

Evaluating greenhouse crops grown in media amended with wood materials



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Extension

Sphagnum peat moss is a major component in potting media used to grow greenhouse container crops

Peat is used because...

- High water-holding capacity
- High porosity (oxygen)
- Traditionally inexpensive + consistent

Recent issues with peat include...

- Increasing cost
- Inconsistent quality reports
- Now regarded as non-renewable



Peat often makes up 40% or more of a potting media

The other portion of a potting media is made up of secondary materials

Some secondary materials include...

- Coconut coir- increases drainage and oxygen availability to roots
- Perlite- increases oxygen availability to roots
- Vermiculite- helps nutrient retention
- And more...



New wood fiber and wood chip materials show potential as secondary materials in potting media

Wood materials are...

- Relatively low-cost
- Renewable resource

Potential drawbacks...

- Immobilize nitrogen
- Adjust irrigation practices
- Unknown effects on growth



Wood fiber research at the University of New Hampshire

Objectives:

1. Evaluate the performance of plants grown in media amended with wood fiber and wood chips
2. Evaluate the potential for wood fiber and wood chip media to immobilize nitrogen

Hypothesis:

- Media containing wood chips and wood fiber will immobilize nitrogen from the fertilizer and reduce plant growth

Petunia were grown in four types of potting media

Potting media types:

100% sphagnum peat (control)

70% sphagnum peat with:

- 30% wood fiber (European pine)
- 30% wood chips (loblolly pine)
- 30% coconut coir

Petunia were grown for six weeks in the greenhouse, simulating commercial production

- Fertilized with 200ppm N at each irrigation



Plant growth and quality was measured after six weeks

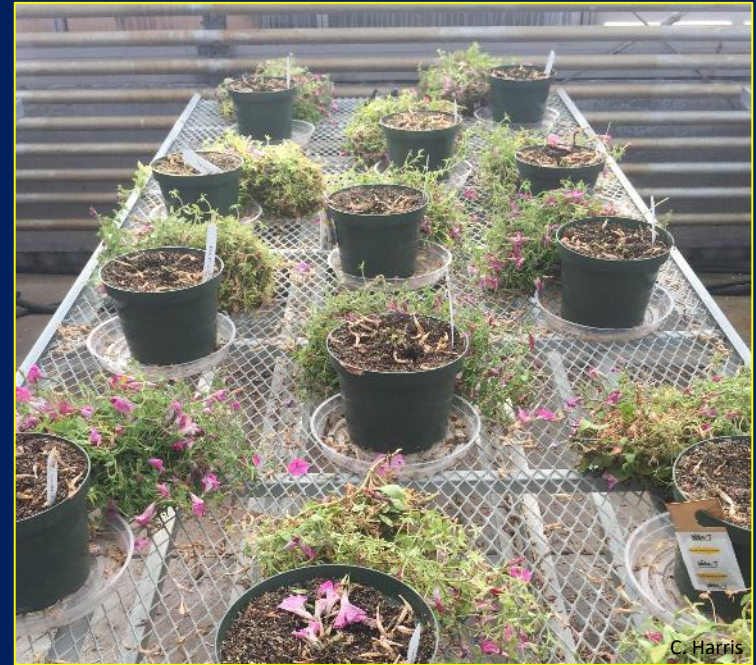
Plant growth was measured by harvesting and weighing both shoot and root tissue

Plant quality data included:

- Leaf “greenness” (leaf chlorophyll)
- Flower number per plant
- Nutrient concentrations in leaves

