Grower Explainer: Using Biochar Without Losing PGR Efficacy

1. Why Is This Important? (Executive summary)

- **The Problem:** Growers moving toward sustainable substrates often worry that **biochar**, which is highly effective at filtering chemicals from water, will "tie up" expensive plant growth regulator (PGR) drenches like paclobutrazol (e.g., Piccolo), making them less effective.
- **The Discovery:** New research shows that wood-based biochar incorporated at rates of **15% to 30%** into peat-based substrates has **no impact** on the efficacy of paclobutrazol drenches.
- **The Bottom Line:** You can successfully use biochar as a perlite replacement without having to increase your PGR drench rates or costs.

2. Practical Takeaways (The "How-To")

- **Safe Incorporation Rates:** Wood-based biochar can be safely used at up to **30% by volume** in peat-based mixes without affecting PGR performance.
- **Particle Size Matters:** Both **coarse (<6 mm)** and **extra-coarse (>6 mm)** biochar particles were tested and found to be safe for use with drenches.
- **Crop Sensitivity:** This "no-impact" result held true across a range of crops, from less sensitive **poinsettias** to highly sensitive **pansies** and **begonias**.
- **Standard Rates Work:** Because the biochar did not reduce efficacy, you should continue using the **standard labeled drench rates** recommended for your specific crop and environment.

3. The Visual Evidence

The study confirmed that as paclobutrazol drench concentrations increased, plant height and diameter decreased predictably, regardless of whether the plant was in a standard perlite mix or a 30% biochar mix.

Treatment	Effect on Growth	Efficacy in Biochar vs. Perlite
Poinsettia drench	Predictable height control (e.g., 23% shorter at 0.5 mg/litre	No significant difference
Pansy/Begonia drench	Significant control even at low PBZ rates	No significant difference

4. Key Data Highlights

- **Poinsettias:** A single drench (0.5 to 4.0 mg/liter) provided identical growth control in both 30% biochar and 15-30% perlite substrates.
- **Pansies & Begonias:** Continual drench applications (6.25 to 100 µg/liter) showed that these sensitive crops reacted the same way to the PGR regardless of the substrate aggregate used.
- **Substrate Quality:** Plants grown in biochar-amended substrates were "all adequate" for production and comparable to traditional peat-perlite mixes.

5. Economic Impact & Considerations

- **No Hidden Costs:** You do not need to apply "extra" PGR to account for the biochar's presence, saving you money on chemical costs.
- **Sustainability Advantage:** Biochar offers a sustainable alternative to perlite without complicating your PGR management strategy.
- **pH Management:** Biochar is naturally basic (pH usually >7.0); using it may allow you to **reduce the amount of lime** added to your peat mix to reach a target pH of 6.0.

6. Going Forward (Diagnostic Tips)

The best way to adopt this research is through a staged approach. **Trialing small batches is essential** to account for the unique variables in your own facility.

- **The "Test Bay" Method**: Before switching your entire range to a biochar-amended mix, dedicate one bench or bay to the new substrate.
- **Check Your Work**: Use a **PourThru extraction** on your trial plants to check if your EC and pH match your standard production results.
- **Monitor Leaching**: This study used a 10% leaching fraction. If your leaching fraction is significantly higher or lower, your PGR results may vary.
- **Feedstock Verification**: These results apply specifically to **wood-based biochar**. If you source biochar made from other materials (like rice hulls or manure), perform a small-scale drench test first to ensure the PGR isn't being adsorbed.

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