworm) on sugar lines and in light traps compared to previous period. This decline comparable to situation most past years. Several *H. virescens* moths observed on corn; not common in past years, although few larvae have been collected in ears in past. (Boyer). OKLAHOMA - Eggs light in cotton

in Bryan and Muskogee Counties; few second and third-instar larvae found in Webbers Falls area, Muskogee County. One larva found on 125 plants checked in Altus area, Jackson County. (Okla. Coop. Sur.). ARIZONA - Heliothis zea eggs and larvae appeared in Yuma, Maricopa, and Pinal Counties. (Ariz. Coop. Sur.).

YELLOWSTRIPED ARMYWORM (Spodoptera ornithogalli) - OKLAHOMA - Destroyed stands of young cotton in Coal County. (Okla. Coop. Sur.).

COTTON FLEAHOPPER (Pseudatomoscelis seriatus) - OKLAHOMA - Counts per 100 terminals averaged 10 in Caddo and Washita Counties, 6 in Tillman County; ranged 0-63 in Greer and Jackson Counties. (Okla. Coop. Sur.).

TOBACCO

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - KENTUCKY - Caused 5-10 percent foliar loss to newly transplanted tobacco in northern areas. Adults averaged 3 per 100 plants in Carroll and Grant Counties; 60 percent of bottom 2 leaves destroyed in Bourbon County. Damage also reported from Warren County. (Barnett et al.).

SUGAR BEETS

SUGARBEEF ROOT MAGGOT (Tetanops myopaeformis) - NORTH DAKOTA - Adult emergence complete in Walsh and Pembina Counties; freshly laid eggs present, no hatch noted. (Kaatz). WYOMING - Damaged sugar beets in Park, Big Horn, and Washakie Counties. (Spackman).

MISCELLANEOUS FIELD CROPS

ALFALFA LOOPER (Autographa californica) - IDAHO - Larvae severely damaged alfalfa, clover, green and black peas, and lentils. Field infestations very spotted; at times range up to 50+ larvae per sweep. Damage resulted in cutting off and eating holes in vegetables, skeletonizing leaves of field crops, destroying wilted pods by notching, and severing terminals of lentils. First-generation pupation noted in Lewis County June 25 and Latah County June 28. Larvae over one inch in length not killed by treatments. (Portman).

POTATOES, TOMATOES, PEPPERS

VARIEGATED CUTWORM (Peridroma saucia) - OREGON - Larvae infested early planted fields of several varieties of potatoes in Washington County from Wilsonville to Hillsboro. Infestations very spotty. Counts up to 18 per hill or one row foot in most heavily infested areas surveyed. No larvae found in later planted fields. (Collins).

CABBAGE LOOPER (Trichoplusia ni) - NEVADA - Eggs, mostly small larvae, but some full-grown larvae infested 2,700 acres of potatoes at 10 larvae per 3 row feet in Dutch Flat and Paradise Hill area, Humboldt County. Treatments underway. (Rowe).

POTATO SCAB GNAT (Pnyxia scabiei) - WASHINGTON - Larvae fed on decaying potato seed pieces at Eureka, Walla Walla County. Some common scab lesions observed on new potato tubers not infested with larvae of this pest. (Landis).

COLORADO POTATO BEETLE (Leptinotarsa decemlineata) - NORTH DAKOTA - Adults, eggs, and larvae present in most potato fields in Walsh, Pembina, and Grand Forks Counties. Some controls applied. (Kaatz). TENNESSEE - Severely damaged potato plantings in western area. (Locke).

GENERAL VEGETABLES

BLACK CUTWORM (Agrotis ipsilon) - OREGON - Still problem to northwestern table beet growers. Infested fields in eastern Polk County June 27 show high percentage of large larvae indicating development about complete. (Penrose).

