meeting dates

Oregon Park and Recreation Society, annual conference, Sun River, Ore., Oct. 13-15.

Southern California Turfgrass Council, 14th annual exposition, Orange County Fairgrounds, Costa Mesa, Calif., Oct. 23-24.

Central Plains Turfgrass Conference, K-State Union, Kansas State University, Manhattan, Kan., Oct. 23-25.

Sprinkler Irrigation Association, annual convention, Buena Vista, Fla., Oct. 27-30.

Turf and Landscape Irrigation Seminar, Northern California Turfgrass Council, Asilomar Conference Grounds, Pacific Grove, Calif., Nov. 8-10.

American Society of Agronomy, convention, Chicago, Ill., Nov. 10-15.

Tidewater Shade Tree Conference, Norfolk Botanical Gardens, Norfolk, Va., Nov. 12.

8th Annual Turfgrass Conference, Clemson University Cooperative Extension, Clemson, S.C., Nov. 12-13.

Nebraska Weed Control Conference, Scottsbluff, Neb., Nov. 12-14.

Metropolitan Shade Tree Conference, Lubber Run Recreation Center, Arlington, Va., Nov. 14.

Georgia Golf Course Superintendents Association, University of Georgia, 5th annual turfgrass short course, Nov. 24-26.

New Jersey Turfgrass Expo '74, educational conference and trade show, Sheraton Poste Inn, Cherry Hill, N.J., Dec. 2-5.

Midwest Association of Golf Course Superintendents, 22nd annual turf clinic, Medinah Country Club, Medinah, Ill., Dec. 3.

Ohio Turfgrass Conference and Show, Ohio State University, Columbus, Ohio, Dec. 3-5.

National Agricultural Aviation Association, convention/exposition, Las Vegas, Nev., Dec. 3-7.

Delaware Turfgrass Conference, John M. Clayton Hall, University of Delaware, Newark, Del., Dec. 9.

New England Chapter, ISTC, 11th annual meeting, Kings Grant Motor Inn, Danvers, Mass., Dec. 11-12.

Western Association of Nurserymen, trade show and 85th annual meeting, Plaza Inn, Kansas City, Mo., Jan. 5-7.

Tennessee Turfgrass Association, annual conference, Sheraton South Motor Inn, Nashville, Tenn., Jan. 6-7.

Penn-Del Chapter, ISTC, Marriott Motor Inn, Philadelphia, Pa., Jan. 8-9.

Kansas State Shade Tree Conference, K-State Union, Kansas State University, Manhattan, Kan., Jan. 9-10.

California Weed Conference, Sheraton Inn, Fresno, Calif., Jan. 20-22.

New Jersey Recreation and Park Association, 9th annual symposium, Labor Education Center, New Brunswick Campus, Rutgers University, Jan. 21.

DeSalvo Elected President Of Pesticide Association

Henry DeSalvo, director of the Feed, Fertilizer and Pesticides Division of the Arkansas State Plant Board, was elected president of the American Association of Pesticide Control Officials at the annual meeting in Atlantic City, N.J., in August. The Pesticide Control Officials Association is international in scope with members from each of the 50 states, Canada and Puerto Rico.

The objectives of the Association are to promote uniform and effective legislation, definitions, rulings and enforcement of laws relating to the control of the sale, distribution and use of pesticide to encourage and sponsor the adoption of the most effective and adequate method of analysis of pesticides; to develop high standards of pesticides inspection techniques and procedures; to promote adequate labeling and safe use of pesticides; to provide facilities and opportunities for free exchange of information, discussion and cooperative study of problems confronting members of the Association; and to cooperate with members of industry in order to promote the usefulness and effectiveness of pesticide products.

DeSalvo, who served the Association as president-elect the past year, succeeds M. R. Van Cleave of Iowa.

Indian Scientists to Study Insect Pest Pathogens

Research on entomology will be conducted by Indian scientists under a foreign currency grant awarded by the USDA.

Scientists at the G. B. Pant University of Agriculture, Pantnagar, will conduct a three-year survey for pathogens of insect pests. The long range objectives of this project are to isolate, identify and implement control of important insects. This project is part of USDA's continuing efforts to find safe and effective biological controls.