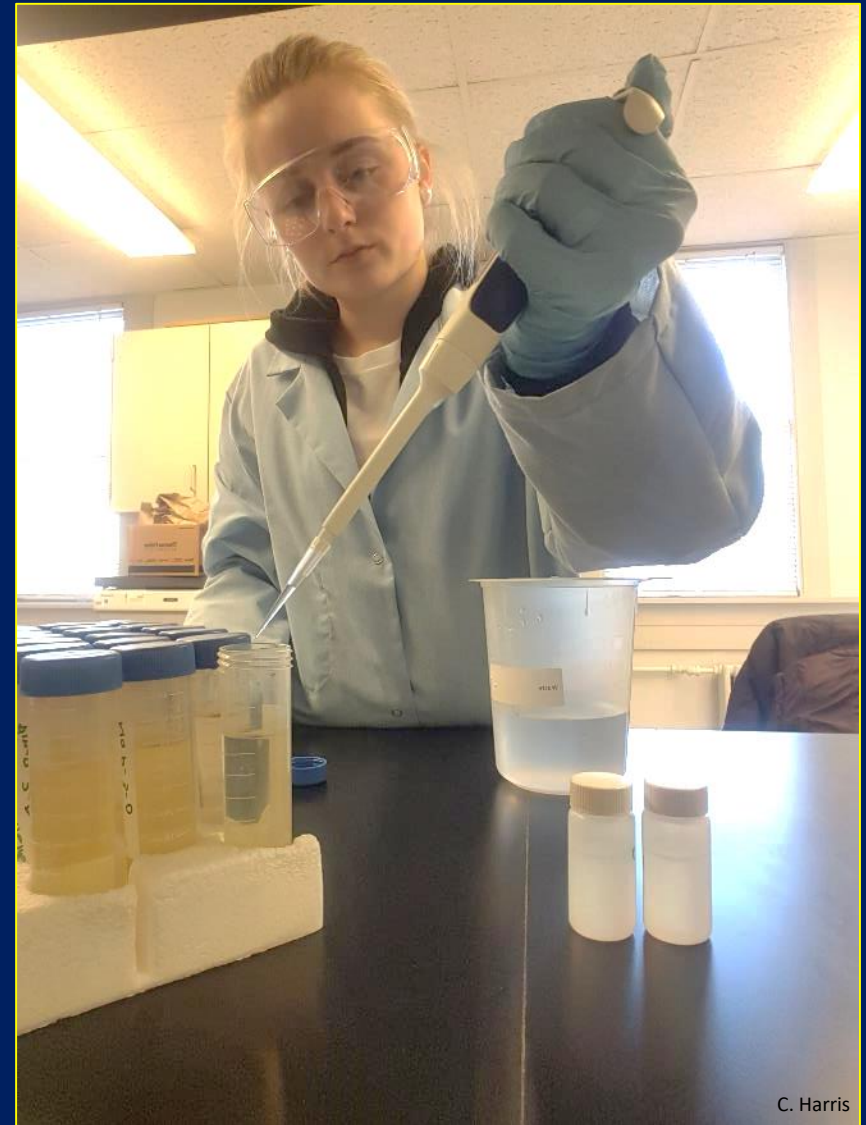
Media nutrient levels measured in each pot every 2 weeks

Photos taken every 2 weeks



Nitrogen immobilization was also measured in the lab

- Immobilization of fertilizer nitrogen was measured using a laboratory procedure
- A known amount of nitrogen was added to a sample of each media type
- Nitrogen concentration measured after a 20-day incubation period

