

# Get Uniform Watering With a Boom Irrigator

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**O**ne key to successful plug and cell pack production is uniform watering. This cannot be achieved with hand watering or conventional overhead irrigation using nozzles with a pattern. Advances in boom irrigation technology give the grower a production tool that can be applied to existing greenhouses or new construction.

A boom system consists of one or more pipes containing nozzles that apply water as the system moves over the plants. It may be suspended from an overhead rail system or from a cart that moves down the aisle. Water is supplied by a trailing hose and powered by a battery pack or electric supply cable.

The simplest systems are grower built. The first one in Connecticut was built by a tobacco grower producing seedlings in cell trays. It used a lawnmower frame with a folding, double boom supported above the plants. The cart was guided down the center aisle by an arm riding on a pipe attached to the floor.

Power to move the cart was an electric winch mounted on the cart. In operation, the winch cable was unwound and attached to a hook at the opposite endwall. When activated, the winch pulled the cart at an even speed from one end of the greenhouse to the other. A microswitch stopped the cart when it reached the far end.

One advantage was that the cart could be easily moved between greenhouses. With the double boom, the first set of nozzles wet the surface with about 1/3 the required water, and the second set with larger nozzles provide a heavier application.

Hand pulled boom systems have been developed by several growers. These consist of a boom supported by a frame and a trailing hose. These can be mounted to an overhead conveyor track system or supported on the ground with bicycle wheels. Although operation is not as uniform as with a power unit, the savings in time and the more uniform watering offer some advantages.

The least expensive commercial units cost about \$2500. They can be adapted to most free-standing and gutter-connected

greenhouses, Boom widths to 70' are available. Bench or bed lengths to 400' can be watered with one setting. Some systems allow the boom to be moved from one bay or one greenhouse to another.

The commercial systems depend on a single or double rail attached to the greenhouse frame to support and guide the boom over the plants. Although most systems weigh less than 200 lb, adequate support must be provided for the system and the trailing hose.

A fixed or variable speed gearmotor is commonly used to power the boom. Manufacturers use fractional horsepower DC motors to allow varying speed of travel. Speeds of 25 to 250 feet per minute are available allowing a thorough watering or a light mist.

Stainless steel fan or cone spray nozzles are used to give good coverage. Usually these are spaced to provide an overlap of the pattern to give uniform application. Height of the nozzles above the plants is a critical dimension to provide that overlap. Additional nozzles may be placed at the ends of the boom to provide extra water for plants near the sidewall or aisles.

As with any automatic watering system, an adequate water supply is necessary. The wide selection of nozzle capacities available allows booms to be designed to fit most water supplies.

Generally a 12" to 15" spacing is used with a nozzle capacity of from 0.1 to 0.8 gpm.

Some systems will operate on water pressure as low as 15 psi but generally 40 to 50 is desired to give good uniformity. Clean water, free of particulate matter is essential to prevent clogging of the nozzles. One or more filters with a 150 to 200 mesh should be placed in the supply line.

Some systems are available with more than one boom. These can be fitted with nozzles with different application rates for misting, feeding, pest control or growth regulator application.

Several methods are available to control a boom system. The simplest use a time clock or cycle timer that activates the drive unit at predetermined times. More flexible systems use programmable controllers or microcomputers that allow speed changes, skipping of empty bench area, selection of boom section to activate and multiple passes over the same area. Safety and reliability are addressed in a number of ways. A variety of sensors may be employed to detect boom obstructions, mechanical problems, low water pressure or power failure. A voice alarm is used to warn of impending start-up.

In addition to the greater uniformity of water application, there are other advantages to a boom system. Less water is

needed because the system can be operated to provide the optimum amount of water for the crop. Less labor is needed because the water is applied automatically. Increased growing space can result as less aisle space is needed for watering.

Because of the large number of options, careful selection is required. Factors affecting selection include type and style of greenhouses, cropping system, water quantity and quality and amount of automation desired. Growers should shop around to find a system that is most economical for their growing needs.