All foreign agricultural research done under the Special Foreign Currency Research Program is administered by USDA's Agricultural Research Service (ARS). This program, under the Food for Peace Act, provides for the effective use of U.S.-owned foreign currencies which cannot be converted into dollars, but which may be used for scientific research beneficial to U.S. agriculture and the American consumer. The grant will be paid for with Indian rupees available to the U.S.

Dr. Arthur M. Heimpel, Beltsville, Md., is the ARS-cooperating scientist for this grant of 214,800 rupees (equivalent to $26,650).

Toro's Irrigation Classes Offered at Five Locations

For the first time since its creation in 1972, the "Irrigation Institute" of The Toro Company's Irrigation Division will offer tech-

(continued on page 41)

ROSELLE

WOODBURY

Two Honored by Agricultural Chemicals Association

The board of directors of the Midwest Agricultural Chemicals Association has selected two outstanding contributors to the agricultural-chemical field in the U.S. to receive the Special Directors Award this year.

Robert E. Roselle, extension entomologist with the University of Nebraska in Lincoln, Neb., has been selected as one of the recipients. Roselle has been associated with the University of Nebraska since 1952. In the past, he has received the USDA Superior Service Award and is a charter member of the Backyard Farmer Panel on educational television.

The second recipient is Herbert A. Woodbury. Woodbury is one of the pioneers in the agricultural-chemical business and was a founder of the Woodbury Chemical Company. Woodbury was active in the company until 1969 when the Woodbury family sold their stock to farmland industries. He now travels and teaches for the United Nations, helping underdeveloped nations increase their food production.

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Infrared Aerial Photography — Easier Than You Think!

By W. E. Wildman and J. K. Clark

William Wildman (pilot) is soils specialist and Jack Clark (with camera) is photographer with the University of California Cooperative Extension at Davis. Wildman became interested in aerial photography several years ago, taking his own pictures while piloting the plane. In 1973, he teamed up with Clark to assess the value of low cost infrared aerial photography as a management tool. They have taken over 9000 paired color and infrared slides of a variety of crops and landscapes throughout California.

YOU'VE HEARD of infrared. Maybe you don't know quite what it means, but you've seen some curiously beautiful pictures with shades of red where green plants ought to be. You've heard that it's a new kind of photography that promises to discover plant diseases and other problems before you can see them with your eyes. Let's look at this interesting new tool, see in simple terms how it differs from ordinary photography and find out how it may be useful to us.

First, what is infrared, anyway? Briefly, infrared is a part of the broad energy spectrum which starts at the short wavelength end with cosmic rays, gamma rays and X-rays. A little way up the wavelength line comes ultraviolet radiation, then with increasing wavelength, visible light, infrared, microwave and finally the long radio waves. Scientists don't yet understand all they know about this electromagnetic spectrum, but that doesn't stop it from being enormously useful to us in many ways.

Visible light covers only a small part of the total energy band. Infrared covers a much broader portion, and herein arises a source of some confusion. A large part of the infrared band, the so-called "thermal infrared," is the result of heat emitted from objects. Infrared color or black and white films do not record thermal infrared, but are sensitive to the "near infrared" radiation which is reflected from objects. The near infrared reflectance is not a function of the temperature of the object. If it were, green plants would be the warmest things in the picture, and we know this is not the case. Some people prefer to call this radiation "photographic infrared." If our eyes were sensitive to it, we might see it as an additional color.