HAWAII INSECT REPORT

Corn - CORN PLANTHOPPER (Peregrinus maidis) trace in small planting of 12-inch sweet corn seedlings at Waimanalo, Oahu. Light to moderate in adjacent planting of slightly older sweet corn. Ranged 0-40 (average 6) nymphs and adults per plant. Predators nil. (Kawamura).

Fruits and Nuts - COCONUT SCALE (Aspidiotus destructor) generally light to moderate on most of 100+ coconut trees at Hawaii Kai, Oahu; sporadically heavy on few trees. Colonies increased in number and size, but should abate soon. Nymphs and adults of Telsimia nitida and Lindorus lophanthae (lady beetles) moderate to heavy on infested pinnae. Nymphs and adults of Cryptolaemus montrouzieri (a lady beetle) also light. (Kawamura).

General Vegetables - GREEN PEACH APHID (Myzus persicae) nymphs and adults light to moderate in 60+ acres of potatoes at Mililani, Oahu. Coccinella septempunctata var. brucki light. (Davis).

Ornamentals - SOUTHERN GREEN STINK BUG (Nezara viridula) nymphs and adults heavy in yard planting of Vanda joaquim at Wailuku, Maui; caused up to 50 percent bud drop. (Miyahira). All stages of GREENHOUSE THRIPS (Heliothrips haemorrhoidalis) heavy on foliage of experimental planting of Protea exima at Kula, Maui. (Mitchell). Population and damage of WESTERN FLOWER THRIPS (Frankliniella occidentalis) moderate to heavy in 2,000 square feet of potted chrysanthemums at Waianae, Oahu. (Kawamura).

Beneficial Insects - All stages of a TINGID BUG (Leptobyrsa decora) moderate on lantana in pastures at Ulupalakua, Maui. Area of establishment increased. Species originally released in area during August 1970. Heavy adult activity of LANTANA HISPID (Uroplata girardi) noted in pastures at Waihee. Mines of LANTANA LEAF BEETLE (Octotoma scabripennis) light on wayside lantana at Hilo, Hawaii; less than 5 percent of leaves affected. (Ah Sam et al.).

DECIDUOUS FRUITS AND NUTS

VARIEGATED CUTWORM (Peridroma saucia) - OREGON - Larvae heavy in layer beds of seedling apples at large field nursery near Mt. Angel, Marion County, June 27. Immatures ranged 2-3 per row foot in areas of heaviest damage. (Long, Penrose).

A GELECHIID MOTH (Trichotaphe iothalles) - PENNSYLVANIA - Larvae damaged sweet cherry in Adams County. Collected by R.B. Colburn May 17, 1973. Determined by R.W. Hodges. This is a new State record. Species is serious pest of peach in Japan. (Colburn). T. iothalles has been recorded in several coastal areas of northeastern U.S. (PPQ).

PEAR PSYLLA (Psylla pyricola) - MASSACHUSETTS - Heavy in several pear orchards in Middlesex and Worcester Counties June 18. Controls applied, results satisfactory. (Costante).

EUROPEAN RED MITE (Panonychus ulmi) - OHIO - Increased rapidly in Fairfield County apple orchard; averaged one per leaf June 18 and 18 per leaf June 25. Continued insignificant in several other orchards in Fairfield, Perry, and Jackson Counties by June 25. (Holdsworth).

PECAN NUT CASEBEARER (Acrobasis caryae) - OKLAHOMA - Infested 8-14 percent of nut clusters in untreated native pecans checked in Rogers County; larvae about half grown. Infestations ranged up to 30 percent in Pontotoc County, up to 10 percent in Coal County. Moderate in Lincoln County and light to moderate in Marshall County. (Okla. Coop. Sur.). TEXAS - Second-generation larvae emerged throughout many south-central counties. Heavy damage reported from Knox County and moderate damage reported in Young County. Feeding noted in Ward County. (Cole et al.).

