EPTC in starch form is more persistent

Losses of the herbicide EPTC in or on the soil surface can be greatly reduced when used in a new starch encapsulated form, research at Purdue University shows. EPTC (S-ethyl dipropylthiocarbamate) is used to control many grass and broadleaf weeds.

Findings in the study, which sought to establish the effectiveness and persistence of the starch form of EPTC, were presented recently by Dr. Marvin M. Schreiber, Agricultural Research Service-U.S.D.A. plant physiologist at Purdue.

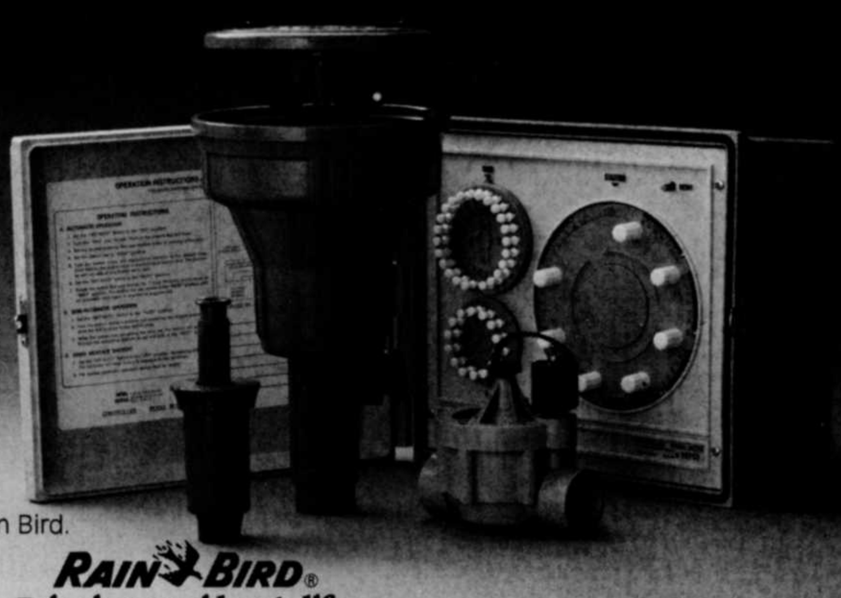
Speaking to the North Central Weed Control Conference, Dr. Schreiber pointed out that EPTC has some drawbacks in the emulsifiable concentrate (EC) liquid form.

"Because of its volatility in the liquid form, EPTC must be immediately incorporated into the soil after application," says Schreiber. "Furthermore, it is readily lost if applied to wet soil surfaces or if the soil becomes wet immediately after its application."

Research at Purdue demonstrated that EPTC in double starch encapsulated granules was six times as effective as an equivalent amount of the liquid form and three times as effective as twice as much of the emulsifiable concentrate, when applied three pounds to the acre.

The plant physiologist noted that excellent control of all vegetation (in the experimental plots) was obtained 105 days after treatment, using six pounds per acre of the double starch form.

Schreiber concluded that "the effectiveness and persistence of this new formulation may be extremely valuable in treatment for weeds that germinate over extended periods of time."



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Repairing irrigation pumps can increase your profits

Repairing worn irrigation pumps is a profitable move, according to U. S. Department of Agriculture researchers.

Research on a well at Texas A&M University Research Field at Etter proved this beyond a doubt. Having pumps in good repair was good business before high priced energy, but is now a necessity say Dr. Arland Schneider, Agricultural Research Service Engineer, and Dr. John Shipley, Texas Agricultural Experiment Station Economist, from the USDA Research Center at Bushland.

They carefully measured pump efficiency and cost and found that replacing a worn-out pump bowl assembly decreased electricity cost from $22.48 to $15.69 per acre-foot. Calculations showed that reduced electricity cost will pay for the repairs in the 1977 pumping season.

The old pump at the Etter Research Field was installed in 1964, and pumped 1,000 gallons per minute until 1972. Then it started pumping erratically and dropped to 500 gallons per minute by 1976, according to Dr. Shipley.

That was not enough water to carry out experiments at the Research Field. Rather than just change the pump, Shipley took the problem to Dr. Schneider. They decided to do a thorough study on the pump to determine both energy cost and efficiency of operation. With good information in hand, the scientists could then calculate the profitability of making repairs.

