Tennessee Department of Environment and Conservation,
Division of Water Resources
William R. Snodgrass-Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor, Nashville, TN 37243
(615) 532-0625

CONCENTRATED ANIMAL FEEDING OPERATION (CAFO)
STATE OPERATING PERMIT (SOP)
NOTICE OF INTENT (NOI)

Type of permit you are requesting: ☐ SOPCD0000 (designed to discharge) ■ SOPC00000 (no discharge) ☐ Unknown, please advise

Application type: ☐ New Permit ■ Permit Reissuance ☐ Permit Modification

If this NOI is submitted for Permit Modification or Reissuance provide the existing permit tracking number: _____

OPERATION IDENTIFICATION

Operation Name: Tosh Herrondale Sow Unit	County: Henry
Operation Location/ Physical Address: Herrondale West Road Henry, Tn 38231	Latitude: 36.25334
	Longitude: -88.48309

Name and distance to nearest receiving water(s): 250 feet, Tributary of Middle Fork Obion River

If any other State or Federal Water/Wastewater Permits have been obtained for this site, list those permit numbers: SOPC00255

Animal Type: ☐ Poultry ■ Swine ☐ Dairy ☐ Beef ☐ Other ____

Number of Animals: 16550	Number of Barns: 4	Name of Integrator: Tosh Pork

Type of Animal Waste Management: (check all that apply)
☐ Dry
☐ Liquid
■ Liquid, Closed System (i.e. covered tank, under barn pit, etc.)

Attach the NMP ■ NMP Attached	Attach the closure plan ■ Closure Plan Attached	Attach a topographic map ■ Map Attached

PERMITTEE IDENTIFICATION

Official Contact (applicant): Jimmy Tosh	Title or Position: Owner			
Mailing Address: 1586 Atlantic Anenue	City: Henry	State: TN	Zip: 38231	☐ Correspondence ☐ Invoice
Phone number(s): 731-243-4861	E-mail:			
Optional Contact:	Title or Position:			
Address:	City:	State:	Zip:	☐ Correspondence ☐ Invoice
Phone number(s):	E-mail:			

APPLICATION CERTIFICATION AND SIGNATURE (must be signed in accordance with the requirements of Rule 0400-40-05-.14)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and title; print or type	Signature	Date

STATE USE ONLY

Received Date	Reviewer	EFO	T & E Aquatic Fauna	Tracking No.
	Impaired Receiving Stream	High Quality Water		NOC Date

CAFO NOTICE OF INTENT INSTRUCTIONS

Background. All operations defined as CAFOs (concentrated animal feeding operation) must seek coverage under a permit. Operations that meet the Class II size criteria (TDEC Rule 0400-40-05-.14) and that discharge or that propose to discharge (...if designed, constructed, operated or maintained such that a discharge will occur) need coverage under the General State Operating Permit (SOP) for Concentrated Animal Feeding Operations, Permit Number SOPCD0000. Operation meeting the size criteria for either a Class I or Class II operation that do not discharge and that do not propose to discharge, but otherwise meet criteria in state rules need coverage under the General State Operating Permit (SOP) for Concentrated Animal Feeding Operations (CAFOs), Permit Number SOPC00000. AFOs (animal feeding operations) meeting or exceeding the size thresholds in column 1 of table 0400-40-05-14.1 are considered large (Class I) CAFOs. Class I CAFOs that propose to discharge must apply for an individual NPDES permit (application forms are available at: http://www.state.tn.us/environment/permits/h2oforms.shtml). All other CAFOs must apply for a state permit using this form. This form must be submitted at least 180 days before a CAFO commences operation.

Complete the form. Type or print clearly, using black or blue ink; not markers or pencil. Answer each item or enter "N/A," for not applicable. If you need additional space, attach a separate piece of paper to the NOI. Applicants must submit a NMP (Nutrient Management Plan), and a closure plan along with this NOI. **The application will be considered incomplete without supplying all of the required information.**

Operation Identification. Describe and locate the project, use the legal or official name of the facility or site. Provide the latitude and longitude (expressed in decimal degrees) of the center of the site, which can be located on USGS quadrangle (i.e. topographic) maps. Topographic maps may be obtained at the USGS website: http://store.usgs.gov. Attach a copy of a portion of a 7.5 minute quad map (i.e. 1:24,000-scale topographic map), showing location of site, with boundaries at least one mile outside the site boundaries.

Permittee Identification. **Official Contact** – Provide the name, telephone number, address, and E-mail address of the person or corporation which proposes to operates or operates and/or profits from this AFO. **Facility Contact** – Provide the name, telephone number, address, and E-mail address of the person most familiar with the operation and with the facts reported in the NOI. This person may be contacted by the division, if necessary. Indicate where to send correspondence and invoices.

Fees. There is no application fee for this permit. An annual maintenance fee may be required and you will be invoiced at a later date.

