Monitoring and early detection tools for reduced-peat substrates in plug trays

PEATLESS Project
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The problem

Plug-tray seedlings have **limited substrate volume and limited time to reach transplant quality**. Reducing peat can rapidly alter water retention, drying rate, pH, EC and nutrient availability, affecting emergence, uniformity and root development. Early detection enables management adjustment before quality is compromised.

The solution

Monitoring should combine **simple tools with observations at three stages.** Before sowing, check substrate parameters and irrigation water with portable devices. During emergence and growth, record emergence and uniformity and monitor wetting and drying. Before transplanting, inspect **root development, health and plug cohesion**.

Benefits

Regular monitoring **detects problems early**, supports management adjustment and helps maintain uniform, marketable transplants, avoiding problems being discovered only at the end of the nursery cycle.

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Practical Recommendations

- Before sowing: check key physicochemical parameters of the substrates as well as irrigation water, for example pH and electric conductivity (EC) using pH and EC meters, and record results per batch.
- During emergence: record emergence percentage and uniformity.
- During growth: monitor wetting and drying of substrates using regular observations, tray weight or, when available, moisture sensors. Interpret sensor readings for the specific substrate, as reduced-peat blends may differ in physical properties and sensor response.
- Throughout production: assess height, stem diameter, number of true leaves, colour, vigour and health. Use a ruler or digital calliper, visual scoring sheets and smartphone images to document growth and appearance. Use sticky traps and a hand lens for early pest detection.
- Before transplanting: inspect root development, root colour/health and plug cohesion. Protect casing materials and equipment from dust, debris and flies.

About PEATLESS and this Practice Abstract

This practice abstract was elaborated in the framework of the PEATLESS project, based on the EIP AGRI practice abstract format. © 2023
Project dates: from May 2025 to April 2028.
Goal: To characterise sectorial needs at selected systems towards tailoring PEATLESS alternative substrate blends to overcome identified barriers for peat reduction in horticulture.

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