

On-Farm Irrigation

PUBLICATION

Drip Irrigation for Row Crops

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About this publication:

Drip Irrigation for Row Crops is the fifth in a series of water management handbooks prepared by the University of California Irrigation Program to help water managers address a wide range of practical irrigation matters. This handbook covers annual crops, while another handbook in the series, Micro-irrigation of Trees and Vines, covers permanent crops. Funding for the book was provided by the California Energy Commission and the U.S. Department of Agriculture Water Quality Initiative.

Other titles in this publication series include: Agricultural Salinity and Drainage; Surge Irrigation; and Irrigation Pumping Plants.

Ordering Information appears on the bottom of this page.

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Introduction:

More and more growers in California are using drip irrigation on row crops. Drip irrigation -- applying small amounts of water slowly and frequently through emitters spaced along polyethylene tape or tubing -- is now the main method used in California to irrigate strawberries. Many lettuce, cauliflower, broccoli, celery, and tomato growers are also converting to drip irrigation.

The reasons for the growing popularity of drip irrigation are several. Drip irrigation offers improved yields, requires less water, decreases the cost of tillage, and reduces the amount of fertilizer and other chemicals to be applied to the crop. Because drip irrigation makes it possible to place water precisely where it is needed and to apply it with a high degree of uniformity, it lessens

both surface runoff -- excess water running off the lower end of the field -- and deep percolation -- water flowing down through the soil past the root zone where cannot be used by the crop. Drip irrigation can also be used in conditions unsuitable for other irrigation methods -- on steep and undulating slopes, in very sandy soils, and in fields with widely varying soils.

These features make drip irrigation potentially much more efficient than other irrigation methods, which can translate to a significant water savings. But drip irrigation can only achieve this level of high efficiency if the system is carefully designed and managed so as to prevent such problems as emitter clogging and differences in emitter flow rates stemming from pressure variations in the irrigation system or from differences in emitters and flow passages originating in the manufacturing process.

This handbook is intended to serve as a practical guide to designing and managing a drip system for irrigating row crops and to addressing the unique problems associated with

drip irrigation. It discusses patterns of root development, soil water content, and soil salinity under drip irrigation; how to apply water uniformly; how to determine how much water is being applied, how often to irrigate, and how long each irrigation should be; how to inject chemicals and fertilizers through a drip system; and how to prevent clogging from chemical precipitates, organic matter, and roots.

Questions or comments:

The information presented here is grounded both in technical literature, and in the authors' field experience.

Comments or questions about the handbook or about drip irrigation in general can be directed to Blaine Hanson, UC Irrigation and Drainage Specialist, Department of Land, Air and Water Resources, UC Davis, Davis California 95616, (530) 752-1130; Larry Schwankl, UC Irrigation Specialist, Department of Land, Air and Water Resources, UC Davis, Davis, California 95616, (530) 752-1130; Stephen R. Grattan, UC Plant-Water Relations Specialist, Department of Land, Air and Water Resources, UC Davis, Davis California 95616 (530) 752-1120; or Terry Prichard, UC Water Management Specialist, 410 S. Wilson Way, Stockton, California 95205, (209)944-3711.

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ORDERING INFORMATION:

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