Submitting the form and obtaining more information. Note that this form must be signed by the chief executive officer, owner, or highest ranking elected official. Submit a complete application to both the Tennessee Department of Agriculture (TDA) and to TDEC-WPC; keep a copy for your records. Original documents should be sent to TDEC-WPC and a copy should be sent to TDA, at the addresses below:

CAFO Notice of Intent TDEC Division of Water Resources William R. Snodgrass - Tennessee Tower 312 Rosa L. Parks Avenue, 11th Floor Nashville, TN 37243	CAFO Notice of Intent Water Resources TDA-Ellington Agricultural Center PO Box 40627 Nashville, TN 37204

Upon receipt of the required items the division will conduct a review of the material, and notify the applicant of any deficiencies. Notification may also come from the Tennessee Department of Agriculture, which reviews the NMP. When all the deficiencies have been corrected, the division will process the NOI and issue permit coverage.

The division has the right to inspect a facility when deemed necessary. In addition, the division has the right to revoke or suspend any permit for violation of permit conditions or any other provisions of the Tennessee Water Quality Control Act and other water pollution control rules.

The division is responsible for regulating any activity, which involves a potential discharge in order to protect waters of the State from pollution and to maintain the highest possible standards in water quality.

Obtaining more information/assistance For more information or assistance, contact your local Environmental Field Office (EFO), toll-free, at 1-888-891-8332 (TDEC) or at the number listed below.

EFO	Street Address	City	Zip Code	Telephone
Chattanooga	540 McCallie Avenue STE 550	Chattanooga	37402	(423) 634-5745
Columbia	1421 Hampshire Pike	Columbia	38401	(931) 380-3371
Cookeville	1221 South Willow Ave.	Cookeville	38506	(931) 432-4015
Jackson	1625 Hollywood Drive	Jackson	38305	(731) 512-1300
Johnson City	2305 Silverdale Road	Johnson City	37601	(423) 854-5400
Knoxville	3711 Middlebrook Pike	Knoxville	37921	(865) 594-6035
Memphis	8383 Wolf Lake Drive	Bartlett	38133	(901) 371-3000
Nashville	711 R S Gass Boulevard	Nashville	37216	(615) 687-7000

NRCS Natural Resources Conservation Service

Comprehensive Nutrient Management Plan (CNMP)
(Version 3, 8/17/2016 Format)

The Comprehensive Nutrient Management Plan (CNMP) is an important part of the conservation management system (CMS) for your Animal Feeding Operation (AFO). This CNMP documents the planning decisions and operation and maintenance information for the AFO.

Farm/Facility: Herrondale Sow Farm
Herrondale West Road
Henry, TN 38231
731 243 4861

GPS Coordinates: 36.25334, -88.48309

Owner/Operator: Jimmy Tosh Owner, Jay Oliver Operator

Plan Period: Oct 2017 - Sep 2022

Certified Comprehensive Nutrient Management Plan (CNMP) Planner

As a Certified Comprehensive Nutrient Management Plan (CNMP) Planner, I certify that I have reviewed the *Comprehensive Nutrient Management Plan* and that the elements of the document are technically compatible, reasonable and can be implemented.

Signature: _____ Date: 1-2-18
Name:
Title: TSP Certification Credentials:

Conservation District (Optional)

As a Conservation District employee, I have reviewed the *Comprehensive Nutrient Management Plan* and concur that the plan meets the District's conservation goals.

Signature: _____ Date: _____
Name:
Title:

Owner/Operator

As the owner/operator of this CNMP, I, as the decision maker, have been involved in the planning process and agree that the items/practices listed in each element of the CNMP are needed. I understand that I am responsible for keeping all necessary records associated with implementation of this CNMP. It is my intention to implement/accomplish this CNMP in a timely manner as described in the plan.

Signature: _____ Date: 2-9-18
Name:

Table of Contents

Section 1. Farmstead (Production Area)

1.1. Maps of Existing and Planned Farmstead Conservation Practices

Legand:
Composter
Gestation Barn 1
Gestation Barn 2
Farrowing Barn 1
Farrowing Barn 2

1.2. Farmstead Conservation Practices -- Record of Decisions

Waste Storage Facility (313)

Facility(s)	Planned amount (No.)	Month	Year	Amount Applied	Date
5	5	3	2017	Already applied	
Total	5				

A waste impoundment structure has been constructed, according to NRCS specifications to temporarily store waste such as manure, wastewater, and contaminated runoff as a function of an agricultural waste management system which will protect the environment and public health and safety. Practice lifespan is 15 years. Refer to design drawings and practice standard 313 for additional information.

Composting Facility (317)

Create composting facility to properly dispose of dead hogs. Compost will need to be tested for nutrient levels. See Practice Standard 317.

Field(s)	Planned amount (No.)	Month	Year	Amount Applied	Date
1	1.0	3	2017		
Total	1.0				

All dead pigs must be immediately put in the compost facility and covered with a carbon matter. Suggested carbon matter is sawdust.

