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A COMPARISON OF WATER APPLICATION EFFICIENCIES OBTAINED UNDER VARIOUS METHODS OF APPLYING IRRIGATION WATER

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Water application efficiencies are needed in the design and operation of agricultural irrigation systems. Much of the water delivered to the farm for irrigation is lost while applying it to the land because of the method or system management practices followed. Measured losses have ranged from 15 to 82% of the water delivered to the field.

Water application efficiency studies have been conducted at several locations in the United States. Similar procedures were used in many of these studies. The amount of water delivered to a field and the runoff from the same area were measured for each irrigation. The amount of water stored in the crop root zone of the soil for each irrigation was determined by soil sampling before and after the water was applied. The field water application efficiency was calculated from the data gathered.

A study conducted near Boise, Idaho compared the field water application efficiency of the furrow, border, contour border and sprinkler methods of irrigation on alfalfa and hard fescue grass crop grown on three to five percent slopes. The field water application efficiency on the downslope furrow method averaged 40%, the downslope border average 47%, the contour border 66%, and the sprinkler method averaged 61%. These efficiencies are much higher than the 19 to 33% values normally attained by farm operators in the area.

Maximum water application efficiency requires water control equipment, proper land preparation, correct irrigation system design, and proper management of the irrigation system. With all other factors favorable, these practices should result in maximum production of a quality crop.

Note

1. Contribution from the Northwest Branch, Soil and Water Conservation Research Division, Agricultural Research Service, USDA, in cooperation with the Idaho Agricultural Research Experiment Station.