NEW TOOLS FOR PLANT-RESPONSE NITROGEN TESTING OF PEPPERMINT UPDATE

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Peppermint, a crop that requires high rates of water and nitrogen fertilizer, was the focus of a nitrate-nitrogen (NO_3-N) sensing study. This project was funded by an Oregon Department of Agriculture Groundwater Research and Development Grant.

Differentially-fertilized 'Murray Mitchum' peppermint was evaluated using three methods of NO_3-N sensing: stem NO_3-N analysis, a CARDY ion meter that measures sap NO_3-N, and a SPAD chlorophyll meter. This study was designed to judge the accuracy of the two real-time sensors against the stem NO_3-N content determined in the laboratory. The three methods were evaluated using data collected on soil NO_3-N, dry matter yield, and fertilizer rates. The 1992 results indicated that all plant-based measurements can be influenced by factors other than NO_3-N stress.

In 1993, the same sensors were evaluated again using more fertilizer rates and three split applications of fertilizer in both 'Murray' and 'Black Mitchum' peppermint. At the time of this report, all the data has been collected and is ready for analysis excluding the soil samples. From preliminary observations, the CARDY measurements were not significantly different for the different N fertilizer levels.

The SPAD meter detected differences between treatments, but the sampling date had a great and inconsistent effect on the readings. The inconsistency appeared to be influenced by the weather that affected the leaf color, which may ultimately limit the usefulness of the SPAD meter.

The stem NO_3=N measurements were markedly distinguishable between N treatments. They were also influenced by cool weather in mid June. The soil data is not yet analyzed.