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Spring 2006

Contents

Back Ground Information on Dr. Trout

WSSA information

Shop News

Welcome to
Dr. Thomas Trout
New Research Leader
Water Management Research
Fort Collins, Colorado

Created by Dottie Depperschmidt

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Dr. Trout received his B.S. in Mechanical Engineering from Case Western Reserve University and his M.S. and PhD in Agricultural Engineering from Colorado State University. After three years working on international technical assistance programs with US AID and the World Bank, Dr. Trout joined the ARS Northwest Irrigation and Soils Research Center in Kimberly Idaho. During 13 years in Idaho, Dr. Trout developed and promoted automated surface irrigation systems (cablegation), quantified the effects of soil management on infiltration and the impacts of infiltration variability on surface irrigation efficiency and management, and described the mechanisms that cause soil erosion under surface irrigation. In 1995, Dr. Trout became the Research Leader of the Water Management Research Unit at Fresno/Parlier, California.

At the California WMR Unit, he worked on irrigation management practices for horticultural crops including peaches, strawberries, lettuce, and peppers. Dr. Trout, along with other Unit scientists, used weighing lysimeters, precision micro-irrigation systems, and infrared photography to develop crop coefficients based on canopy size that apply over a wide range of cultural practices.

He also worked closely with the strawberry industry to evaluate their drip irrigation systems and develop improved irrigation design and management practices.

When Dr. Trout arrived in California in 1995. ARS and the California WMR Unit undertook a high priority program to find alternatives to soil fumigation with methyl bromide, which was being phased out under international treaty. He led an effective program that evaluated alternative fumigants, developed safe and effective application methods, and demonstrated alternatives on grower fields. A success of the program was development and implementation of soil fumigant application through drip irrigation systems. This method is currently the primary alternative being used by the billion dollar strawberry industry in California. This effort, with Dr. Trout as team leader, has won several national awards including the White House Closing the Circle award, the USDA Secretary's Honor Award, the EPA Stratospheric Ozone Protection award, and the ARS Technology Transfer award.

Back

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Dr. Dale Shaner - Weed Physiologist

From Poster at the Weed Science Society of America, held in New York February 13-16,2006.

Field History And Dissipation Of Atrazine And Metolachlor In Colorado

Dale Shaner[1], and W. Brien Henry[2], [1] USDA-ARS WMR, Fort Collins, CO 80526; [2] USDA-ARS CGPRS, Akron, CO.

Field and laboratory studies were conducted to determine the rate of dissipation of atrazine and metolachlor in soil from Colorado.

The published half lives of atrazine and metolachlor are 60 days and 56 days, respectively.

Atrazine: In the field studies, the half-lives of atrazine ranged between 2.5-35 days. The shortest half life occurring in soils which had been treated with atrazine for at least 5 years. The longest half life was in a soil that had never received atrazine. The rapid dissipation of atrazine may result in reduced residual weed control.

Metolachlor: In the field studies, the half-lives of metolachlor ranged between 24-100 days. However, the half life even in fields that received multiple application of metolachlor was similar to published results.

There was no apparent relationship between the half-life of metolachlor and the half life of atrazine in soils that had had multiple applications of the herbicides.

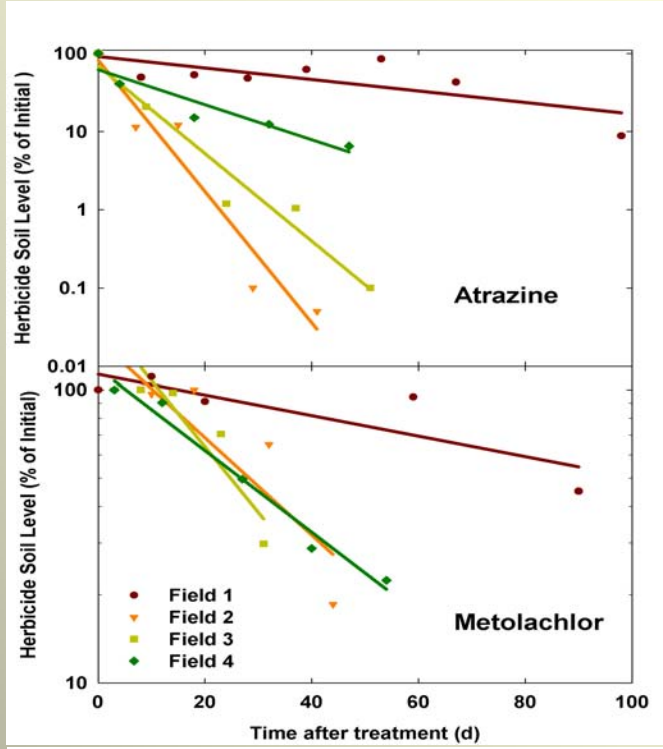

Figure 1. Dissipation of atrazine and metolachlor in 4 fields in Colorado. Field 1: Fort Collins; Fields 2-4: Yuma.

Soils ranged from sand to clay loam:
OM from 0.5-2%.In field studies, the herbicides were applied by the farmer at recommended use rates.

Field 1 - 1st yr corn after pasture

Field 2 - Continuous corn-Atrazine for 5 yr

Field 3 - Continuous corn-Atrazine for 5 yr

Field 4 - 2nd yr corn after pasture, Atrazine for 2 yr

Soil	Herbicide DT_{50} (days)	
	Atrazine	Metolachlor
Field 1	35.6	100
Field 2	2.5	28.3
Field 3	2.4	24.8
Field 4	4.1	26.7

Back

Rocky Ford Lysimeter

Dr. Gerald Buchleiter
Agricultural Engineer, WMR, ARS

In close cooperation with Colorado State University and the Colorado State Engineer's Office, a large lysimeter is in the final phase of construction in the ARS shop. This specialized piece of research equipment will be installed at Rocky Ford, CO and used to carefully measure evapotranspiration or crop water use. The impetus for this project is the result of a U.S. Supreme Court decision on a long running legal dispute between Kansas and Colorado over the Arkansas River Compact. Accurate data are necessary not only for satisfying this legal issue but also for more accurate determination of crop water use in future water transfer proceedings.

Installing the lysimeter in the field is a daunting task. The lysimeter consists of two boxes constructed of 3/8 in. thick steel. The outer box (14 ft L x 14 ft W x 8 ft H) rests on a well supported concrete slab in the bottom of a 12 ft deep pit. This provides an underground chamber for the scale and data collection equipment that continuously weighs the inner tank (10 ft L x 10 ft W x 8 ft H) which contains an undisturbed soil monolith weighing approximately 40 tons. The scale weighing the inner box is capable of measuring weight changes of .002 inches of water.

Various crops starting with alfalfa, will be planted in the soil monolith of the inner box as well as the surrounding field. All of the components of a water budget can be determined very accurately on a daily basis. Research on water use of various crops using this lysimeter will be ongoing for at least 15 to 20 years.

Back