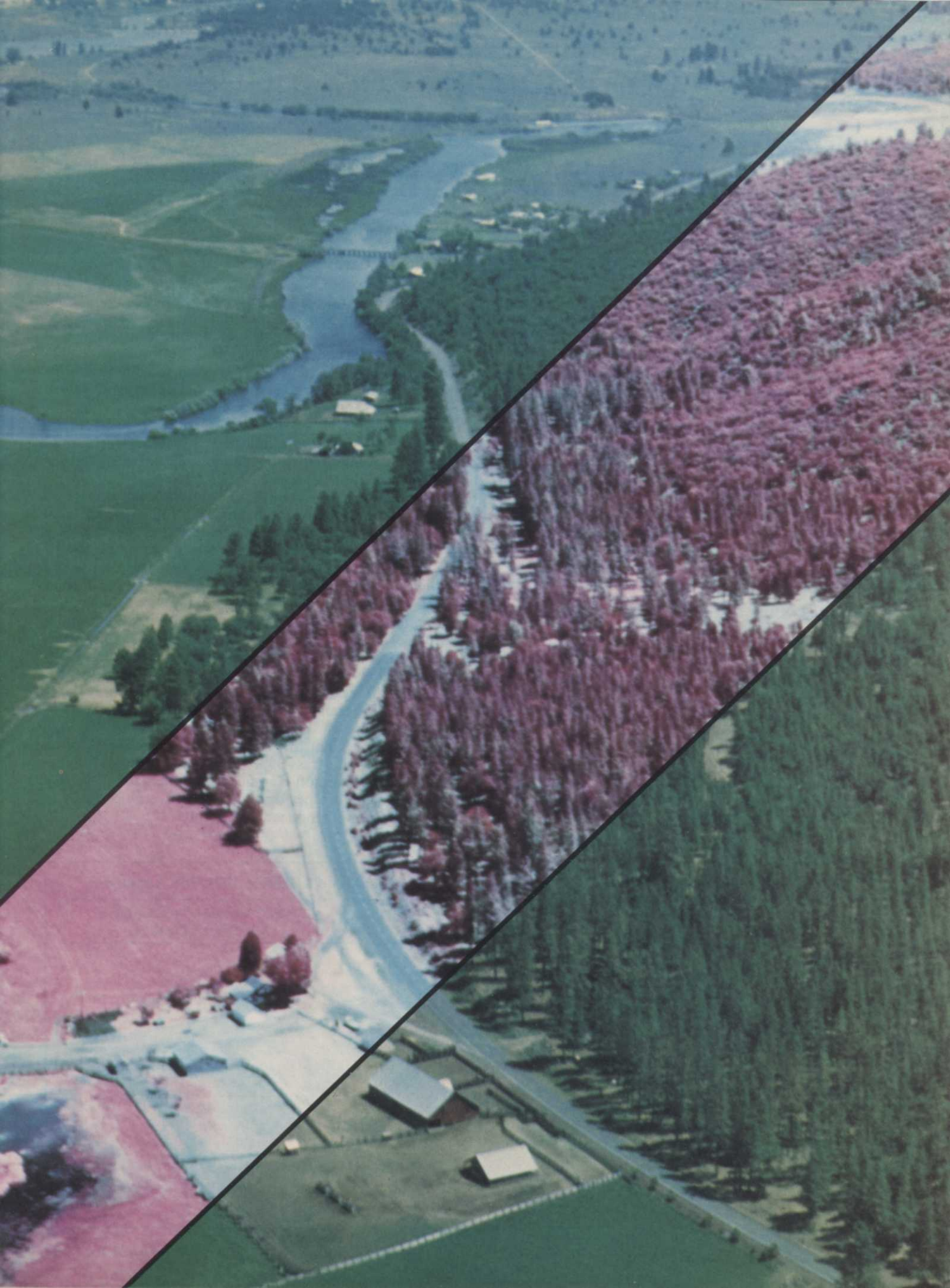
To understand the similarities and differences between ordinary color film and infrared color film, imagine a color picture of a girl resting on a hillside. Ordinary color film is sensitive to the complete visible spectrum and contains three layers sensitive to blue, green and red light. Dyes formed in these layers during processing produce a true color image. Visualize the various colors in the picture — green grass, blue sky, the girl is holding a red flower and wearing a blue cap.

If you were to look at an infrared color picture of the same scene, the most striking difference would be that the green grass is now red. You would also notice that the red flower is now yellow, and the blue cap is red. This is called a false color image. The film is recording only part of the visible light spectrum, the green and red bands, and is also sensitive to the near infrared portion of the spectrum. This film uses the same dye colors as ordinary color film but the dyes are developed by different wavelengths than they are in color film. Hence, false colors result in the final picture, and there is a purpose in this.

