

irrigated, thus they do not need to be moved between irrigations.

The entire production area under a semi-permanent solid set system is not necessarily irrigated at once. In many cases, valves are used to control flow to individual laterals or zones. In other cases, such as when required for freeze protection, the entire field may be irrigated at once. In both cases, labor costs for system operation are low, because irrigations are controlled simply by opening and closing valves rather than by moving pipe.

Solid set, semi-permanent systems typically consist of sprinklers mounted on portable aluminum pipe. Because the entire production area is simultaneously covered with pipe and sprinklers, the initial system cost is much greater than the cost of a portable sprinkler system. Field traffic problems may also exist because the pipe remains in place on the soil surface during the irrigation season. In Florida, these irrigation systems are primarily used for vegetable and sod production.

### Permanent sprinkler irrigation systems

There are two types of permanent irrigation systems: solid set and self-propelled irrigation systems. Both types are commonly used in Florida.

#### Solid set irrigation systems

Permanent solid set irrigation systems are systems which consist of permanently placed pipes and sprinklers. In Florida, lateral, manifold, and mainline pipes are typically buried, and only the sprinklers and risers extend above the ground surface (Fig. 6). Because pipes and sprinklers are required to cover the entire production surface, permanent solid set systems are usually considerably more expensive than other types of irrigation systems. Therefore, permanent systems are typically



Figure 6. Pipelines are buried in permanent solid set sprinkler systems used for strawberry production.

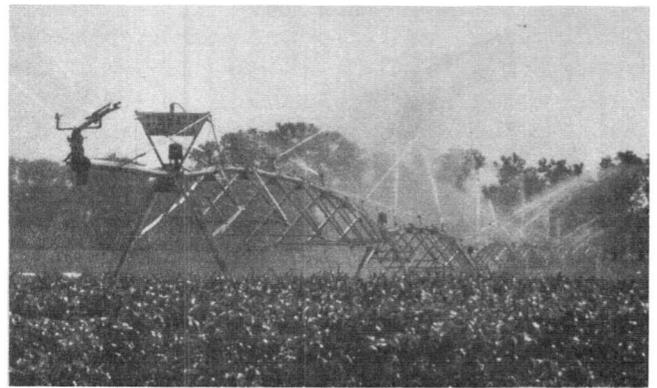


Figure 7. Center pivot irrigation laterals are supported by large A-frames with drive wheels for self-propelled operation.

used only on high cash value crops including citrus, strawberries, ornamental ferns and other nursery crops.

As with semi-permanent solid set systems, the entire production area under a permanent solid set system is not necessarily irrigated at once. Valves are often used to control flow to individual zones. However, when required for freeze protection, plant establishment, or crop cooling, the entire field may be irrigated at once. In both cases, labor costs for system operation are low because water delivery to a zone is controlled by simply opening and closing valves rather than by moving pipe.

#### Self-propelled sprinkler irrigation systems

Self-propelled irrigation systems are those which operate under their own power. During irrigation, they move slowly and continuously across the field as it is being irrigated. There are two types of self-propelled multiple sprinkler irrigation systems which are being manufactured: center pivot and lateral-move systems.

**Center pivot irrigation systems.** These systems consist of sprinklers which are mounted on a lateral pipe which is supported approximately 10-12 ft above the ground by large A-frames (Fig. 7). The lateral is fixed to a pivot point at one end. Water is supplied at the pivot point. In most systems, the lateral rotates around the pivot point and irrigates a circular or part-circle area in the center of a square block of land (Fig. 8).

Most center pivot systems are equipped with a large diameter end gun. The end gun operation is normally limited to a 180-degree arc, and its application is directed to areas beyond the lateral pipe-