Critical Area Planting (342)

Barn(s)	Planned amount (No.)	Month	Year	Amount Applied	Date
Gestation 1	1.0	3	2017	Applied	
Gestation 2	1.0	3	2017	Applied	
Farrowing 1	1.0	3	2017	Applied	
Farrowing 2	1.0	3	2017	Applied	
Composter	1.0	3	2017	Applied	
Total	5.0	3	2017	Applied	

Critical area planting will be done to stabilize the soil, reduce damage from sediment and runoff to downstream areas, and improve wildlife habitat and visual resources. Adapted vegetation such as trees, shrubs, vines, grasses, or legumes will be established to limit severe erosion or sediment damage. See additional narrative for specific recommendations on seeding rates, dates, fertility requirements, and construction shaping required.

Or

Maintain areas around buildings and composter to ensure clean water is diverted from production areas and erosion is limited.

All NRCS conservation practices shall be installed, operated and maintained according to NRCS conservation practice standards and associated technical specifications.

1.3. Farmstead Conservation Practices – Implementation Requirements

UT Extension

W255

Disposing of Large Animal Mortalities in Tennessee

Forbes Walker, Associate Professor, and Shawn Hawkins, Assistant Professor
Biosystems Engineering and Soil Science

Animal deaths are a regrettable but sometimes unavoidable part of livestock production. Once an animal dies, it is important to handle and dispose of the carcass in a way that reduces the potential for impacting the health of humans and other livestock and minimizes the impact to the environment, such as pollution of groundwater or surface water. It is recommended that dead animals be disposed of within 48 hours of discovery in a way that follows state guidelines.

In May 2009, the Tennessee Department of Agriculture released its guidelines on handling mortalities in a short policy document entitled "Policy Concerning the Disposal of Dead Farm Animals and The Disposal Offal from Custom Slaughter Facilities." This document can be viewed at the Tennessee Department of Agriculture's website at: http://tn.gov/agriculture/publications/regulatory/animaldisposal.pdf

In Tennessee, dead animal carcasses are defined as a "solid waste," so are regulated by the Tennessee Department of the Environment and Conservation (TDEC), Division of Solid Waste. The disposal of dead animals falls under the solid waste regulations outlined by TDEC at its website: http://www.tennessee.gov/sos/rules/1200/1200-01/1200-01-07.20081126.pdf

The methods that livestock producers in Tennessee can choose to dispose of their dead animals include:

- On-farm burial
- Composting
- Landfilling
- Burning
- Incineration
- Rendering

the center of this base material with the extremities at least 2 feet away from the edge of the base material. Finally, the carcass should be covered with 2 feet of amendment that is mounded to divert rather than capture rainfall. The process will be complete in 3-9 months (only bones are left) and the material can then be land-applied.

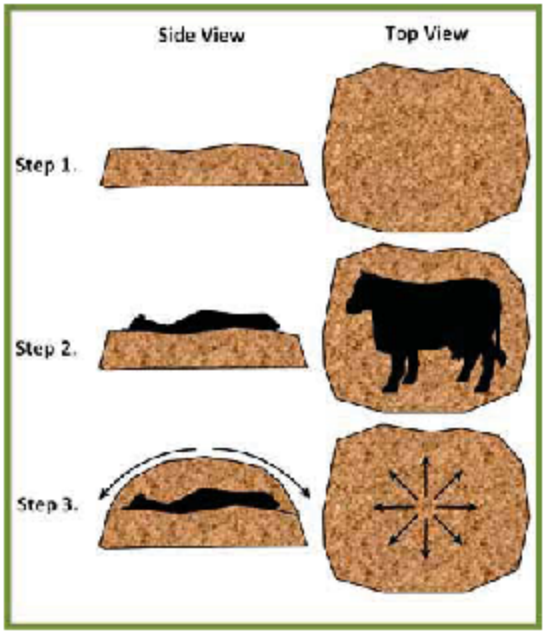


Figure 1. Top and side view schematics illustrating static pile composting of a large animal mortality. Rainfall drainage is illustrated in Step 3.

THE UNIVERSITY of TENNESSEE
INSTITUTE of AGRICULTURE

Visit the UT Extension website at
http://utextension.tennessee.edu

W-251 2/11 11-0123

Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences, and resource development.
University of Tennessee Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating.
UT Extension provides equal opportunities in programs and employment.

1.4. Animal Inventory

Animal Group	Type or Production Phase	Number of Animals[a]	Average Weight (lbs)	Confinement Period	Manure Collected (%)[b]	Manure Storage
Gestation1	Gestating sow	3,000	400	Jan Early - Dec Late	100	Gestation Barn 1
Gestation2	Gestating sow	2,400	400	Jan Early - Dec Late	100	Gestation Barn 2
Farrowing 1	Sow & litter	576	400	Jan Early - Dec Late	100	Farrowing 1
Farrowing 2	Sow & litter	576	400	Jan Early - Dec Late	100	Farrowing 2
Piglets	Nursery pig	10,000	8	Jan Early - Dec Late	100	Farrowing 1

a. The average number of animals present in the production facility at any one time.
b. If manure collected is less than 100%, this indicates that the animals spend a portion of the day outside of the production facility or the production facility is unoccupied one or more times during the confinement period.

