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By: [David Kuack](#) | [Email](#)

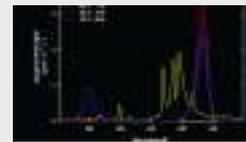
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As Seville Farms in Mansfield, Texas, expands its production to include more annuals, young plant producer Integrated Botanics has benefited from the increase. An increasing percentage of the finished plants that Seville Farms produces began as starter plants at Integrated Botanics, also located in Mansfield. Ninety-

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five percent of the young plants produced by Integrated Botanics are sold to Seville Farms. The other 5 percent of Integrated Botanics' sales are through brokers.

“Increasing our outside sales has always been our goal,” says Integrated Botanics General Manager Rodney Elliott. “The limiting factor has been the production space available. Even during the summer we are maxed out of space. This has made it difficult to have any kind of availability and speculation for outside sales. Unless we receive a pre-booked order, it’s hard to speculate due to space restrictions.”

Eleven-year-old Integrated Botanics produces annuals and perennials, herbs, vegetables, vining plants, groundcovers and tropicals.

“Until this year, we produced primarily perennials,” Elliott says. “We have added some production space and taken on a lot more annuals, especially seed-propagated annuals. Right now we have just over an acre of production space. Last year, we produced close to 12 million inputs, including plugs and cuttings. We haven’t done anything with tissue culture yet. We’d like to look at that at some point, especially since we are starting to work with LEDs.”

Integrated Botanics Is Primed For Propagation

Elliott, who has been at Integrated Botanics for two years, says before he was hired, the company had a very basic production facility that was used to propagate groundcovers and perennials.

“I previously worked at Heimos Greenhouses in St. Louis, which did a lot of plant propagation,” Elliott says. “When I arrived at Integrated Botanics, the production facilities included stationary benches, mist lines with simple controllers and exterior shade cloth over the houses. We took an existing 1-acre Seville gutter-connected greenhouse and basically gutted and retrofitted it. We shortened the greenhouse from 200 to 150 feet long and installed fan-and-pad cooling. Other improvements included a Bouldin & Lawson flat filler,



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Cherry Creek boom irrigation, Rough Brothers rolling benches, Delta T fin tube heating, an Argus environmental control computer and two Svensson shade curtains inside the greenhouse. Along with the installation of the Philips LED lights, this setup is probably better than any I have previously worked with.”

LEDs Initiate Germination With Less Stretching

In addition to the improvements Integrated Botanics made to its production facilities, the company also added a germination room.

The design of the germination room, which came from Seville’s former corporate head grower Mark Clemens, consists of a room within a room.

“We took an old non-functioning cooler and installed it in the greenhouse headhouse,” Elliott says. “We built a metal building around the cooler. Environmental controls were installed inside the metal building, which enables us to maintain constant temperature and humidity levels within the cooler.”

Originally the germination room was equipped with six 4-foot fluorescent lamp fixtures. The fluorescent lights were replaced in December 2012 with 10 Philips GreenPower LED deep red/blue Production Modules. The germination room can hold 1,125 324-cell plug trays.

“The goal of using the LEDs is to initiate germination of seedlings with a side benefit of reducing stretch,” Elliott says. “The LEDs provide both red and blue light, which is a better wavelength spectrum, and they also provide more light than the fluorescents.

“The biggest advantage of the LEDs over the fluorescents is that they have very little heat output. With the fluorescent lights, they would raise the temperature in the germination room by 20°F just from the ballasts and bulbs. The LEDs only raised the temperature 5°F. It is much easier to control the temperature in the room with the LEDs. That was a big improvement.”



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Mixing Lighting With Irrigation

Integrated Botanics has also added LED Production Modules to one of the irrigation booms in its greenhouse.

“We first tried the LEDs on the boom for night interruption lighting on dahlias,” Elliott says. “I wired the LEDs into the boom on a solenoid switch so I could light the crop. LEDs are really directional so you can treat the light almost like water. There may be crops in the greenhouse that may not need light along with crops that do. Having the LEDs on the boom makes this is a very versatile setup. Prior to installing the LEDs on the boom, we were using incandescent bulbs in the greenhouses. The lights were set on a timer and were stationary, not on the boom.”

Elliott says when he started looking at alternatives to incandescent bulbs he considered using 400- and 600-watt high-pressure sodium lamps.

“Cost-wise, they were almost the same as the LEDs,” he says. “They produce more heat and pull a lot of amperage, too. Right now we have 12 LED Production Modules on one boom. We worked with Hort Americas to determine the number of modules to use on the boom. We are going to do some additional studies to see if we can reduce the number of modules needed for each boom. I don’t think that we will be able to go lower than six modules because the light given off by the LEDs is fairly directional. If reduced to fewer than six modules per boom, we wouldn’t get the coverage we needed.”

A Versatile Lighting Option

Elliott says using the LEDs on the boom is basically like a watering cycle.

“We trialed how many minute intervals between each pass along with the length of the house,” he says. “The speed of the boom has to be right, too. Right now, we are overcompensating and running the boom as slow as we can. This ensures that we deliver the maximum amount of moles of light on the plants for the night interruption cycle.



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“We haven’t tried the boom on every crop that we can try it on. There are certain crops that I know will benefit from the lights. We’re going to keep experimenting to see what crops the lights are effective on. We plan to use the lights on garden mums and asters.”

Elliott says all of the greenhouses will eventually be equipped with irrigation booms and LEDs.

“The other thing we are considering with the booms is adding another solenoid valve to allow us to light on each side of the aisle,” he says. “The way the booms are set up, we have an aisle in the middle of each house. Usually the way we stick cuttings is we fill up one side of a house and then go to the other side. It’s possible that we wouldn’t have the same crop on each side of the aisle. We could segregate it so only one side of the house is lighted at a time. We could also light one side longer than the other side. We can control the light however we want.”

Replacing Incandescent Bulbs

Elliott equipped one of the houses that Integrated Botanics received from Seville Farms with Philips GreenPower LED deep red/white flowering lamps. The LEDs, which are replacements for incandescent bulbs, can be used for photoperiod lighting.

“We wanted to try both the LED flowering lamps and the LED Production Modules,” Elliott says. “The spectrum of light of the LEDs is more precise than the incandescents. The light given off by the LED flowering lamps is not as directional as the LED Production Modules. We use our Argus environmental control computer to control the flowering lamps.”

Elliott used the LED flowering lamps primarily on annuals and hibiscus in the spring.

“Once we install booms in all of the houses, we’ll probably move the flowering lamps to another area. They are portable and easy to move. We can take them down and move them to another section if we need to. Or we



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may decide to leave one house with the flowering lamps.”

Elliott is also interested in learning what annuals the LEDs can have an effect on.

“Besides petunias, we haven’t determined yet if the LEDs hasten flowering of any of the other crops,” he says. “We know that petunias benefit from the additional light. Since we have just gotten into annual propagation, we are still learning. This was the first year we used the LED flowering lamps, so this fall and next spring we are definitely going to be looking for an effect.”

Integrated Botanics

Founded: By Billy Brentlinger in 2002 in Mansfield, Texas

Production area: 1 acre of environmentally controlled greenhouse space. The company is planning to expand with an additional acre of greenhouses.

Crops: Annuals, perennials, herbs, vegetables, vining plants, groundcovers and tropicals

Customers: Seville Farms and brokers

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