WALNUT CATERPILLAR (Datana integerrima) - OKLAHOMA - First larvae of season noted on pecan trees in Perkins area, Payne County. (Okla. Coop. Sur.). TEXAS - Damaged pecans in Gonzales and De Witt Counties. Light damage noted on pecan foliage in Glasscock County. Populations increased in San Angelo area. (Cole et al.).

ORNAMENTALS

DOUGLAS FIR TUSSOCK MOTH (Hemerocampa pseudotsugata) - NEW MEXICO - Light to heavy populations damaged ornamental plantings of Douglas-fir, white fir, and blue and Engelmann spruces in 4-square mile area at Los Alamos, Los Alamos County. Defoliation evident, treatment required. (N.M. Coop. Rpt.).

AN ARMORED SCALE (Fiorinia externa) - PENNSYLVANIA - Crawlers taken on Canadian hemlock at Wharton Township, Fayette County, June 18. Heavy, caused yellowing of foliage on six to 8-inch diameter trees in an ornamental planting. Determined by G. Slesman. This is a new county record. (Nicholson).

FOREST AND SHADE TREES

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - DELAWARE - Survey week of June 22, of overwintering population showed potential for severe outbreak this season. (Burbutis, Davis). NORTH CAROLINA - Pines infested in spring turning red and dying. Aerial surveys of known infested counties conducted. First reports show new

infestations; problem expected to remain severe this summer and fall. Heaviest infestations noted in Piedmont and mountains. Salvage of infested trees urged to reduce loss. (N.C. For. Serv.).

DOUGLAS FIR TUSSOCK MOTH (Hemerocampa pseudotsugata) - WASHINGTON - Egg hatch began June 18 on Douglas-fir and grand fir at 3,000-foot level near Leavenworth, Chelan County. (Rushmore).

AN ERIOPHYID MITE (Trisetacus gemmavitiens) - OHIO - Recovered from Scotch pine in Tuscarawas County June 21. This is a new county record. (Styer).

ELM LEAF BEETLE (Pyrrhalta luteola) - DELAWARE - Larvae very heavy on elm trees throughout State week ending June 22. Caused severe feeding injury. (Burbutis, Davis). OKLAHOMA - Second-generation oviposition underway in Payne County. First-generation damage ranged 5-60 (average 30 percent) on leaf surface on 25 Siberian elms checked in Stillwater area. (Okla. Coop. Sur.). TEXAS - Increased in widely scattered areas of State on elm trees. Moderate to heavy on elms in Knox, Pecos, Andrews, Martin, Glasscock, and Reeves Counties. Still problem on Chinese elm trees in Lubbock area. (Boring et al.).

FALL CANKERWORM (Alsophila pometaria) - WEST VIRGINIA - Aerial survey of Dolly Sods area and areas northward along Allegheny front in Grant County revealed 823 forest acres 100 percent defoliated by June 26; about 1,400 acres 50 percent defoliated. (Miller).

WALNUT CATERPILLAR (Datana integerrima) - TEXAS - Heavy on oaks and other shade trees in Matagorda County area. (Vestal).

MAN AND ANIMALS

SCREWWORM (Cochliomyia hominivorax) - Total of 301 confirmed cases reported in continental U.S. during period June 17-23 as follows: Texas 39, New Mexico 42, Arizona 214, California 6. Total of 606 cases confirmed from Mexico. Number of sterile flies released in U.S. during this period totaled 136,438,800 as follows: Texas 96,622,400; New Mexico 9,502,200; Arizona 28,654,200; California 1,620,000. Total of 44,406,000 sterile flies released in Mexico. (Anim. Health).