1.5. Manure Storage Information

Storage ID	Type of Storage	Pumpable or Spreadable Capacity	Annual Manure Collected	Maximum Days of Storage
Gestation Barn 1	In-house storage pit	4,084,080 gal	980,000 gal	1,521
Gestation Barn 2	In-house storage pit	3,534,300 gal	490,000 gal	2,633
Farrowing 1	In-house storage pit	2,699,813 gal	465,000 gal	2,119
Farrowing 2	In-house storage pit	2,699,813 gal	465,000 gal	2,119

1.6. Planned Manure Exports

Month-Year	Manure Source	Amount	Receiving Operation	Location

(None)

1.7. Planned Manure Imports

Month-Year	Manure's Animal Type	Amount	Originating Operation	Location

(None)

1.8. Planned Internal Transfers of Manure

Month-Year	Manure Source	Amount	Manure Destination

(None)

1.9. Brief Description of or Additional Information about Animal Feeding Operation (Optional)

Herrondale Sow Unit is owned and operated by Jimmy Tosh and Operated by Jay Oliver. It consists of 4 barns with 6,550 pigs at 400 pounds and 10,000 pigs at 8 pounds. Total animals being 16,550. It is a nursery and farrowing unit. All manure is stored in house pit storage and is injected to fields Tosh Farms tends on a 2 year P basis in spring or fall. Soil test are taken as required to ensure proper application rate. Tosh Farms owns and maintains all application equipment to prevent accidental spillage. Tosh Pork supplies all feed management. Normal deaths will be composted in a carbon material, like sawdust. The closest stream, 250 feet away, is a tributary of the Middle Fork Obion River.

1.2. Sampling, Calibration and Other Statements

- Manure sampling frequency
  Manure test will be taken each time manure is applied to ensure proper rate.
- Soil testing frequency
  Soil test will be taken as required, every 3 years.
- Equipment calibration method and frequency
  Tosh Farms will ensure the flow meter and equipment is calibrated correctly.
- Clean water diversion
  No clean water will enter pit. It is sealed off from outside water.
- Measures to prevent direct contact of animals with water
  All animals will remain inside above the under floor pit.

1.3. Natural Resource Concerns

If checked, the indicated resource concerns have been identified and have been addressed in this plan.

Soil Quality Concerns

	Soil Quality Concern	*Activities to Address Concern*
	Ephemeral Gully Erosion	

	Soil Quality Concern	*Activities to Address Concern*
	Gully Erosion	
	Sheet and Rill Erosion	
X	Stream/Ditchbank Erosion	Waterways in place to keep gullies from eroding
	Wind Erosion	

Water Quality Concerns

	Water Quality Concern	*Activities to Address Concern*
	Facility Wastewater Runoff	
X	Manure Runoff (Field Application)	All fields in plan
X	Manure Runoff (From Facilities)	All manure stored in pit
	Nutrients in Groundwater	
	Nutrients in Surface Water	
	Silage Leachate	
	Excessive Soil Test Phosphorus	
	Tile-Drained Fields	

Other Concerns Addressed

	Other Concern	*Activities to Address Concern*
	Acres Available for Manure Application	
	Aesthetics	
	Maximize Nutrient Utilization	
	Minimize Nutrient Costs	

	Other Concern	*Activities to Address Concern*
X	Neighbor Relations	Setbacks followed
	Profitability	
	Regulations	
	Soil Compaction	
X	Time Available for Manure Application	Manure will be applied in fall or spring.
	Odors	
X	Air Quality	This facility shouldn't affect air quality
X	Biosecurity	Plan in place.

In Case of an Emergency Storage Facility Spill, Leak or Failure

Implement the following first containment steps:

a. Stop all other activities to address the spill.
b. Stop the flow. For example, use skid loader or tractor with blade to contain or divert spill or leak.
c. Call for help and excavator if needed.
d. Complete the clean-up and repair the necessary components.
e. Assess the extent of the emergency and request additional help if needed.

In Case of an Emergency Spill, Leak or Failure during Transport or Land Application

Implement the following first containment steps:

a. Stop all other activities to address the spill and stop the flow.
b. Call for help if needed.
c. If the spill posed a hazard to local traffic, call for local traffic control assistance and clear the road and roadside of spilled material.
d. Contain the spill or runoff from entering surface waters using straw bales, saw dust, soil or other appropriate materials.
e. If flow is coming from a tile, plug the tile with a tile plug immediately.
f. Assess the extent of the emergency and request additional help if needed.

