Extension
Circular 326

April 1962

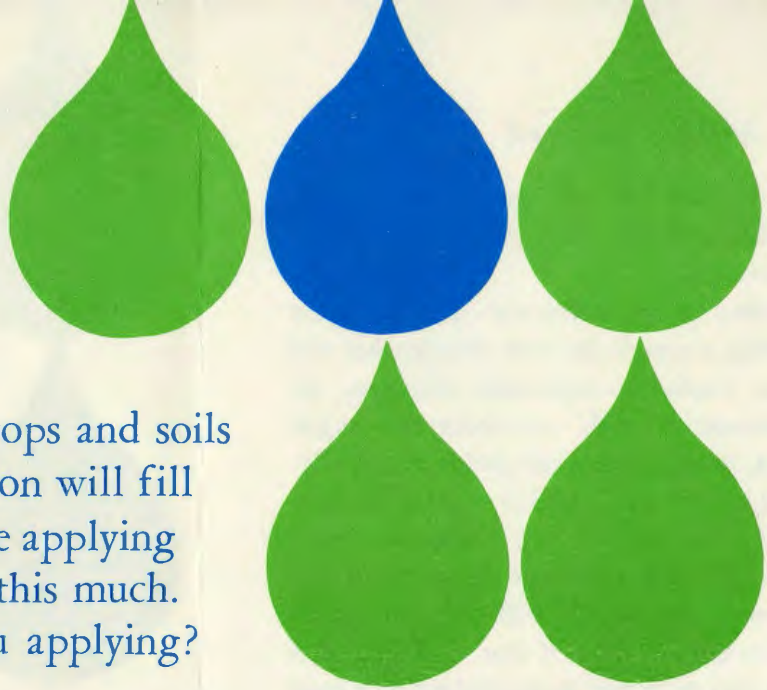
Extension Service

Institute of
Agricultural Sciences

Washington
State University

Pullman, Washington

HOW MUCH WATER?



With most crops and soils
a 2 to 4 inch irrigation will fill
the soil. Many farmers are applying
two to three times this much.
How much are you applying?

APPLY all the water the soil will hold—and *no more.* Applying too much water raises the water table and leaches plant nutrients—especially nitrogen. Here's how to figure out how much water you are applying at each irrigation:

$$\frac{\textit{cubic feet per second flowing X hours}}{\textit{acres}} = \textit{acre inches (per acre)}$$

$$\textit{Example:}\quad \frac{\textit{2 cfs X 12 hours}}{\textit{4 acres}} = \textit{6 acre inches (per acre)}$$

This formula can be used for either surface or sprinkler irrigation. If the flow is rated in gallons per minute, convert it to cubic feet per second (450 gallons per minute = 1 cfs). Or, for sprinkler irrigation only, use the following formula:

$$\frac{\textit{gallons per minute per sprinkler X 96.3 X hours}}{\textit{feet between sprinklers X feet between laterals}} = \textit{acre inches (per acre)}$$

$$\textit{Example:}\quad \frac{\textit{8 gals. per min. X 96.3 X 12 hours}}{\textit{40 feet X 60 feet}} = \textit{3.8 acre inches (per acre)}$$

For most soils and crops a 2 to 4 inch irrigation will fill the soil. The exact amount to apply depends mainly upon the water-holding capacity of your soil. The amount of water that has been used since the last irrigation, the amount of runoff water, and how evenly the water is distributed should also be considered.

How Much Water?

Apply only the amount crops will use and soils will hold. This cuts down on cost and prevents—

- *Leached plant nutrients:* Excess water passing through the root area leaches out plant nutrients—especially nitrogen. In experiments with over-irrigated sugar beets, leaching reduced yields drastically. This caused losses of $20 to $130 an acre.
- *High water tables:* On average-textured soil each inch of water in excess of the amount the plants will use raises the water table 1 foot if not drained. If 3 acre feet of water were applied to a crop of field beans and no drainage provided, the water table could rise about 20 feet in one year. High water tables may limit rooting depth, create alkaline and saline soil conditions, make the use of machinery impossible, and encourage weed growth.

So it's important to apply only as much water as the crop will use and the soil will hold.

For information on the water-holding capacities of different kinds of soils and how fast crops use water, contact the WSU Extension Agent in your county.

This circular was prepared by Mel Hagood, Extension Irrigation and Water Use Specialist, Washington State University.

Published and distributed in furtherance of the Acts of May 8 and June 30, 1914, by the Washington State University Extension Service, C. A. Svinth, Director, and the U.S. Department of Agriculture, cooperating. 5m462