10 Minute Supervisor Trainings

March 2020

TESTING FOR MAXIMIZING NUTRIENT MANAGEMENT

Most good livestock owners will know the EPD's of the bull that was used to breed his/her cows, or the bushels of corn or beans produced per acre last year, but many do not know the pH or NPK levels of their farm fields. If we are to maximize our production on our farms, we need to know what nutrients are needed and what we are able to supply.

Taking Soil Test Samples

The most important part of making fertilizer recommendations is collecting a good, representative soil sample. Soil test results and fertilizer recommendations are based solely on the few ounces of soil submitted to the laboratory for analysis. These few ounces can represent several million pounds of soil in the field. If this sample does not reflect actual soil conditions, the results can be misleading and lead to costly over- or under-fertilization. It is necessary to make sure that the soil sample sent to the laboratory accurately represents the area sampled.

Sample Timing

Soil samples can be collected through much of the year, although fall (September to December) or spring (February to April) are the best times. Fall sampling will often result in a faster return of results and recommendations. Fall sampling will also allow the grower time to have the fertilizer applied well before planting the next crop. Fall applications of lime will also begin to improve pH levels prior to spring crop growth. Most fields should be sampled every three to four years. High-value crops, such as tobacco, commercial horticultural crops, alfalfa, red clover, and corn silage, should be sampled annually so that plant nutrient levels can be monitored more closely. Application of manure can change soil test phosphorus, potassium, and zinc levels dramatically, so sampling manured fields each year is also recommended.

Collecting Field Crop Samples

An individual sample should represent no more than 20 acres except when soils, past management, and cropping history are quite uniform. If a field is growing different crops, or has slopes and bottom more level areas, it may be divided and treated as multiple fields for sampling purposes. Sample depths of 6-8 inches in tilled areas and 3-4 inches in non or reduced tilled areas. DO NOT SAMPLE: old fencerows, areas used for manure or hay storage and livestock feeding, areas where lime or fertilize has been piled or spilled, unusually wet areas, and any other area that is reasonably not consistent with the rest of the field.

Sampling Frequency VS Sampling Results

Soil sampling on a random basis will only give a snapshot of fertility levels at a given point in time. Follow up sampling (at the same time from year to year) will provide a more accurate determination of how inputs of lime, fertilize, and manure are affecting the soil fertility and soil health over time. It will also be a reliable tool when accurately managing soil fertility.

Livestock Waste Sampling and Testing

It is estimated that about 25 million tons of animal manure are currently produced on Kentucky farms each year. Most of this is deposited by grazing animals on pastures where the nutrients are recycled. However, an increasing percentage is accumulated in feed lots, barns, poultry houses, lagoons, and other facilities until it can be spread on the land. As we continue to expand on State Cost Share livestock practices for both confinement and pasture feeding systems, livestock waste utilization as a means of improving farm nutrient management levels is not only necessary it is also very cost effective.

Nutrient Value

Average nutrient content of manure samples as received in KY's regulatory services lab listed Poultry Broiler litter providing N P2O5 K2O % lbs./ton of 48.2, 6.8, & 47.0. Dairy Stack pad samples provided 9.0, 8.2, & 10.0 lbs./ton. Data from USDA also shows average nutrient contents of fresh manure from beef with 9.1, 14.2, & 8.4, swine with 13.4, 16.3, & 6.6, and sheep with 21.9, 26.8, & 21.8 lbs./ton respectively.

How to Sample

A good sample is one that represents the particular batch of animal waste being tested. This may be one poultry house, a stack of solid manure, a storage tank, or lagoon. Effective sampling methods will be different for each.

Solid Wastes: Poultry (floor grown) — Take 10 to 12 subsamples of about one pint each from different areas of the house to the full depth of accumulation. Take samples under waterers and feeders in proportion to the area they occupy.

Poultry (caged layers) — Take 10 to 12 subsamples of about one pint each from random areas under the cages to the full depth of accumulation.

Stacked manures — Take 10 to 12 subsamples of about one pint each from random areas over the entire stack. Sampling should extend as deep as possible into the stack. Do not limit your testing just to samples from the surface.

Livestock feeding areas (covered or uncovered) — Take 10 to 12 subsamples of about one pint each from random locations over the whole area. Sampling should extend to the full depth of manure accumulation.

Liquid Wastes: Holding tanks — These need to be agitated, or stirred, to thoroughly mix the solids with the liquid to get a good sample. The sample can be taken by dipping from the tank or collecting wastes as they are pumped out. *Be careful* to avoid exposure to *toxic gases* while sampling holding tanks.

Holding ponds or lagoons — It is difficult to take representative samples from ponds or lagoons until they have been agitated and thoroughly mixed. Good samples can be taken if special sampling devices are available. These allow subsamples to be taken from different depths and various locations to collect a sample that is representative of the whole pond.

Collecting and Handling All Samples

As always, results will only be as good as the samples collected. With both soil and manure sampling, use clean probes/spades and plastic buckets for collecting. Use clean zip type bags for solid samples and plastic leak proof bottles (no glass) for liquid samples. Use a permanent ink marker, label the bottle/bag with owner's name, sample ID, type of sample, and county. Make sure to record what fields are producing, past lime/fertilize applications, etc. and what species of animals the sample is from. For additional information & sampling forms, please contact your local extension office for plastic bottles and soils cartons for sample shipping.