Emergency Contacts

Department / Agency	Phone Number
Fire	731-642-1413
Rescue services	731-642-5581
State veterinarian	615-837-5183
Sheriff or local police	731-642-1672

Nearest available excavation equipment/supplies for responding to emergency

Equipment Type	Contact Person	Phone Number
Trackhoe	James Tosh	731-243-4861

Contacts to be made by the owner or operator within 24 hours

Organization	Phone Number
EPA Emergency Spill Hotline	1-800-424-8802
County Health Department	731-642-4025
Other State Emergency Agency	1-888-891-8332 TDEC's Water Pollution Control

Be prepared to provide the following information:

a. Your name and contact information.
b. Farm location (driving directions) and other pertinent information.
c. Description of emergency.
d. Estimate of the amounts, area covered, and distance traveled.
e. Whether manure has reached surface waters or major field drains.
f. Whether there is any obvious damage: employee injury, fish kill, or property damage.
g. Current status of containment efforts.

Biosecurity Measures

Biosecurity is critical to protecting livestock and poultry operations. Visitors must contact and check in with the producer before visiting the operation or entering any production or storage facility.

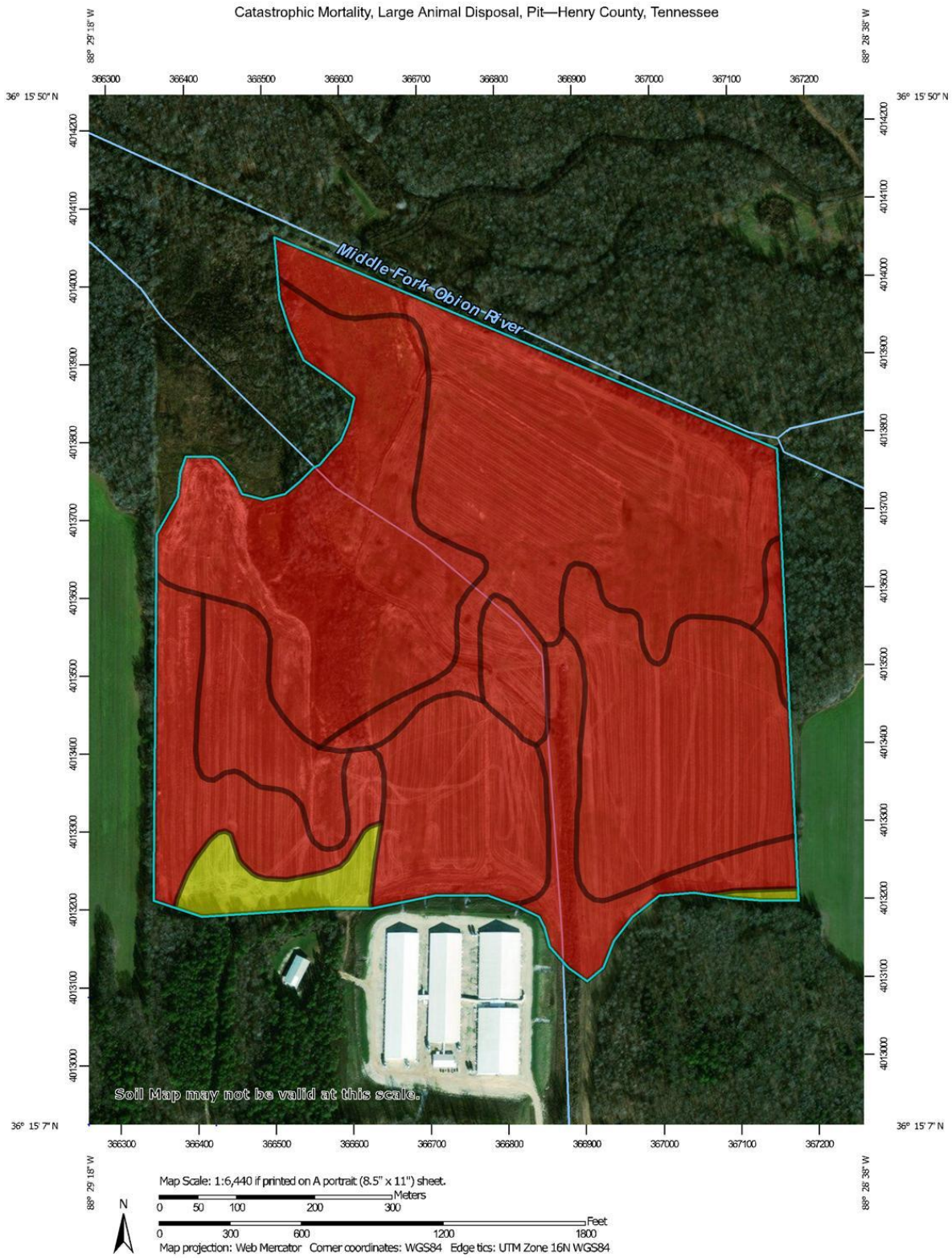
The following narrative describes how animal veterinary wastes (including medical equipment, empty containers, sharps and expired medications) will be managed at the operation.

Medicine will be disposed to as directed on label. Needles and other sharps will be put in to a sharps container. If any medicine is left it shall remain in the control rooms or in a building that is protected from outside environment and stored according to label.

Catastrophic Animal Mortality Management

Refer to NRCS standards, or state guidance, regarding appropriate catastrophic animal mortality handling methods.

