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# 101 Ways to Try to Grow Arabidopsis: Can Plants Be Transferred from Low Light Environment to High Light?

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## Purdue Methods:



## Can plants be transferred from low light environment to high light?

### Short answer:

Acclimate plants to higher light over 7-10 days

### Results:

Purpling of leaves is the first symptom of high light damage, usually occurring within 24 hours. We've saw this occur in our winter greenhouse study, when two-month old plants growing under natural day conditions were exposed to one 24-hour exposure to an additional 200  $\mu\text{mol}/\text{m}^2/\text{s}$  of light provided by a combination of metal halide and high pressure sodium fixtures. However, in our spring study, 14-day old plants moved from a growth chamber of 100  $\mu\text{mol}/\text{m}^2/\text{s}$  to a greenhouse where sunlight was measured in excess of 1000  $\mu\text{mol}/\text{m}^2/\text{s}$  did not show any damage.

### Discussion:

More study is needed in this area. We've demonstrated in our studies that plants can be damaged with artificial light sources at 300  $\mu\text{mol}/\text{m}^2/\text{s}$ , yet no such damage occurs under sunlight at three times that intensity. The anecdote described in the results above suggests that the transfer from low light into higher light is problematic, but only if the higher light is from an artificial source. Perhaps the plants are damaged by a certain spectral quality of the artificial light, but only at a certain developmental age. Since transferring plants from tissue culture to greenhouses or other higher light environments may be required in *Arabidopsis* research, it would be prudent to acclimate the plants over 7-10 days by using shading such as muslin or cheesecloth in greenhouses with supplemental lighting, or by slow ramping of light intensity in growth chambers.



**Figure 1. Plants transferred from low-light greenhouse into a greenhouse with supplemental lighting. Purpling of leaves observed after 2 days.**



**Figure 2. Young plants transferred from low-light growth chamber to greenhouse in springtime without supplemental lighting. No damage occurred.**