FACE FLY (Musca autumnalis) - VERMONT - Annoyed cattle on sunny days. (MacCollom). MISSISSIPPI - Averaged 35 per face in one herd of 35 cattle in Monroe County. (Robinson). TENNESSEE - Averaged 6 per head on cattle herd in Giles County. This is a new county record. (Robinson). Light on cattle in Washington County; surveys negative in Chester and Dyer Counties. (Walker, Gordon). INDIANA - Averaged 9.8 per bull and 14.6 per steer on 5 bulls and 9 steers in single herd in Tippecanoe County. (Christiansen). SOUTH DAKOTA - Very heavy on cattle in eastern area. Up to 100 per head noted on untreated cattle in Geddes area of Charles Mix County. Ranged 25-75 per head in northern Moody County. (Kantack).

HORN FLY (Haematobia irritans) - VERMONT - Increased on livestock over State. (MacCollom). FLORIDA - Averaged 160 per animal in untreated beef herds and 29 per animal in treated herds at Gainesville, Alachua County. Determined by E. Head. (Fla. Coop. Sur.). MISSISSIPPI - Adults ranged 500-600 per head in Tallahatchie

County; averaged 300 per head in one Monroe County herd. (Robinson). TENNESSEE - Counts per head on cattle by county: Warren 300-500 on untreated herd, controls underway; Giles 20-30 on one herd, controls applied weekly; Dyer 8-10 on black cattle and 1-2 on whitefaced cattle in one herd, treated backrubbers used; Chester 0-50 on one herd. (Eisler et al.). OKLAHOMA - Ranged 300-500 per head on cattle in Marshall County. Heavy in Pontotoc, Stephens, Garvin, Coal, Hughes, and Craig Counties; moderate in Tulsa, Cleveland, and Lincoln Counties. (Okla. Coop. Sur.). TEXAS - Increased in widely scattered areas of State. Moderate to heavy on cattle where treatment not applied in Baylor, Throckmorton, Wichita, and Fisher Counties. Decreased slightly in Wichita County probably due to hot, dry weather. Light on cattle throughout Trans-Pecos area. Light on sheep and goats in Reagan and Upland Counties. Moderate to heavy on cattle in San Angelo area counties. Decreased in much of south-central area. (Boring et al.).

MOSQUITOES - ALABAMA - Larvae and adults of Culex pipiens quinquefasciatus and other mosquitoes heavy over east-central area. Weather conditions, with well-spaced rains, have been favorable for development. (Barwood et al.). TENNESSEE - Heavy in central and western areas; nuisance to campers and in late evening. (Eisler, Locke). OHIO - Light trap collections in vicinity of Toledo, Lucas County, totaled 200 for period June 10-16. Aedes vexans, Culex pipiens pipiens, Anopheles quadrimaculatus, and A. punctipennis taken. Heavier than same time in 1972. Larval collections June 22 in Washington County showed all instars present, with third and fourth instars most common. Anopheles punctipennis, Aedes vexans, C. restuans, C. territans, and C. pipiens pipiens collected. Anopheles spp. and Culex spp. adults troublesome in Highland County. (Ohio Dept. Health).

WISCONSIN - Warm, dry weather dried most temporary breeding pools. Major problems confined mostly to vicinity of wetlands; hence, heavy biting persists at scattered locations over State. Problems reported in parts of Waukesha, Vilas, Chippewa, Door, and Sauk Counties. Light to moderate annoyance to cattle reported in Chippewa, Outagamie, and Rock Counties. (Wis. Ins. Sur.). OKLAHOMA - Adults, mainly Psorophora spp., heavy in several counties in eastern half of State. (Okla. Coop. Sur.). TEXAS - Decreased slightly due to hot, dry weather in Panhandle counties. Moderate populations annoyed cattle on isolated ranches in Culberson County. (Clymer, Neeb).

TABANID FLIES - OKLAHOMA - Tabanus spp. moderate to heavy on cattle in Payne and Muskogee Counties. Chrysops spp. heavy and annoyed cattle in Coal, and humans in Payne Counties. (Okla. Coop. Sur.).

BENEFICIAL INSECTS

PAINTED LADY (Cynthia cardui) - WISCONSIN - Larvae prevalent on Canada thistle; noted over most of State. (Wis. Ins. Sur.).

