



SOIL SAMPLING PLAN

17.06.22

FOR FIRE MOUNTAIN FARMS, WESTERN WASHINGTON SITES

Introduction

This Soil Sampling Plan has been developed for Fire Mountain Farms Inc. Western Washington Land application sites as a component of our Site-Specific Land Application Plan. This Sampling plan is to give the reader instructions on how to take samples and how to care for samples and how results will be analyzed.

- **Confirm responsible government agencies received 72hrs notice to sampling event**
- **Use clean sampling tools.**
 - **A push probe or Soil auger (Manual or Automatic) can be used.**
 - **clean plastic bucket for each depth increment.**
 - **Brush and/or wipe sample tools between fields to remove all foreign material**
 - **To Clean tools between fields brush loose material from tools**
 - **Between Site locations clean tools with soap and water to remove all traces of soil.**
 - **Cooler with Ice or Cold Packs or alternative cooling device**
 - **Sample containers or zip lock bags**
 - **Sample log book, log date time weather conditions**

Sample each representative area *{* Representative area; may be single or multiple fields with similar soil and same crop & fertilizer management}

- **0 to 12 inches**
- **Core sample collection**
 - **Determine how many individual cores to take from chart below**

Sample points recommended by field size to form composite	
1-9 Acres	10 Cores
10-25 Acres	20 Cores
26-50 Acres	25 Cores
>51 Acres	30 Cores

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- At each sampling point remove loose material, including Biosolids and vegetative material from the surface then take the sample.
- Take subsamples randomly from the representative area, distribute subsample sites throughout the representative area. Put each core sample in bucket.
- Mix multiple cores thoroughly in a sample bucket with a ladle or trowel. Creating a composite sample of the multiple core samples
- Break up large clumps while mixing. Remove rocks and sticks while mixing. If sample is to be dried,
 - Place 5 cups of sample in clean zip lock bag, label with Unit, field and depth.
 - On return to office
 - fill out multi-sample soil test request form Including all samples taken that day.
 - Place the sample in drying pan and label with Field ID and depth
 - Place sample in to drying soil dryer to be no greater more than 65°C
 - Once sample is dry place approximately 2 cups in sample bag
 - Label sample bag with Field ID and depth
- If sample is to be frozen or delivered straight to lab; place about 2 cups of the mixed sample in a sample bag.
 - Fire Mountain Farms
 - Unit/ Field ID
 - Sample depth (i.e. 0-12)
 - At end of the day fill out multi-sample soil test request form including all samples taken that day.
- Fill out a Multi-Sample Soil Test Request form /Chain-of-Custody Form
 - Soil will be tested for
 - Nitrate-N (0-12") Method S-3.10 or other approved by Ecology
 - Soil Organic Matter (0-12") ** Method S-9.10 or other approved by Ecology
 - Soil pH* ** Method S-5.50 or S-2.70 or other approved by Ecology
 - Metals: ****
 - Arsenic (method EPA6010B or other approved by Ecology),
 - Cadmium (method EPA6010B or other approved by Ecology),
 - Copper (method EPA6010B or other approved by Ecology)
 - Lead (method EPA6010B or other approved by Ecology),
 - Mercury (method EPA7473 or other approved by Ecology),
 - Molybdenum (method EPA6010B or other approved by Ecology),
 - Nickel (method EPA6010B or other approved by Ecology),
 - Selenium (method EPA6010B or other approved by Ecology),

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- Zinc (method EPA6010B or other approved by Ecology).
- **Keep bags cool and out of the sun.**
 - If sample hold time is less than 3 days keep chilled and deliver to laboratory analysis.
 - If Sample hold time is expected to be Greater than 3 Days
 - Sample should be frozen or dried to halt microbial processes
- **Drying samples**
 - Within 24hrs remove sample from zip lock bag and place in clean drying pan.
 - Label sample with Unit, Field, Depth.
 - Place sample in dryer for greater than 24Hrs.
- **Log Sampling Event in Soil Sampling Log book.**
 - Date
 - Unit
 - Fields sampled
 - Who sampled and who Witnessed
 - Draw a rough map of where samples were pulled
- **Results and copy of sample log book will be provided to responsible government agencies with in 14 day of receiving results.**
- **Result interpretation.**
 - We will follow the guidance of “Post-harvest Soil Nitrate Testing for Manured Cropping Systems West of the Cascades D.M. Sullivan and C.G. Cogger’ were applicable, and adopt to other crops with the consultation of DOE and other professionals.
 - If we are low or high we will have to look at factors contributing to this.
 - Factors that could affect soil nitrogen
 - Timing of application
 - Length of growing season (temperature)
 - Amount of rain or irrigation water available
 - **More weight will be placed on the trend than on individual results**

{** soil organic matter to be run every 5 years on fields with 10 years or more of biosolids permitted Biosolids application history}

{*** Soil pH to be run on areas that have a history of lime stabilized Biosolids application}

{**** will be done pre-application and as directed by Ecology}

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