https://www.uvm.edu/~htunnel/

# Soil Testing in High Tunnels

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**May 10, 2023**

## Why should you use a different soil test for high tunnels?

Management of high tunnel soils differs from field soils, largely because of the lack of rainfall and because higher rates of amendments are needed to achieve yield potential in high tunnels. In addition, over time, certain nutrients (such as phosphorus) and soluble salts may accumulate to excessive levels. It is important to measure both nutrient levels and soluble salts. Further, fertilizer recommendations that accompany field soil tests are often insufficient for tunnel crops, which typically have a longer season and higher yield potential than field crops. Fertilizer recommendations should be adjusted to support these high yields. For more information on amendments and cultural practices, visit https://nevegetable.org/cultural-practices/high-tunnels.

## How to sample a high tunnel:

High tunnels should be sampled in a manner similar to field soils. Collect an aggregate sample several weeks prior to the time you intend to apply fertilizers. Collect at least 10-15 sub-samples per tunnel to a depth of 5-8 inches, where most roots grow. Do not mix samples from areas that have had significantly different rates of fertilizers or soil amendments applied previously – keep these areas separate. A soil augur is best for collecting an equal amount of soil from top to bottom of the sampling depth. If using a spade or trowel to sample, remove a wedge of soil, leaving a smooth edge to sample from. Then trim off a one-inch ribbon of soil that evenly represents the sample from top to bottom. Collect sub-samples in a "W" pattern from production areas. To get an accurate measurement of available N collect soil that has been warm and moist for a couple of weeks. Mix the subsamples in a clean bucket, break up clods and remove any debris. Pack 2 cups of the aggregate sample into a plastic bag and label clearly with farm name, tunnel name, and date taken. Keep the sample in a cool or refrigerated place until ready to mail. If possible, mail early in the week to avoid weekend delays.

## What type of soil test should you request?

For tunnels that are newly constructed (<3 years in production), UMaine offers a "basic high tunnel package" ($25) that uses the routine field soil analysis (modified Morgan extract). This analysis measures nutrients in "reserve" that are predicted to be plant available over the course of the season. In addition, the basic high tunnel test analyzes soils for nutrient salt buildup and nitrate availability/carryover.

For tunnels that have been in production for more than three years, the lab offers a "long term high tunnel package" ($30). This test uses two analyses: a field soil test (modified Morgan extract) to monitor all essential nutrients, and a "saturated media extract" (SME) to measure "nutrient intensity" or the level of water-soluble nutrients immediately available for plant uptake. The SME includes measures of available nitrogen and nitrate and ammonium, and soluble salts. Available nitrate-N is important to get transplants off to a good start as excess ammonium-N can damage plants. Soluble salts may accumulate due to lack of rain and snowfall in tunnels and can damage plant roots. Salts usually accumulate near the soil surface so tillage prior to sampling may provide a more accurate measurement.

Based on the results of your soil's nutrient analysis, UMaine also provides nutrient (fertilizer) recommendations aimed at meeting the high nutrient demand of tunnel crops. Visit the UMaine soil testing service for forms and updated information.

Send samples to:
Analytical Lab & Maine Soil Testing Service
5722 Deering Hall
Orono, Maine 04469-5722

 This material is based upon work supported by the National Institute of Food & Agric., U.S. Dept. of Agric., through the Northeast Sustainable Agric. Research & Education program under subaward number LNE22-445 & the Univ. of VT Extension under the Crop Protection and Pest Management Program [grant no. 2021-70006-35509/project accession no. 1027204]. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agric. & other funding agencies.