LADY BEETLES - OKLAHOMA - Counts, mostly Hippodamia convergens (convergent lady beetle), heavy in alfalfa and moderate in cotton in Caddo and Washita Counties; heavy in sorghum in Tillman and Texas Counties. Ranged 5-10 per 100 plants in cotton in Jackson County. (Okla. Coop. Sur.).

AN ICHNEUMON WASP (Bathyplectes anurus) - OHIO - Attained maximum of 5 percent parasitism of Hypera postica (alfalfa weevil) larvae

at Wooster, Wayne County. (Horn).

A BRACONID WASP (Microctonus aethiops) - NEW YORK - Releases of this adult parasite of Hypera postica (alfalfa weevil) by county: Jefferson June 15, Ontario June 19, Wayne June 22. At time of releases, damage to alfalfa light in Jefferson, moderate in Wayne, severe in Ontario Counties. M. aethiops recovered for first time in Oswego, Seneca, and Chemung Counties. These are new county records. Also taken in southern Livingston County. (N.Y. Wkly. Rpt.).

A CHALCID WASP (Brachymeria intermedia) - WEST VIRGINIA - Released 2,000 adults of this pupal parasite of Porthetria dispar (gypsy moth) in Jefferson County June 20 and 1,000 adults in Berkeley County June 21. Released by J. Leonard. (Coffman).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

CEREAL LEAF BEETLE (Oulema melanopus) - NEW YORK - Heavy at two locations on Attica Prison Farm and moderate at one Silver Springs location June 22 in Wyoming County. (N.Y. Wkly. Rpt.).

PENNSYLVANIA - Averages of one egg, 2 larvae, and 3 adults per 2 row feet noted for 3 locations in Westmoreland County. Total leaf damage ranged 3-10 percent. (Garra). Larvae averaged 2 and 8, adults 9 and 20 per row foot in Butler County June 23. (Lilley). Light at College and Furgeson Townships, Centre County, June 21; larvae averaged 2 per row foot in 3 fields. Adults noted in oat-fields and in nursery. Larvae parasitized by Tetrastichus julis (a braconid wasp). (Keim). MISSOURI - Immatures collected in oat-field at Bloomdale, Ste. Genevieve County, June 6, 1973, by D.F. Courtney. Determined by R.E. White. This is a new county record. (PPQ).

EUROPEAN CHAFER (Amphimallon majalis) - OHIO - About 25 adults observed at dusk June 19 within regulated property on east side of Cleveland, Cuyahoga County. Several specimens collected for positive determination. This is first record for season. Trapping negative in other areas to date. (Barth).

GRASS BUGS - UTAH - Labops hesperius and L. hirtus eggs hatched at higher elevations in Iron and Kane Counties. Adults of Irbisia sp. discolored introduced grasses in Pinto Mountains in Iron County; mixed infestations of Labops spp. and Irbisia spp. reported in other areas. Damage to large areas of crested wheatgrass occurred at lower elevations. L. hesperius damaged crested and pubescent wheatgrass in Green Lakes area of Iron County. Cattle mostly avoided severely damaged grass. (Haws).

GRASSHOPPERS - NORTH DAKOTA - Infestations scattered along western edge of Pierce County; ranged up to 60 (average 5) per square yard in margins and up to 40 (average less than 1) within fields. Ranged up to 30 (average 8) per square yard in field margins in north-western McHenry County; ranged up to 40 in some alfalfa, clover, and stubble fields. Ranged up to 60 (average 15) per square yard in field margins in Westhope, Maxbass, Kramer, and Gardena areas of Bottineau County. Melanoplus sanguinipes and M. bivittatus dominant; ranged first to fifth instar. (Grasser, June 22). Few adult M. bivittatus noted in Cass County. (Brandvik). SOUTH DAKOTA - Cannula pellucida hatch well underway in western Pennington County. At higher elevations in northwestern Pennington

