

GROWERTALKS

Features

7/30/2014

Inside the Greenhouse: The Height of the Issue

Al Sray



It's short. It's dark. It's almost claustrophobic.

No, it's not a deep cave filled with bats and stalactites in some far-off land. It's a greenhouse—and it's expected to grow quality plants!

Pictured: Dallas Johnson Greenhouses have 16 ft. of sidewall height on their Nexus Zephyr greenhouse range. It allows them to double stack baskets without affecting the plants below.

That may be a bit of an exaggeration, but we all have either walked into, or actually own, pre-90s built greenhouses. And one thing always seems to stand out—a very short sidewall/under-gutter height. That was just how it was done in those years. It was very common to see an 8-ft., or even a 6-ft., sidewall/under-gutter height.

The thought process was simple. It's not only cheaper to build shorter greenhouses, but it's also less space to heat. Continuing with that rationale, shorter also meant stronger. If you didn't plan on heating in the winter in Northern climates, and there would be no snow melt-off, then a shorter structure was less likely to collapse.

As we have come to learn, most of the assumptions were correct thinking at the time, but didn't prove to provide the best environment for what counted most ... the plants.

So what's the right height to build your growing greenhouse? You do, indeed, add more costs in both materials and operations the taller you go. But what's that ideal break-even point where paying for a better growing environment meets those initial capital costs and the return on your investment?

At Nexus Corporation, we highly recommend a minimum gutter height of 12 ft., but that's the minimum. There are a lot of advantages to going with a 14-ft. or even a 16-ft. tall sidewall height.

Because all of Nexus' structures are engineered to meet snow and wind loads, many of the old assumptions about shorter structures being better because they're stronger have been thrown out the window. You really can have the best of both worlds—the ideal growing environment, at an affordable cost, that will stand up to your local snow and wind load requirements.

Here are some of the key factors to consider when determining what gutter height you should build your new greenhouse.

Not all gutter heights are created equal!

You need to be careful when comparing gutter heights on different styles of greenhouses, as that number can be deceiving. For example, the gutter height of a Nexus Vail or Zephyr is the same as the under-truss height. This is an important point as it allows a lower gutter height to give you the under-truss clearance you need for hanging basket systems, booms, lights and other mechanical systems with certain styles.

Some greenhouse styles do have “energy”-style trusses. These styles have trusses with bottom chords that can extend to as much as 3 ft. below the gutter height. This means that a greenhouse with this style truss and a 14-ft. gutter/sidewall height would only have an 11-ft. under-truss height.

Comparing this scenario to the use of an energy truss to support greenhouse roof systems lowers the clearance height inside the greenhouse in relationship to the gutter height. These houses, like the Venlo styles, will need higher gutter heights than a Nexus-trussed structure to achieve the same inside clearances. Make sure you aren't paying for additional height when it won't be needed.

This under-truss height affects plants growing overhead. These taller heights allow you to hang overhead hanging basket systems, booms and other mechanical equipment below. In fact, many growers with tall greenhouses are now double, or even triple, stacking their hanging basket systems. Obviously, increasing the number of hanging baskets you're able to produce in the same square footage means a much better ROI on your new greenhouse facility.

Many large growers have even taken it a step further. They're building tall greenhouses and using them for dual purposes—they're both growing hanging baskets overhead and using the area below as headhouse/shipping facilities.

Another advantage of tall truss heights is when you're utilizing supplemental grow lights. Since most grow light systems hang from the bottom chord of the truss, those lights are further away from the plants. This not only keeps the quality of the light better and more uniform, but it also keeps the immense heat generated by the lights further away from the plants.

Lastly, no matter what style of greenhouse you have, there's always a certain amount of steel or aluminum roof structure overhead. This can create shadowing in parts of the greenhouse below. In a 14-ft. to 16-ft.-tall greenhouse, that roof structure is much further away from the plants. The light gets reflected much better and lessens those shadows and potential issues on the plants.

Ventilation

In a wide span greenhouse with a standard 6/12 greenhouse roof pitch, the taller your sidewall height, the better ventilation you'll get. For example, in a standard Nexus Vail, A-frame structure, a 14-ft. gutter height will give you a grade to peak height of more than 24 ft.

This height gives you a very large attic. Because hot air rises it allows for a much larger air mass and area for that hot air to go. If you're naturally ventilated, particularly using atrium-style open roof vents, that air will not only escape at the highest point in the house, but will actually be pulled out by the prevailing winds blowing over the top of the vents. This is a big difference when you compare the gutter heights of a traditional Venlo style house with the smaller peak heights. To get an equivalent peak height to release your heated air, you would need to be nearly 8 ft. taller with your gutter height. Again, not all gutter heights are the same.

If you're cooling mechanically with exhaust fans and evaporative cooling pads or swamp coolers, the same concept applies. That heat gets pulled away from the plants at either grade level or on the growing benches and goes into the large attic. The cooler air below coming from the mechanical cooling system then has a much better chance of being effective.

Door height

This seems like a minor issue, but have you ever tried to wheel an 8-ft. cart through a 7-ft. tall greenhouse door? What about trying to drive a tow motor or forklift through that same door?

Overhead doors (especially with automatic openers) offer the most convenient way to transport carts from one zone to another or from one zone to the headhouse for shipping. But, typically, those overhead doors need at least 18 in. of clearance overhead. So that means to have a 10-ft. tall door, you would need to have a minimum of 11.5-ft. of sidewall height.

Taller (and wider) doors give you more flexibility in your greenhouse operation. It makes for easier and faster transport. And as we all know, when May hits and every second counts in getting product shipped, a well-planned movement scheme with no door limitations can mean a lot.

Budget invariably plays a huge role in the decisions that are made when designing a new greenhouse. While all of the points above show that it's indeed ideal to build as tall a greenhouse as you can afford, every grower is different.

Where's that sweet spot between building the perfect plant-growing facility and being able to make that monthly loan payment? The answer is different for every grower. But at Nexus, our sales staff averages almost 20 years in the greenhouse structures design and sales experience. We use that experience to help you come up with the best possible solutions for your greenhouse needs. **GT**

Al Sray is Midwest Sales Manager for Nexus Corporation in Northglenn, Colorado..