The worn-out pump produced 500 gallons per minute, and lifted water 290 feet, but the pump operated at only 49 percent efficiency. Installing the new pump bowl assembly increased the pumping rate to 750 gallons per minute. With a higher pumping rate, drawdown increased and total lift was 325 feet. Under these conditions, pumping efficiency was increased to 79 percent.

Repairs cost $3,228.00, but the scientists figured that repayment would take only 143 days of pumping.

The researchers point out that water cost can be calculated rather easily. Pumping rate, energy consumption, and energy cost must be known or determined. Accurate pumping rates can be measured with an inline propeller-type meter.

Water meters can be equipped with quick couplers and placed anywhere in a surface irrigation pipe. The meter records the number of gallons of water passing through the pipe. Keeping records for one hour gives an accurate output for a well. "A meter costs about $400.00 but would be a good investment," Dr. Schneider says. "Knowing the amount of water being applied to crops is just good business," he continued.

Keeping track of natural gas or electrical energy use for at least 2 hours on company meters gives an accurate measure of energy consumption. The cost of fuel or electricity must be known also. An acre-inch of water is 27,000 gallons. With these figures in hand, a little arithmetic gives the cost of an acre-foot of water.

The following calculations were made by Schneider and Shipley before repairing the well at Etter. It took 64.8 kilowatt hours of electricity to run the pump one hour. Electricity cost 3.2 cents per kilowatt hour. Multiplying the two figures gives a pumping cost of $2.07 per hour. At 500 gallons per minute, the well produced 30,000 gallons an hour. Dividing 27,000 into 30,000 gallons shows that the well pumps 1.11 acre-inches per hour. Water cost per acre-inch is $2.07 divided by 1.11 or $1.87. Multiplying $1.87 by 12 shows that cost per acre-foot of water is $22.44.

Calculating pump efficiency is more complicated and the two scientists suggest obtaining outside help.

Circle 113 on free information card

Dept. of Roads

Neb. weed control plan works well

Richard W. Gray Jr., agronomist for the Nebraska Department of Roads, reported on the "largest" single weed control program in Nebraska at the 1976 North Central Weed Control Conference Dec. 7-9.

Weed scientists from 14 states and three Canadian provinces participated in the conference.

Gray stated that the Nebraska Department of Roads controls noxious weeds such as musk thistle on the land adjacent to 10,000 miles of roads comprising some 180,000 acres of right of way.

The department's right of way management policy has been effective in greatly reducing the time and money spent on the control of noxious weeds, Gray said. The program consists primarily of seeding to native and adapted grasses combined with a limited mowing policy.

When necessary, such a system is augmented by spraying contracts with some 78 of the 93 county weed control authorities. Most of the spraying utilizes the 2,4-D Amine and the more toxic chemicals are avoided, he said.

The seeding and limited mowing policy has been widely acclaimed by conservationists, bird lovers and wildlifers because of its effectiveness in providing undisturbed nesting and loafing cover for upland game birds. The department has received at least two awards from wildlife organizations for its efforts in this direction.

Though the department has made great progress in lowering weed control costs, every farmer, rancher and lawn owner is aware that it does cost real money. The department spends about 60¢ per acre annually or a total of $90,000 to $120,000.

Gray summarized the program as based on good turf maintenance, proper management, judicious use of chemicals and continuous cooperation with county weed control authorities and the department's thousands of "neighbors."


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Radiation may be key to better turfgrasses

Radiation treatment can be used to overcome genetic barriers to the future improvement of turfgrasses, according to Dr. Jerrel B. Powell, a research geneticist with USDA's Agricultural Research Service (ARS).

In tests conducted at ARS's Beltsville Agricultural Research Center, Beltsville, Md., Dr. Powell used gamma radiation to induce genetic mutations in commercial varieties of bermudagrasses.

"Bermudagrass hybrids are the mules of the grass world," Dr. Powell said. "They are sterile and can have no further offspring because of their particular chromosome makeup, resulting from their diverse and mixed parentage."

Mutation breeding is one way out of this genetic dead end. The technique involves exposing the root stems of bermudagrasses to gamma radiation. The radiation treatment causes the chromosomes of the sterile grasses to break up, and the genetic material to be rearranged, producing combinations that would be rare in nature.