County, 50 percent of Camnula pellucida nymphs first instar, rest second stage. Near Moon, southwestern Pennington County, nymphs mostly in second instar with some first instars present. Some Melanoplus bivittatus also present in these areas. C. pellucida nymphs ranged 40-50 per square yard at Custer Airport. First through fourth stage nymphs present. In hatching bed at one Custer County location, 50 nymphs per square yard noted, averaged 20 per square yard in areas near hatching beds. Of species present, 65 percent M. bivittatus; up to fifth instar. Populations averaged 7 per square yard in other areas of Custer County. (Zimmerman).

OKLAHOMA - Grasshopper nymphs ranged 8-25 per square yard on about 20,000 acres of grassland in Carter County, 10,000 acres in Murray County, and 10,000 acres in Pontotoc County. Nymphs ranged first to fifth instar, with 85 percent in third to fifth instars. Melanoplus bivittatus, Hesperotettix speciosus, Boopedon nubilum, and M. differentialis dominant. Nymphs threatening in scattered areas in Caddo, Comanche, Greer, and Kiowa Counties but no general economic infestations developed in area. Nymphs ranged 8-25 per square yard on about 60,000 acres of rangeland in Beaver County, 40,000 acres in Ellis County, 50,000 acres in Harper County, and 40,000 acres in Woodward County; ranged first instar to adult with 90 percent in second to fourth instar. Drepanopterna femoratum, Philibostroma quadrimaculatum, Ageneotettix deorum, M. occidentalis, Aulocara elliotti, and H. speciosus dominant. Mostly M. bivittatus destroyed stands of young cotton in some areas of Caddo, Custer, and Washita Counties. (Okla. Coop. Sur.).

TEXAS - Grasshoppers heavy, defoliated edges of many Hale County sorghum fields. Also damaged fields bordering pastureland in Bailey, Lamb, and Swisher Counties. (Latham, McIntyre). NEW MEXICO - Large numbers of Trimerotropis sp. adults congregating at lights in many cities in southern part of State. (N.M. Coop. Rpt.). UTAH - Grasshoppers severe in Snowville area, Box Elder County, with damage to grain and alfalfa. (Finch, Knowlton). Spot outbreaks on rangeland observed in Snowville area, and at McCormick, Holden, and other localities in Millard County, and in local areas of Utah and Cache Counties. (Knowlton). IDAHO - M. confusus ranged 30-100 per square yard over 6,000 acres in northern Cassia County. (Pollard). In Carey, Lincoln County, second to fourth instars of Oedaleonotus enigma and M. sanguinipes, with some bandedwing and slantface species, ranged 25-30 per square yard; 100+ per square yard noted in some areas June 20, 1973. (Hopkins).

MONTANA - Melanoplus bivittatus and M. dawsoni infested 2,500 acres of rangeland in Powell County north of Ovando at rate of 10-15 per square yard. North of Avon, M. bivittatus and M. sanguinipes up to 100 per square yard on 10,000 acres. In Lewis and Clark County, M. bivittatus and M. sanguinipes ranged 5-20 per square yard. M. bivittatus at Coffee Creek, Fergus County, ranged up to 100 per yard on 1,000 acres. In Blaine County, this species ranged up to 100 per square yard on 1,200 acres. (Pratt). OREGON - Melanoplus spp. not developing in Malheur, Harney, and Morrow Counties as in 1972. Economic in some areas of Wallowa and Umatilla Counties; little rancher interest noted in cooperative programs. (Goeden et al.). NEVADA - Melanoplus bivittatus, M. sanguinipes, and Oedaleonotus enigma ranged 35-40 per square yard on 130 acres of grain at Orovada, Humboldt County. M. bivittatus and M. sanguinipes ranged 3-5 per square yard on 160 acres of wheat in Diamond Valley, Eureka County. (Martinelli et al.). M.

bivittatus, M. sanguinipes and O. enigma ranged 10-15 per square yard on 130 acres of alfalfa at Orovada, Humboldt County. M. bivittatus and M. sanguinipes ranged 4-6 per square yard in several alfalfa fields in Diamond Valley, Eureka County. (Martinelli et al.).