Yellow areas are suitable for burial. Another option is Griffin Industries in Union City, Tn.



USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

12/28/2017
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Catastrophic Mortality, Large Animal Disposal, Pit

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Ao	Arkabutla-Rosebloom complex, 0 to 2 percent slopes, frequently flooded	Very limited	Arkabutla (57%)	Flooding (1.00)	30.7	22.4%
				Wetness (1.00)		
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
			Rosebloom (43%)	Flooding (1.00)		
				Wetness (1.00)		
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
Cn	Chenneby silt loam, 0 to 2 percent slopes, occasionally flooded	Very limited	Chenneby (93%)	Flooding (1.00)	34.2	25.0%
				Wetness (1.00)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
			Rosebloom (7%)	Flooding (1.00)		
				Wetness (1.00)		
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
CVA	Chenneby, Enville, and Arkabutla soils, 0 to 2 percent slopes, frequently flooded	Very limited	Chenneby (45%)	Flooding (1.00)	38.0	27.8%
				Wetness (1.00)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
			Enville (30%)	Flooding (1.00)		
				Wetness (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Seepage (0.52)		
				Sand content (0.32)		
				Unstable excavation walls (0.15)		
			Arkabutla (20%)	Flooding (1.00)		
				Wetness (1.00)		
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
			Rosebloom (5%)	Flooding (1.00)		
				Wetness (1.00)		
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
Ea	Enville silt loam, 0 to 2 percent slopes, occasionally flooded	Very limited	Enville (93%)	Flooding (1.00)	10.7	7.8%
				Wetness (1.00)		
				Seepage (0.52)		
				Sand content (0.32)		
				Unstable excavation walls (0.15)		
			Bibb (7%)	Flooding (1.00)		
				Wetness (1.00)		
				Seepage (0.50)		
				Water gathering surface (0.33)		
				Unstable excavation walls (0.01)		
Ik	Iuka loam, 0 to 2 percent slopes, occasionally flooded	Very limited	Iuka (89%)	Flooding (1.00)	18.9	13.8%
				Wetness (1.00)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Ok	Ochlockonee fine sandy loam, 0 to 3 percent slopes, rarely flooded	Somewhat limited	Ochlockonee (100%)	Seepage (0.50)	4.4	3.2%
				Flooding (0.40)		
				Unstable excavation walls (0.01)		
				Dusty (0.01)		
Totals for Area of Interest					**136.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	132.5	96.8%
Somewhat limited	4.4	3.2%
Totals for Area of Interest	**136.9**	**100.0%**

Description

"Catastrophic mortality, large animal disposal, pit," is a method of disposing of dead animals by placing the carcasses in successive layers in an excavated pit. The carcasses are spread, compacted, and covered daily with a thin layer of soil that is excavated from the pit. When the pit is full, a final cover of soil material at least 2 feet thick is placed over the burial pit.

The interpretation is applicable to both heavily populated and sparsely populated areas. While some general observations may be made, onsite evaluation is required before the final site is selected. Improper site selection, design, or installation may cause contamination of ground water, seepage, and contamination of stream systems from surface drainage or floodwater. The risk of contamination can be reduced or eliminated by installing systems designed to eliminate or reduce the adverse effects of limiting soil properties. Ratings are for soils in their present condition. The present land use is not considered in the ratings.

Ratings are based on properties and qualities to the depth normally observed during soil mapping (approximately 6 or 7 feet). However, because pits may be as deep as 15 feet or more, geologic investigations are needed to determine the potential for pollution of ground water and to determine the design needed. These investigations, which are generally arranged by the pit developer, include examination of stratification, rock formations, and geologic conditions that might lead to the conducting of leachates to aquifers, wells, watercourses, and other water sources. The presence of hard, nonrippable bedrock, bedrock crevices, or highly permeable strata at or directly below the proposed pit bottom is undesirable because of the difficulty in excavation and the potential pollution of underground water.

Properties that influence the risk of pollution, ease of excavation, trafficability, and revegetation are major considerations. Soils that are flooded or have a water table within the depth of excavation present a potential pollution hazard and are difficult to excavate. Slope is an important consideration because it affects the work involved in road construction, the performance of the roads, and the control of surface water around the pit. It may also cause difficulty in constructing pits in which the pit bottom must be kept level and oriented to follow the contour of the land.