"Radiation speeds up the mutagenic process. Within a single year you can obtain many hundreds of mutations rather than the one or two that you might get from an untreated natural populations," Dr. Powell said.

From these mutants, those grasses showing desirable traits such as dwarfism, deep green color, or winter hardiness, can be selected for development as a new variety. Because the bermudagrasses are sterile, it would be impossible to bring out these traits with conventional breeding.

Bermudagrasses make good sod. They can be mowed close and can withstand heavy wear. They are relatively resistant to diseases, insects, drought and high temperatures. Because of these many desirable traits, bermudagrasses are widely used on golf courses, athletic fields, lawns, and highway rights-of-way throughout the southern region of the United States.

Mutation breeding technology has already been used by European researchers to develop new varieties of potatoes, ornamentals, fruits and cereals. With the exception of sugarcane, however, it has not yet been extensively applied to grasses such as bermudagrasses which reproduce form sprigs or sod.

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Capillary watering economical for container stock irrigation

Capillary watering, commonly used in Europe, and now becoming popular with florists in this country is a method of crop irrigation which offers the nurseryman an easy, economical way of irrigating container stock.

Expenses are lowered because a smaller initial investment is required to establish the system vs. other methods and considerably less water is needed. Furthermore, subirrigation lowers the incidence of foliar diseases thus less spraying is required.

The procedure requires a level bench or ground bed, a layer of poly film placed over the bench or bed and a capillary mat on the poly along with a means of irrigating the mat.

The bench or ground bed must be level to support the mat evenly to prevent puddling.

Plywood, snow fence, close spaced slatted bench material, or fairly compact gravel can serve as a base.

Polyethylene of any color and thickness is placed over the base to serve to retain the water and permit it to spread sideways under the mat. The capillary mat is located over the poly and plants placed on the mat.

Mats are kept moist with irrigation through spaghetti tubes or more commonly Chapin's twin-wall or DuPont's Via-Flo tubing. Since it is necessary to keep the mat at or near saturation, the water can be allowed to run all day or put on a time clock operating a solenoid valve. Typically no more than 5-6 pounds pressure is needed with Via-Flo or Twin wall tubing.

At Ohio State University a study was initiated in the container nursery to evaluate the growth of Royal Beauty Cotoneaster produced in 2 container types, 2 container sizes, on several capillary mats on a bench and ground bed.

The plants were potted and placed outside on the mats April 23, and evaluated for vegetative growth Oct. 8, 1976. The growing media was Metro Mix 300 fertilized with Osmocote 18-6-12. One-half of the plants were grown on an expanded wire, 18" raised bench 48' long by 4' wide covered with clear poly.

The remaining plants were placed on a 3-inch gravel ground bed of similar dimensions leveled and covered with clear poly. The mats evaluated on the bench were: Water-Mat (Pellon Corp.), Vattex-P (U.S. Vattex), Simtrac No. 202 (Simtrac, Inc.) Jednak Thick (not commercially available), Weedchek (Certain-Teed) and Eddymat (F. R. Young Co.) All of the mats except Simtrac and Jednak Thick were evaluated on the gravel bed.

The mats were kept moist via Via-Flo tubing with 2 lines per 4' wide bench or bed operated at 4 to 6 hours per day from a time clock. However, this did not supply all the water needs and plants were watered on an average of once a week from overhead.

The cans were Zarntainer No. 300 (1 gal.) and No. 800 (2 gal.) with holes along the base and one in the underside. Also used were Polytainer No. 1 (1 gal.) and No. 2 (2 gal.) with holes only along the base. Ten 1-gal. Cotoneaster dammeri 'Royal Beauty' and 6 2-gal. cans per container type and size were placed on each mat on both the bench and gravel bed.

Royal Beauty Cotoneaster was selected because it is a rapid growing plant with a greater water requirement than many other plants. Liners from 1975 summer cuttings were placed in all containers. All plants were irrigated thoroughly from above at the time of placement to initiate capillary action throughout the media and mat.

In summary, capillary mats can be satisfactorily used as an aid in the production of container grown Royal Beauty Cotoneaster. The mats were kept moist for 4-6 hours per day (4 hours when the plants were smallest) utilizing time clock controlled Via Flo tubing together with approximately weekly supplemental overhead irrigation.