Healthy green plants reflect, in addition to green light, large amounts of near infrared radiation. Nothing else in the landscape reflects this combination of radiation. The false color assignment of dyes to sensitive layers of infrared color film results in green plants appearing in various shades of red.

(continued on page 44)

Right: This composite picture, made from ordinary color and infrared color slides, is the companion picture to the cover. Notice that the pine trees with a fungus disease are more easily detected in the infrared portion of the photo.



Profile of an Industry

By JOHN R. HALL, University of Maryland
and
GEORGE B. ROCHE, Marketing Specialist, Maryland Department of Agriculture

A SURVEY was conducted by the University of Maryland, Department of Agronomy, and the Division of Marketing of the Maryland Department of Agriculture in December 1973 to determine the market availability of sod in Maryland. Over 80 sod farmers in the state participated in the survey making it the most recent comprehensive acreage survey of the Maryland sod industry. The results of this survey are of value to sod producers as they attempt to anticipate supply-demand pressures and make plans for production and marketing. In the presence of high interest rates and continuing sewer moratoriums, the need to make professional marketing decisions is of utmost importance.

In December of 1973, Maryland sod producers indicated that 5,699 acres of sod would be ready for sale in 1974, 5,555 acres would be in intermediate stages of maturation and 1,896 acres of sod were yet to be planted. This survey indicated that Maryland's total acreage committed to production of cultivated sod for 1974 was approximately 13,150 acres.

Fifteen of Maryland's 23 counties have acreage in sod production. Montgomery, Carroll, Howard and Harford counties are the leaders in sod production with 37.6%, 13.1%, 12.1% and 12.1% respectively (Table 1).

There are many types of sod available to the sod buyer in Maryland including warm-season and cool-season grasses, single varieties, mixtures and blends. The greatest amount of sod produced in Maryland is a mixture of 40% improved Kentucky bluegrass, 40% South Dakota Certified Kentucky bluegrass and 20% Pennlawn red fescue (Table 2). The majority of the acreage is in the Maryland Department of Agriculture Certification Program.

Performance observations made throughout the state indicate that the 30-30-30-10 blends (30% Merion Kentucky bluegrass-30% Improved Kentucky bluegrass-30% Common Kentucky Bluegrass-10% Creeping Red Fescue) are performing well and rapidly rising in consumer and producer desirability.

(continued on next page)

Table 1: Total Sod Production Acreage in Counties of the State of Maryland.

County	% of Maryland's Acres	Total Sod Acreage
Caroline	868	6.6
Carroll	1730	13.1
Cecil	480	3.6
Charles	158	1.2
Frederick	195	1.5
Harford	1587	12.1
Howard	1593	12.1
Montgomery	4958	37.6
Prince George's	605	4.6
Queen Annes	749	5.7
Other Counties*	227	1.7

*Allegheny, Anne Arundel, Dorchester, Kent & Worcester County Combined Acreage

Table 2: Sod Available in Maryland in 1974 by Type and % of Maryland's Salable 1974 Sod Acreage.

Type of Sod		% of Maryland's Salable 1974 Sod Acreage
Single Varieties		
Kentucky bluegrass		9.7
Bentgrass		0.1
Bermudagrass		0.5
Tall Fescue		0.9
Zoysia		0.3
	Sub-Total	11.5
Mixes		
40%-40%-20% (K. Blue-K. Blue-Creeping Red Fescue)		41.3
30%-30%-30%-10% (K. Blue-K. Blue-K. Blue-Creeping Red Fescue)		20.4
90%-10% (K-31 Tall Fescue-K. Blue)		9.9
	Sub-Total	71.6
Other Mixes		7.9
Straight Bluegrass Blends		9.1

green industry

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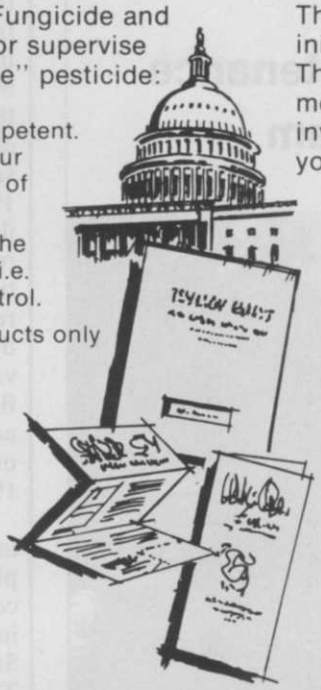