The ease with which the pit is dug and with which a soil can be used as daily and final cover is based largely on soil texture and consistence, which determine workability when the soil is dry and when it is wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and difficult to place as a uniformly thick cover over a layer of carcasses. The uppermost part of the final cover should be soil material that favors the growth of plants. It should not contain excess sodium or salts and should not be too acid. In comparison with other horizons, the surface layer in most soils has the best workability and the highest content of organic matter. Thus, it may be desirable to stockpile the surface layer for use in the final blanketing of the filled pit area.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected of a properly designed and installed system. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of the individual limitations. The ratings are shown in decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

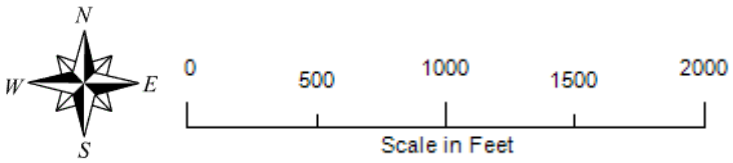
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

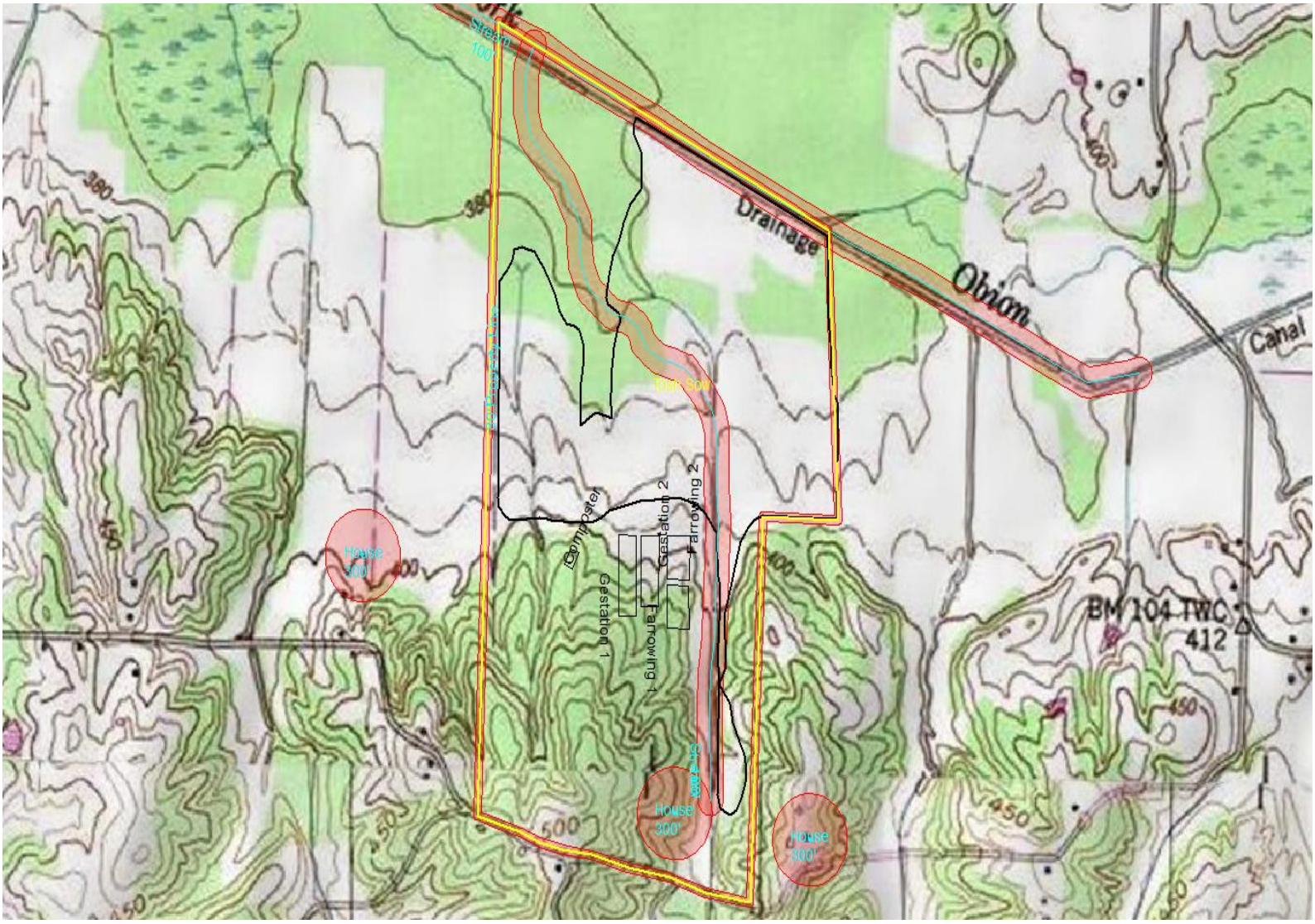
Section 2. Crop and Pasture (Land Treatment)

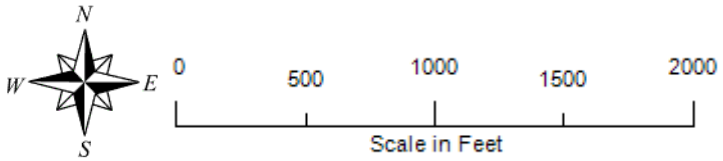
2.1. Maps of Fields, Soils, Application Setbacks, Existing and Planned Crop and Pasture Conservation Practices

