

Introduction

This bulletin describes techniques for measuring operating pressures, water application rates and uniformity during field evaluations of solid set or portable sprinkler irrigation systems. These irrigation systems typically use groups of impact or gear-driven sprinklers which operate at the same time to sprinkle water onto the soil or crop canopy. Sprinkler spacings are relatively close so that overlap between them increases the uniformity of water application.

The techniques presented do not apply to self-propelled irrigation systems such as center pivot, linear move, or traveling gun systems. Nor do they address single sprinkler systems such as large guns or small individual lawn sprinklers. The unique geometries of self-propelled and individual sprinkler systems require other procedures to measure application rates and uniformities of water application.

Solid set sprinkler irrigation systems are those in which sprinklers, with their associated riser, lateral, and manifold pipes, are placed in a regular pattern over the entire irrigated area. All of the sprinklers may be operated at once, or the crop may be irrigated in zones by operating only a portion of the sprinkler laterals at a time.

Solid set sprinkler systems may be permanent, in which case laterals and manifolds are typically constructed of buried PVC plastic pipe. This is common in many Florida citrus, nursery, strawberry, and ornamental fern production systems and in lawn and landscape irrigation systems. Alternatively, solid set sprinklers may be set in place only during a crop growing season. Sprinklers are then typically mounted on risers above portable aluminum pipelines which are placed on the surface. Laterals may be fed by either portable (typically aluminum) manifolds placed on the soil surface or permanent (typically PVC) buried manifolds. These systems are common for many Florida vegetable, tobacco, and turf crops.

In portable set sprinkler irrigation systems, the sprinklers and associated pipelines are temporarily set up and operated for each irrigated zone. They are then moved to a new zone for another irrigation. These systems are used to irrigate several zones; thus, they are designed so that all zones can be irrigated before the first zone needs to be re-irrigated. Because these systems are portable, less pipe and fewer sprinklers must be purchased as compared to solid set systems. However, labor requirements are normally much greater than for solid set systems. The specific system used normally depends on the relative availability of capital versus labor.

Both the solid and portable set sprinkler systems described here use sprinklers that are regularly spaced, typically in square, rectangular, or triangular patterns. The individual sprinkler spacings and