

automation

# Boom Systems:

## A Solution for Efficient Irrigation



Boom systems' precise water delivery allows for greater crop uniformity and reduced water runoff.

Amid mounting water regulations and a persistent drought in parts of the country, some growers are exploring automatic irrigation, particularly in the form of the boom system.

**By Martin Schulz**

**T**oday, in many parts of the United States, these are indeed "the times that try growers' souls." Whether faced with restricted access to water, increasingly tight regulations or other water quality issues, the effective management of this precious resource is no longer an option.

Staying afloat in the drought-weary South and other "water-challenged" parts of the nation takes every bit of ingenuity that growers can muster. Hand watering is less and less an option, not only because of its inefficiency but also as a consequence of the tightening labor market. More than ever, growers are finding that automating their irrigation process not only addresses these problems but puts money in their pockets at the end of the day. For flexibility and financial payback, the automated watering boom system can be the ideal answer. The boom system's hallmark is its ability to apply exactly the water needed in a timely and uniform fashion.

### A Precise Choice

Whether rooting cuttings, watering plug trays, cell packs, flats of square containers, or for any other application where there is containerized plant material with little or no air space between, booms are unequaled. The rate of application can "grow" with the crop, from dose feeding of young plants using nozzles that apply a subtle mist, to heavy watering with larger droplet size as crops finish prior to shipping. For EC control, booms can apply water to just past the leach point when cultural requirements dictate. This ability to deliver water precisely and evenly results in greater crop uniformity, less crop loss and increased marketability, reduced water runoff and the ability to cut down the number and/or width of aisles needed for access when hand watering.

For greenhouses where water flow is restricted, booms are an excellent choice. In a typical 30-inch-wide greenhouse, they can operate on as little as 1.65 gallons per minute (GPM) — less than half what a garden hose uses! They also can be programmed to water before, during or after the work day. This not only avoids water flow issues but

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Spray bars on boom irrigation systems can span the entire width of the greenhouse.

delivers the right amount of water when needed while freeing workers to perform other tasks.

### Let's Get Technical

The heart of the boom system is the spray bar, typically a 1-inch pipe that delivers water to nozzles attached along its length. The spray bar usually spans the entire width of the greenhouse, from column post to column post in gutter-connected ranges or sidewall to sidewall in freestanding structures. It can irrigate

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the entire width or just portions to match the bench layout or aisle configuration. Water can be applied just to the areas that need irrigation.

A well-designed boom system can combat the edge drying that is typical along aisles by doubling up nozzles above the edges of the growing area. Nozzles also can be mounted on swivels at the ends of spray bars, directing water outward to reach plant material not directly below the bar. This is especially useful on plants adjacent to column posts or along sidewalls. For even

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Booms can be remote started, programmed or monitored by PC, in addition to direct controls. They can be operated from a Sensaphone or Blackberry, in some cases.

greater control, turret nozzles allow a grower to dial in any of three different flow rates, from mist to medium to heavy watering.

### Three Tools

Flow rates are one of three key tools that help a boom system deliver precise amounts of water to a crop. A second tool is the ability to adjust the travel speed of the boom. Typical speeds range from zero to 70 feet per minute. A boom can pass over slowly to drench a crop, or more quickly with misting to keep cuttings from desiccating.

The third method to control water application is the ability to program multiple round trips per irrigation cycle. In combination, these three methods of delivering water enable crops to receive exactly the proper amount of water and

fertilizer at each stage of development, under varying environmental conditions.

### Boom Basics

Boom water flow requirements are a function of the number of nozzles, their GPM output and the inner diameter of the spray bar. Typical spacing is 14 inches. Outputs range from 0.067 GPM for plug trays or rooting cuttings, to 0.8 GPM for watering cell packs, flats of square containers or potted crops. The standard pipe is 1 inch in diameter, and nozzle outputs are based on 40-psi operating pressures.

The amount of square footage a boom can irrigate efficiently depends on the daily moisture requirement of the crop, along with environmental factors that affect crop moisture needs.

Typically, the range is anywhere from 10,000 to 20,000 square feet per boom. For large areas, a transfer system can be used to shift the boom from bay to bay or house to house. This transfer typically takes place along the end wall, and requires several feet of space to allow a worker to move the boom to the next bay via an overhead rail. Outside transfer systems also are available to move booms from Quonset to Quonset. They are a good way to maximize the return on investment in the system.

### Understanding the Advantages

The ability to easily and quickly program different irrigation schedules allows the system to adapt easily to changing weather patterns or types and arrangements of plant material.

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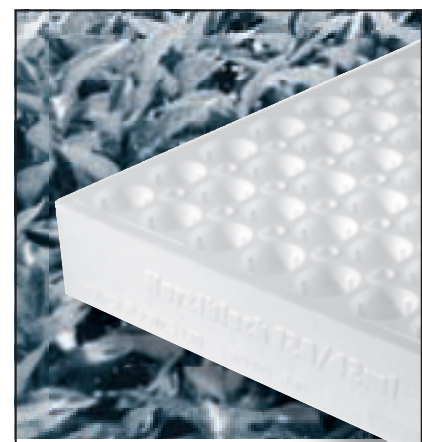


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Investing in a boom system can "pay for itself" in its benefits, often in less than a year.

The range of control features now available runs from simple to sophisticated. The basic system will allow for variable speeds, multiple passes and ability to control the interval of time between irrigation cycles.

More sophisticated controls make it possible to start the irrigator at a particular time of day or week. Multiple watering programs are possible, each with its own start and stop time, travel speeds, multiple passes and repeat time intervals. Booms can be remote-started, programmed or monitored via PCs using interface software. They also can be controlled based upon decisions made by growers' environmental computers or on prompts from other external devices that measure such factors such as solar load or soil moisture content.

In choosing a boom system, there are a number of safety features to look for, so you can sleep well knowing the machine is operating properly. These include automatic shut-off in the event of a collision with an obstacle, low water pressure or loss of power, and the ability to sound alarms in the greenhouse or remotely via Sensaphone, even to your BlackBerry.

Used properly, a boom system can apply water, as well as fertilizers, fungicides and other chemicals, far more efficiently than a fixed sprinkler system or manual sprayers. An investment in a boom system can pay for itself in a fairly short time — often a year or less — through savings in labor, water and fertilizer use. Among their advantages:

- More efficient use of water, fertilizer and chemical applications compared to hand watering or fixed sprinkler systems.
- Consistent uniformity and timeliness of application for more consistent quality and less crop loss.
- Enhanced rooting and germination as well as stronger growth of plugs (small cell plugs really benefit)

- The ability to reduce or eliminate access aisles needed for hand watering, which increases effective growing area. Boom systems have also been adapted for outdoor crop production areas.

In recent years, growers have discovered a variety of innovative uses that extend the value of their boom systems even further. Here are just a few examples:

- Shipping carts suspended from the system's overhead support rails glide easily through the house, loaded with product to set out or pulled for shipping
- Fitting of booms with incandescent or sodium-halide lighting for photoperiodic control (day/night cycles) or to satisfy certain cultivar requirements for more lumens at night
- Mounting of fertilizer injectors or hydraulic sprayers for more even and consistent chemical application

### Taking Responsibility

With increasing concerns about water availability, proper water use, runoff containment and/or treatment of runoff, the ability to minimize wasted water is crucial not only to avoid pending regulation and possible fines, but to promote our industry's reputation as responsible users of this precious resource. No automated system does this better than a watering boom system that is controlled by a measuring system that adjusts watering to plant physiology rather than when a clock says it's time. **GPN**

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