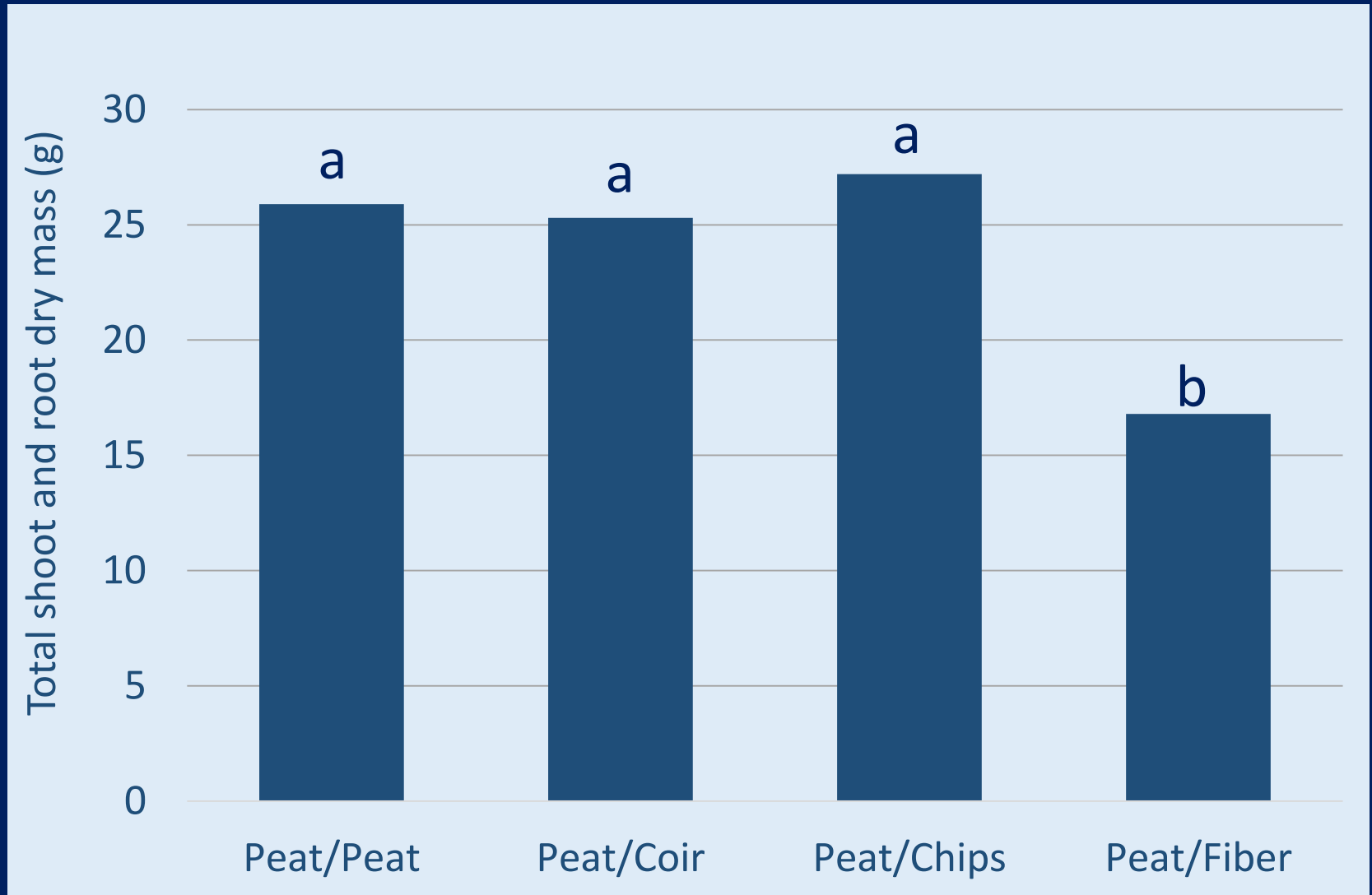


Results: Plants were of marketable quality after 6 weeks

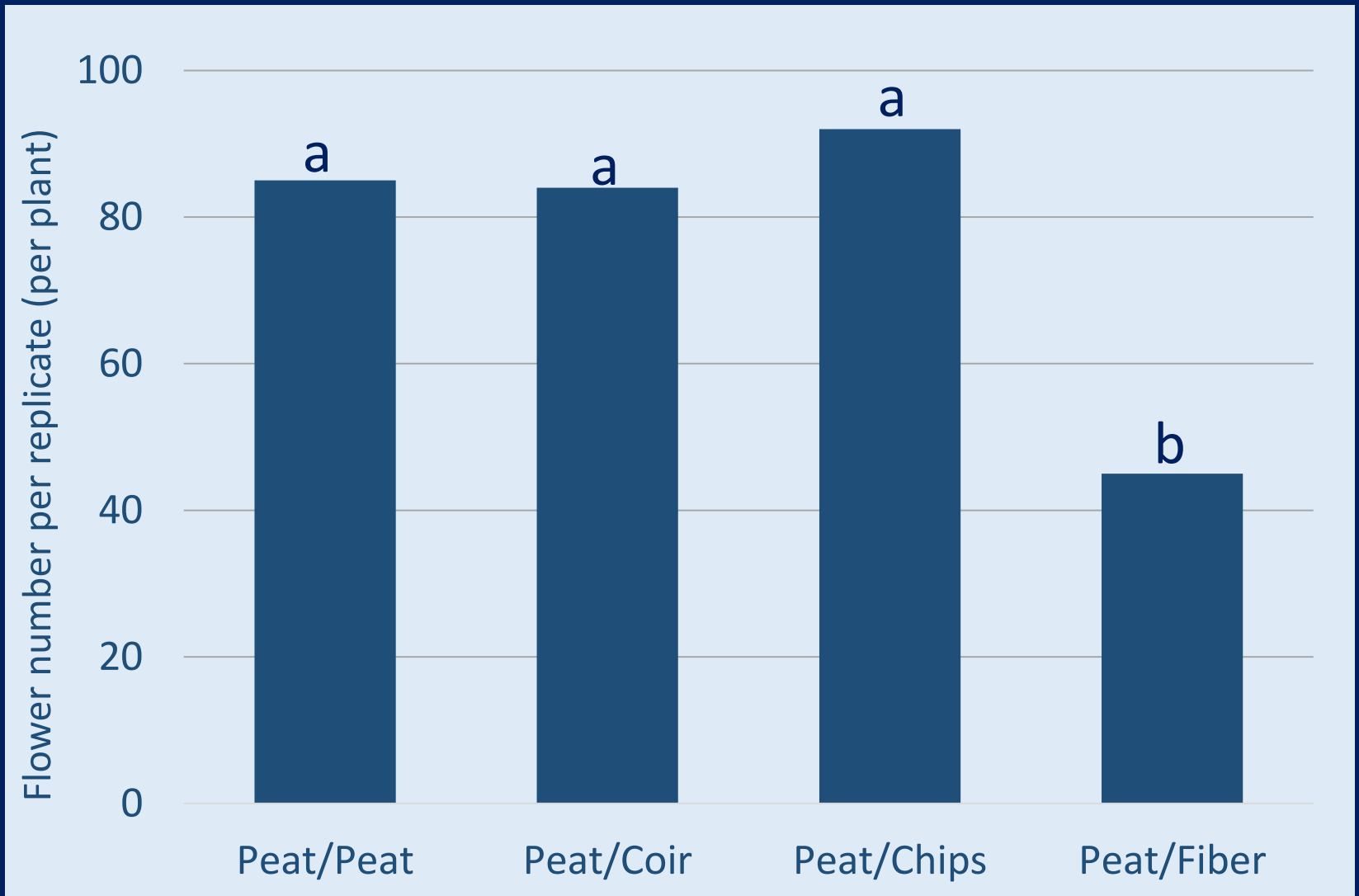


- Leaves were dark green (high chlorophyll content) with no differences between media types
- Plants had adequate nutrient levels for all media types
- Plants were visibly smaller in wood fiber media compared to 100% peat
- Nitrogen immobilization was not measured in the laboratory

Plant growth was lower in wood fiber media compared to 100% peat



Flower number was lower in wood fiber media compared to 100% peat



We continued to grow plants during a simulated retail or home garden phase



C. Harris

- Plants were grown for another six weeks with no fertilizer
- Media type had no effect on garden performance
 - All leaves turned visibly yellow (low chlorophyll content) with no differences between media types
 - All plants had low nutrient levels (>4% N/gram of tissue)
 - Media type had no effect on flowering

Conclusions

- All plants were green and healthy after six weeks in the greenhouse.
- Growth and flowering reduced slightly for plants in wood fiber media. This could reduce PGR use.
- Nitrogen immobilization was not detected in the laboratory portion
- Media type had little effect on plant performance during the home garden phase



Take home messages

- Growers can produce quality petunia in media with 30% wood fiber with little effect on plant performance and fertilizer practices
- Greater potential to affect plant growth and fertilizer practices with higher proportions of wood
- Wood fiber from other supplies produced similar results
- Upcoming project: Wood fiber substrate effects on substrate-pH and nutrient management in container crops



Thank you!

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Happy to answer any questions!

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