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PROFILE *(from page 36)*

The addition of the third variety of Kentucky bluegrass appears to add increased disease resistance and greater multi-season performance potential to this sod mixture.

The agricultural economic impact of the Maryland sod industry continues to increase (Table 3). Neither Maryland nor the USDA tabulate annually the cash receipts from sod production. However, figures were computed using 1971 Maryland State Board of Agriculture estimates.[1] The average value of an acre of sod sold on a cash first sale basis ($1,205), coupled with 1972 estimates of sod acreage sold, illustrates that the sod industry represents an important agricultural product in Maryland on a cash receipt basis. This value for sod production is most likely a conservative estimate as the sod value figures were for 1971 and the acreage figure represented only 75% of the acreage available for sale in 1972.

The 13,150 acres of sod currently in production in Maryland multiplied by the 1971 average installed cost of $3279 per acre[1], illustrates an increase of the Maryland Gross State Product of 43 million dollars. These tangible effects of the sod industry upon the agricultural economy of the State of Maryland are important, but perhaps not as important as the intangible effect of quality sod upon the health, happiness and well-being of Marylanders.

Without question, sod ranks as the most effective soil erosion deterrent. Its dollar value, both as a contributor to soil conservation and to air quality, is beyond measure.

References

[1]Miller, William R., 1972, The Commercial Sod Industry in Maryland 1971, Publication No. 55, Maryland State Board of Agriculture, July 1972, 6pp.

[2]Bookout, Byron R., 1974 Maryland Agriculture Statistics — Annual Summary for 1973, Maryland Crop Reporting Service, Publication 11, June 1974, 68 pp.

Table 3: 1972 Crop Cash Receipts on a Cash First Sale Basis From Farming in Maryland.[1,2]

Crop	1971	1972
Corn	28,039,000	$34,561,000
Tobacco	23,123,000	$23,081,000
Soybeans	19,014,000	$22,070,000
SOD	3,672,000	$ 5,440,000
Wheat	5,005,000	4,379,000
Apples	3,953,000	3,696,000
Snap Beans	2,013,000	2,805,000

insect report

Information from USDA Cooperative Economic Insect Report dated September 20, 1974

TURF INSECTS

SOD WEBWORM

(Crambus trisectus)

MARYLAND: Larvae heavily damaged 15 acres of bluegrass sod near Olney, Montgomery County, averaged 5 per square foot. MICHIGAN: Adult flights numerous in central area, particularly in lush grass. No controls suggested this year. Sod should be assessed for damage in spring 1975 and appropriate action taken if necessary.

BENEFICIAL INSECTS

DILARID

(Nallachius americanus)

KENTUCKY: Adult male collected in blacklight trap near Anton, Hopkins County. This is a new county record. Larvae of this neuropteron are predaceous.

SCOLIID WASP

(Scolia dubia)

MARYLAND: Adults active in several areas of Prince Georges and Charles Counties over past 21 days. Heaviest counts ranged 50-250 per acre. Activity appears above normal this season.

TREE INSECTS

BALSAM WOOLLY APHID

(Adelges piceae)

OREGON: Collected on subalpine fir *(Abies lasiocarpa)* at head of Tiger Creek in Umatilla National Forest, Umatilla County. This is a new County record and significant extension of range as this aphid only previously known from west side of Cascade Range in State. Survey underway to determine extent of infestation in Blue Mountains.

ASIATIC OAK WEEVIL

(Cyrtepistomus castaneus)

WEST VIRGINIA: Adults collected on pin oak in Greenbrier County near White Sulphur Springs. Adults collected on white oak at Wheeling, Ohio County. These are new county records.