GYPSY MOTH (Porthetria dispar) - CONNECTICUT - Feeding injury decreased rapidly; larvae pupating. Some adults expected next few days. (Kersting). MARYLAND - Larval finds in Cecil County continued. Five larvae collected from Elk Neck Peninsula June 19; one larva collected at Craigtown June 20, by J. Pecor. (U. Md., Ent. Dept.).

JAPANESE BEETLE (Popillia japonica) - NEW HAMPSHIRE - First adult activity of season reported June 28 in southern area in Hillsboro and Strafford Counties. (Dyrac, Reeves). MASSACHUSETTS - First adults of season noted on roses June 18 in Hampshire County. (Blyth). PENNSYLVANIA - Pupae and adults noted in turf in Harrisburg area, Dauphin County; mainly pupae. Some transformed to adults but none found above ground as of June 25. (Simons). OHIO - Noticeable adult emergence began June 25-26 in Akron, Summit County, and in Wayne County. Peak emergence in these areas should occur with several days of warm, sunny weather. (Lawrence). WEST VIRGINIA - First adults of season in Roane County noted June 25. (Atkins). MARYLAND - Adult emergence peaked in central area. Still light statewide, local moderate to heavy infestations reported from St. Marys, Charles, Prince Georges, and Baltimore Counties. St. Marys County seems most heavily infested area in State. (U. Md., Ent. Dept.).

VIRGINIA - First of season reported in Prince Edward County June 18, in Montgomery County June 22. (Perry). SOUTH CAROLINA - Adult emergence heavy in Oconee, Pickens, and Greenville Counties. Defoliated several plum trees and severely damaged grapes and roses at one location in Oconee County. Controls applied. (McCaskill). TENNESSEE - Adult emergence heavy in northern part of eastern area. (Quillin, Hammett).

DETECTION

New State Record - A GELECHIID MOTH (Trichotaphe iothalles) - PENNSYLVANIA - Adams County. (p. 427).

New County Records - HOLLYHOCK WEEVIL (Apion longirostre) VIRGINIA - Adults taken in Albemarle County June 20 by J.E. Roberts, Sr. (Allen).

A SOFT SCALE (Pseudophillipia quaintancii) VIRGINIA - Adults collected by G. Breeden in Greensville County June 22, 1973. Determined by M. Kosztarab. (Allen).

AN ARMORED SCALE (Fiorinia externa) PENNSYLVANIA - Fayette (p. 427). A BRACONID WASP (Microctonus aethiops) NEW YORK - Oswego, Seneca, Chemung (p. 430). CEREAL LEAF BEETLE (Oulema melanopus) MISSOURI - Ste. Genevieve (p. 430). AN ERIOPHYID MITE (Trisetacus gemmavitiens) OHIO - Tuscarawas (p. 427). FACE FLY (Musca autumnalis) TENNESSEE - Giles (p. 428).

WEATHER OF THE WEEK ENDING JULY 2

Reprinted from Weekly Weather and Crop Bulletin supplied by Environmental Data Service, NOAA.

HIGHLIGHTS: For the first time since early March, the entire length of the Mississippi River was back within its banks; meanwhile from 2 inches to 5 inches of rain caused severe flash flooding in New England. The Nation's western half was hot, with large areas 6 degrees or more above normal, and several records broken. The Nation's eastern half remained cooler than normal, except for New York, New England, New Jersey, and an area of Mississippi and bordering States.

