

Hibiscus stem breakage

Tight spacing in greenhouses and abundant flower buds causes stem breakage of hibiscus. August 15, 2017 - Author: [W. Garrett Owen, Michigan State University Extension](#)

The goal of every greenhouse grower is to produce a high-quality crop that is compact, well branched and in flower. In some instances, greenhouse crops may not be considered “high quality,” most likely due to constraints such as space and time or sub-optimal environmental conditions. Consistently, these constraints are the most common challenges among growers.

On a recent greenhouse visit, I observed how space constraints diminished the quality of a perennial hibiscus crop. The hibiscus crop was grown in a greenhouse, pot-tight. Tight spacing inhibited plants from developing thick, sturdy branches that could support the large flower buds. Plants were tall, spindly and had few branches



The majority of the basal branches were broken from the main stem (Photo 2). Stem breakage was the result of plants being moved from a pot-tight greenhouse environment to an unprotected outdoor environment. Basal branches were broken from either physical (wind and water), mechanical (handling) or the sheer weight of each cluster of flower buds.

Photo 2. Broken basal branches of hibiscus plants caused by thin and weak stems and subsequent physical (wind and water) or mechanical (handling) damage.

To protect plants from further damage, rings were placed around each plant to provide the additional support the plants required (Photo 3).



Photo 3. To prevent further damage, poinsettia rings were placed around hibiscus plants to provide additional support.

The grower asked, “What caused the plants to grow tall and spindly and why did all the stems break?”

One clue is that the uniform stem breakage occurred among the whole crop and did not occur until plants were moved outdoors. Therefore, what the grower was witnessing among the hibiscus crop was the phenomenon called the “shade-avoidance response.” This is a plant response to competition from other plants, detected by a low red to far-red light ratio.

When plants are tightly spaced, there are two negative effects on plant quality. First, the amount of light available to the hibiscus plants was reduced because their leaves were competing with other plants to capture light. Second, the hibiscus leaves absorbed most of the red light, but reflected or transmitted (allowed to pass through the leaf) far-red light. In response to the high proportion of far-red light, the stems and branches stretched in an

attempt to absorb more light. As a result, the hibiscus plants grew tall, spindly and developed weak branches that broke by mechanical or physical damage. The branches were not able to support the large clusters of flower buds at the tip of every branch.

Although there is no way to “fix” the damage, some lessons can be learned to prevent stem breakage from occurring in the future. The first and easiest method is to increase the spacing between crops to allow the maximum amount of light to penetrate the canopy and basal branches. Hibiscus plants grown in greenhouse or outdoors with proper spacing and under high light intensities will be higher quality than those grown tightly spaced under low-light conditions.

Overall, [Michigan State University Extension](#) advises providing as much space as economically possible to ensure plant quality is maintained.

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