COTTONWOOD LEAF BEETLE

(Chrysomela scripta)

NEW MEXICO: Light to heavy activity noted on *Populus* spp. and *Salix* spp. near Los Lunas, Valencia County, and Albuquerque, Bernalillo County. One row of cottonwoods in Albuquerque area severely damaged. All stages of insect currently active.

FALL WEBWORM

(Hyphantria cunea)

MISSOURI: Nearly full-grown larvae ranged light to moderate throughout central and southern areas. Webs observed on persimmon, wild plum, walnut, pecan, and many other trees.

ARBORVITAE LEAFMINER

(Argyresthia thuiella)

MICHIGAN: Severe damage to cedar and arborvitae noted in many northern counties. Trees brown and foliage dropped as result of larval leafmining. Valuable specimens may be protected in 1975 with chemical spray. Little can be done to limit populations under forested situations.

VARIABLE OAKLEAF CATERPILLAR

(Heterocampa manteo)

MICHIGAN: Larval development delayed about 14 days due to unseasonably cool weather. Parasitism averaged 74 percent, will greatly reduce population.

ORANGESTRIPED OAKWORM

(Anisota senatoria)

MARYLAND: Heavy outbreak noted on various oak species planted along highways and U. S. Interstate highway 70-S in Montgomery County. Many trees completely defoliated.

WALKINGSTICK

(Diapheromera femorata)

OKLAHOMA: Light numbers taken from blackjack oak 7 miles north of Sallisaw, Sequoyah County. This is a new county record.

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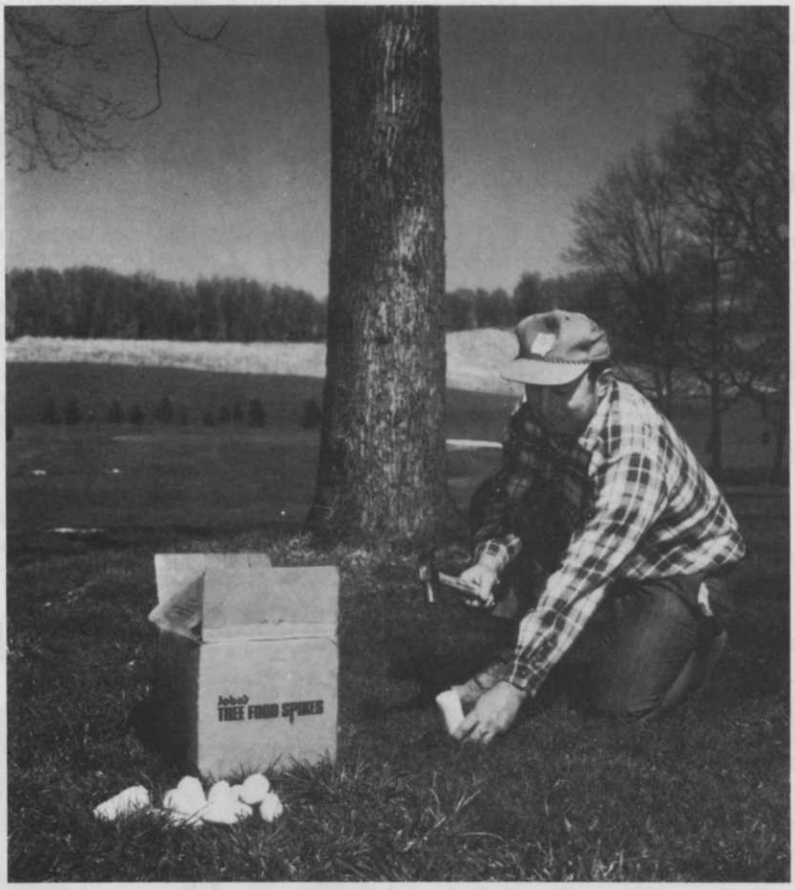

William Kobel, Superintendent, Union Country Club, Dover — New Philadelphia, Ohio

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