Soil Sample Information Sheet

UNIVERSITY OF KENTUCKY

Department of Agronomy | **College of Agriculture Cooperative Extension Service** | **Division of Regulatory Services**

AGRICULTURAL SOIL SAMPLE INFORMATION SHEET

Section I. Farmer I.D. No. ☐☐☐☐☐☐ Date Sample Received by County: _____

Name _____

Address _____

City _____ State _____ Zip _____

Telephone Number ___/___ Acres: _____

Owner's Sample Identification ☐☐☐☐

Section II. Test(s) to Be Made
(Mark only one group test)

01 Routine Soil Test (P, K, pH, buffer
☐ pH, Ca, MG, Zn)

In Addition to Above Only
☐ OM (Org. Matter) ☐ BO (Boron)

— or —

15 Triazine, AZ (Atrazine)
☐ and SZ (Simazine)

Section VI. Lab Use Only

Section VII.
For County Use Only

☐☐☐ County Code

☐☐☐☐ County Sample #

Section VIII.
Lab Use Only
Billing Code ☐

Section IX.
FSA ☐
Check if copy is to be sent to FSA office.

Owner's Field Identifier (Descriptive Name)

_____

_____

_____

Soil Series Name:

Section IIIa. Crop Codes

NOTE: Mark only one in each column. See additional crop lists for other codes.

	Primary Crop	Alternate Crop	Previous Crop	
02	☐	☐	☐	Alfalfa
04	☐	☐	☐	Alfalfa — Grass
01	☐	☐	☐	Canola
03	☐	☐	☐	Canola — Soybeans
05	☐	☐	☐	Cool Season Grass
18	☐	☐	☐	Corn
07	■	■	☐	Fallow
22	☐	☐	☐	Fescue
78	☐	☐	☐	Fescue/Lespedeza*
76	☐	☐	☐	Forage Crops*
74	☐	☐	☐	Grain Crops*
28	☐	☐	☐	Lespedeza
09	☐	☐	☐	Lespedeza — Grass
38	☐	☐	☐	Red Clover
40	☐	☐	☐	Red Clover — Grass
11	☐	☐	☐	Small Grains
46	☐	☐	☐	Small Grains — Corn
13	☐	☐	☐	Small Grains — Soybeans
50	☐	☐	☐	Soybeans
15	☐	☐	☐	Tobacco Beds
58	☐	☐	☐	Tobacco, Burley
60	☐	☐	☐	Tobacco, Dark
19	☐	☐	☐	Warm Season Grass
72	☐	☐	☐	White Clover — Grass
	☐	☐	☐	From Memo: _____ **
	☐	☐	☐	From Memo: _____ **
	☐	☐	☐	From Memo: _____ **
98	☐	☐	☐	Other: _____

Section IIIb. Crop Management/Use

		Primary Crop x one	Alternate Crop (if desired)	Previous Crop x one
Part A. Management				
Conventional Tillage	01	☐	☐	☐
No Tillage	02	☐	☐	☐
Hay or Pasture less than 4 years	03	■	■	☐
Hay or Pasture 5 years or longer	04	■	■	☐
Doublecrop-Conventional	05	☐	☐	☐
Doublecrop-No Till	06	☐	☐	☐
New Seeding	07	☐	☐	☐
Renovation	08	☐	☐	☐
Annual Top Dressing	09	☐	☐	☐
Part B. Use		x one	x one	x one
Grain	01	☐	☐	☐
Silage	02	☐	☐	☐
Tobacco	03	☐	☐	☐
Hay	04	☐	☐	☐
Pasture	10	☐	☐	☐
Seed Production	05	☐	☐	☐
Silage-Grain (double crop)	07	☐	☐	☐
Grain-Grain (double crop)	08	☐	☐	☐
Silage-Silage (double crop)	09	☐	☐	☐
Cover Crop	11	☐	☐	☐
Other _____	98	☐	☐	☐

* Multiple lime and fertilizer computer recommendations without comments.
Forage Crops = Alfalfa/Bluegrass/Fescue/Orchardgrass.
Grain Crops = Corn/Grain Sorghum/Soybeans/Wheat

** Write in CROP NAME & CODE from memo.

Section Va.

For Tobacco Only:

What was there 2 years ago?

Good Sod	1	☐
Medium Sod	2	☐
Poor Sod	3	☐
Tobacco	4	☐
Other	5	☐

Section Vb. Soil Drainage*

(x one)

Well	1	☐
Moderately Well	2	☐
Somewhat Poorly	3	☐
Poorly	4	☐
Poorly, but tiled	5	☐

*Important for Corn and Tobacco Nitrogen Recommendations.

Section IV. Fertilizer-Lime History

Fertilizer Applied In The Past 12 Months:

_____ lb/A _____ lb/A _____ lb/A
N P_2O_5 K_2O

Lime Applied in Past 3 Years: _____ T/A

Date Lime Applied: _____
Month Year

Manure Applied Past 12 Months _____ T/A

Paid ☐

_____
Signature of Extension Agent

RS-50-01I-2

Manure Sample Information Sheet

UNIVERSITY OF KENTUCKY
College of Agriculture Cooperative Extension Service
AGRICULTURE ANIMAL WASTE SAMPLE INFORMATION SHEET
Department of Agronomy Division of Regulatory Services

Section 1
DATE SAMPLED ___/___/___
NAME _____
ADDRESS
CITY, ST, _____
ZIP _____ __ ___
PHONE _____
Owner's Sample ID

Section II
Test to be made

Routine (Total N, P2O5, K2O, and moisture for solids.)

Section VI. (lab use)
_____
ion VII. (Cou
County Code
County Sample No.

Section III TYPE OF ANIMAL WASTE
_____ Poultry _____Solid
_____ Dairy _____Liquid
_____ Swine
_____ Beef

Section VIII
(Lab Use Only)
Billing Code _____

Section IV. Animal Waste Application history

Section V. Other Information

Paid ___ _____
Signature of Extension Agent

NOTE; See back for sampling information