Instrument News . . .

Better Sprinkling on Small Research Plots

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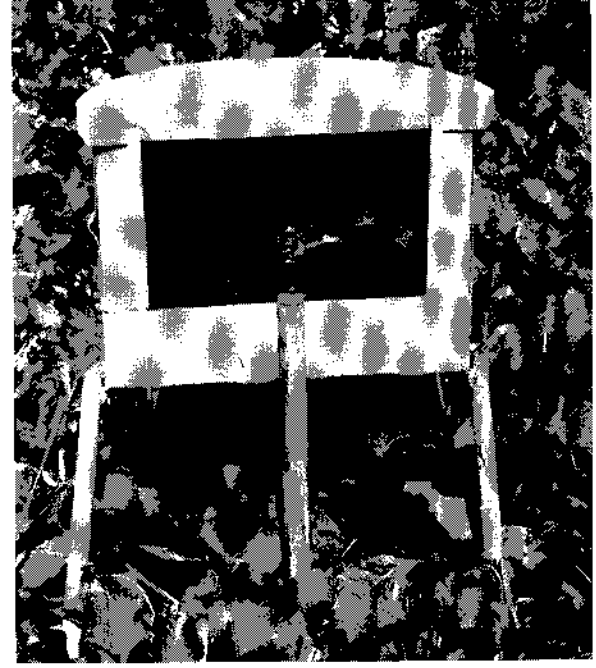


Fig. 3 The half-circle sprinkler shield in operation

BECAUSE of certain inherent advantages in sprinkler irrigation, interest in sprinkler irrigation research is increasing. However, problems arise in sprinkling small plots at low application rates. Because a representative portion of the overlapping sprinkler patterns must be used for the sprinkled plots, large border areas are needed with full-circle sprinklers. Part-circle sprinklers reduce border areas, but double or quadruple water application rates when set on half- or quarter-circle, respectively.

This sprinkler collection shield permits a full-circle sprinkler to operate normally but protects the area outside the plot from the excess spray. The spray that would fall outside the plot is trapped in the shield and drained to the supply sump or a disposal area. The shield was patterned after the sprinkler evaluation device designed by Tovey.*

Two shield designs were built — half-circle and quarter-circle. The half-circle shield is used along the edge of a plot; the quarter-circle shield is used at plot corners. The outer shell (Fig. 1) is made from a 30-gal steel drum.

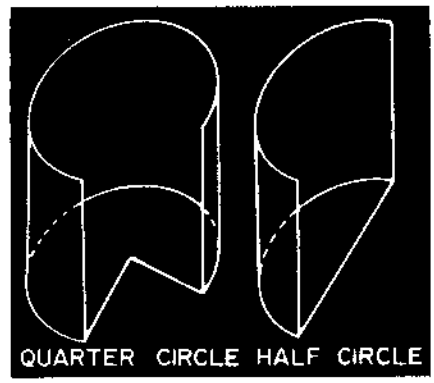
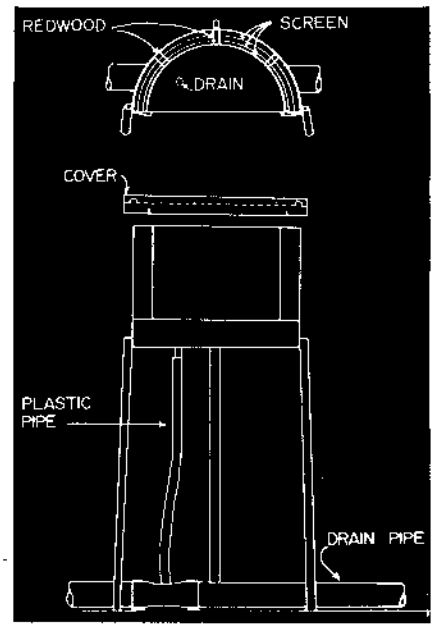


Fig. 1 Two quarter-circle shields or four half-circle shields can be made from one drum • Fig. 2 *(below)* Schematic of the half-circle sprinkler shield



Three layers of screen (Fig. 2) separated by narrow ¼ in. redwood laths are inside the shell. Aluminum shade screen forms the layer nearest the shell — this screen could be replaced by 40-mesh screen. The other two layers are 16-mesh copper screen. A piece of ¾ in. marine plywood is grooved to provide a top for the shield. A piece of rubber tubing is wedged between the last screen and the metal shell to prevent water from leaking between the wooden cover and the upper edge of the outer shell. A metal baffle is welded to the front of the shield and bent to cut the spray coming from the sprinkler nozzle. This design virtually eliminates splatter.

Half-inch pipe is used for the legs. These are bent forward to straddle the irrigation pipe. The water from the shield drains by gravity down a plastic pipe into 3-in. irrigation tubing joined with butyl rubber tubing. The aluminum pipe drains to a waste ditch at the lower end of the plots.

These shields were very successful when used with a solid-set sprinkler system on 20 ft by 60 ft plots during the growing season. They were also used to apply water to a randomized dryland plot layout with different moisture treatments (Fig. 3). Here 5-deg nozzles were used on 20-ft wide plots; 20-deg nozzles were used on 30-ft plots.

The sprinkler shield permits applying water at normal sprinkler rates without large border area between treatments. This saves both land in the experimental area and water when that is returned to the supply. The shields have been used with a fully automated solid-set sprinkler system with good success. • •

*Tovey, R. A. portable irrigation sprinkler evaluation device. AGRICULTURAL ENGINEERING 44: 672-3, 1963.

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