PRECIPITATION: A Low drifted slowly across Canada all week. Last Monday it was centered over Saskatchewan; by mid-Thursday it had proceeded to upper Michigan; then it drifted north and was centered over Hudson Bay late Sunday. The cold front extending from the Low brought hail and tornadoes to the Corn Belt most of the week, and over the weekend dumped heavy rains on New England. Wilmington, Vermont, got nearly 5 inches of rain in 6 hours on Saturday. While Vermont had major flooding, minor floods flashed as far south as Philadelphia. Monday, the front triggered tornadoes and hail throughout Minnesota. Funnels harassed lakeside vacation areas near Brainerd. At International Falls, 1.5-inch hail fell, while golf ball-size hail struck Danbury. Early Tuesday severe weather invaded the eastern Corn Belt: Bands of thunderstorms erupted; 16 tornadoes struck five States bordering the Great Lakes in the afternoon. During one severe storm, airport wind instruments were destroyed at Detroit, Michigan, after recording 95 m.p.h. winds. Wednesday, thunderstorms continued in the eastern Corn Belt and to the east. Cities receiving 1.50 inches or more of rain on Tuesday and Wednesday included Cincinnati, Ohio, Evansville, Indiana, and Louisville and Lexington, Kentucky. Hopkinsville, Kentucky, got 2.01 inches in 6 hours on Wednesday. Thursday and Friday, the front brought bad weather to the East. Tornadoes struck Wilmington, Delaware, and Canton, Connecticut. Thursday, Wake Forest, North Carolina, got 6.05 inches of rain, Rocky Mount got 4.71 while the Raleigh-Durham area measured 4.25 inches. Friday and Saturday, the North got a soaking: Poughkeepsie, New York, 5.55 inches of rain Friday, while several locations in Vermont and New Hampshire recorded rainfalls of 4 inches or more. New England rains continued into Saturday, and floods came. Rivers jumped banks at Rutland, Vermont, and Plymouth, New Hampshire, and 80 automobiles were almost covered with water at the Albany, New York, airport. Elsewhere, scattered storms struck the Nation: Four-inch hailstones struck the Odessa, Texas, area, Friday; in Butler County, Nebraska, 4 inches of quite small hail fell, drifting up to 5 feet in ditches and completely destroying crops in an area 3 miles wide and 8 miles long. California and the Southwest received little or no rain. Lubbock, Texas, recorded its driest June since 1934 (0.33 inches of rain) and its driest May and June since 1911 (0.75 inches of rain).

TEMPERATURE: In the West, most of Utah and Nevada, and parts of States bordering them baked in temperatures 6 degrees above the norm. Intense heat returned to some areas day after day, establishing records. A Thursday high of 114 degrees at Phoenix, Arizona, broke records back to 1932. Sunday temperatures at Denver (90 degrees) and Pueblo (103 degrees), Colorado, and at Scottsbluff,

Nebraska, (101 degrees) broke all records. El Paso, Texas, recorded 108 degrees, the hottest since 1886 for the date. Furnace Creek, Death Valley, California, lived up to its name Thursday: The mercury registered 123 degrees in the afternoon, while soil temperature at 2.5 inches deep was 192 degrees. The lingering cold front kept most of the Nation's eastern half from 1 degree to 6 degrees below normal for the week. Ironically, New England, where the front caused floods, stayed from 3 degrees to 9 degrees above normal. The cold front didn't arrive till the weekend--previously a High in the Atlantic pumped warm air into the area and even northern Maine had early and midweek highs in the high 70's and low 80's. Monday, the Saskatchewan Low's cold front pushed toward the Mississippi. Ahead of the front, Iowa and Nebraska temperatures hit the 80's and low 90's, while Kansas sweated in high 90's and low 100's. By early Tuesday, cool air engulfed Iowa and Nebraska. The front moved very slowly through the eastern Corn Belt, which averaged from 3 degrees to 6 degrees subnormal for the week. Over the weekend, while this front met some warmer than normal air in New England, another large Low pressure system built up north of Montana, and its cold front extended through the Dakotas and Nebraska, into Colorado and Utah.

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