Arial Map

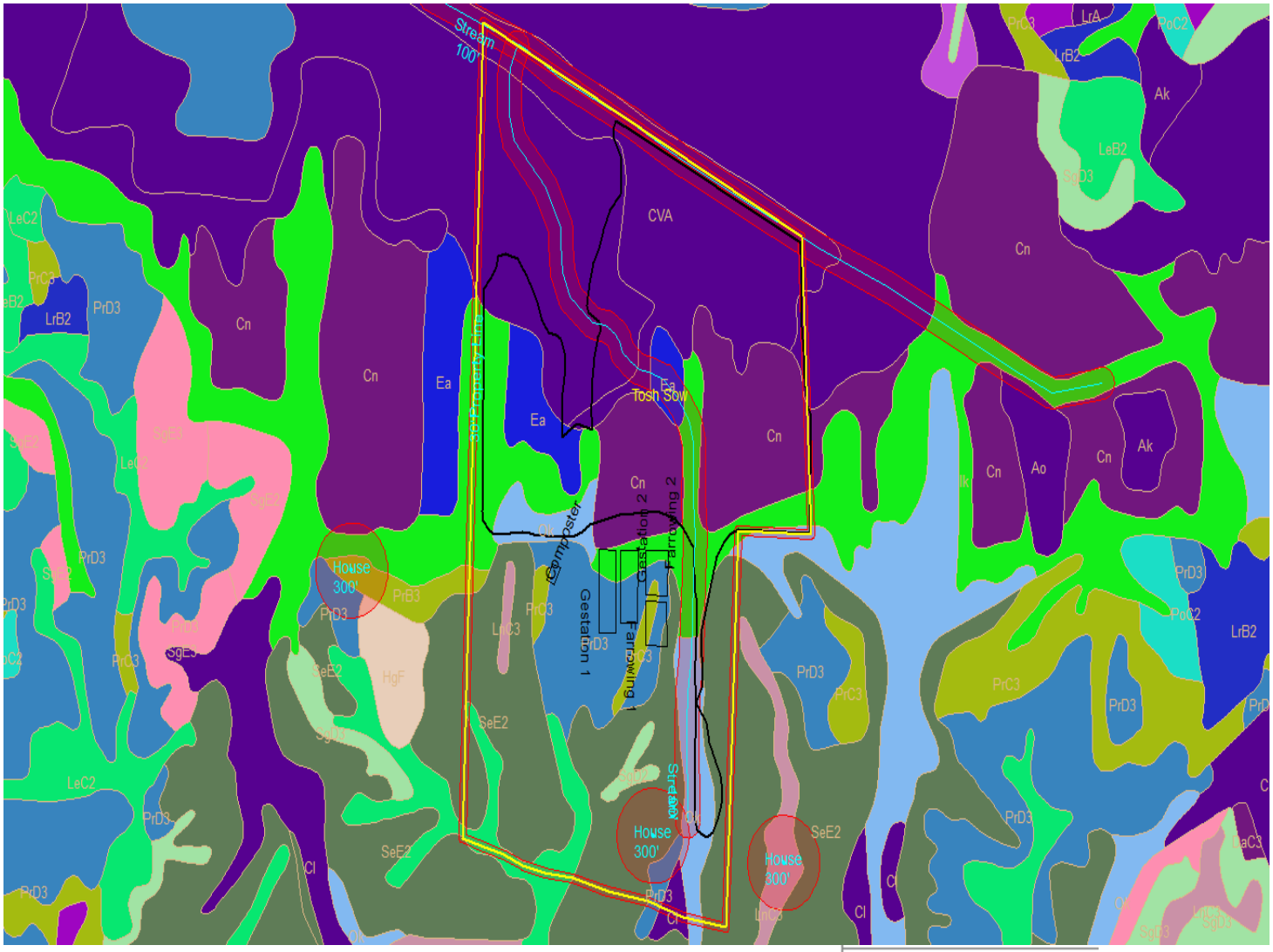


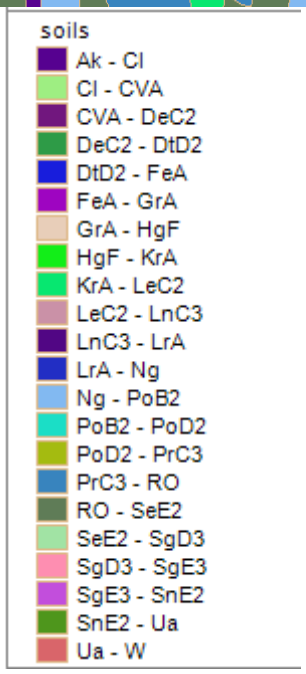
Topo Map

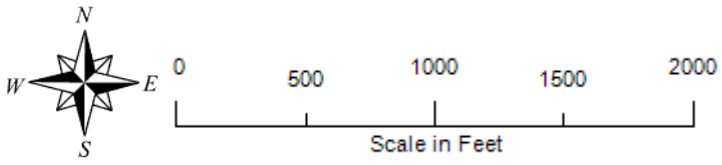

Stream
100'
Drainage
Obion
Canal
Tank 300'
Composter
Gestation 2
Farrowing 2
Gestation 1
Farrowing 1
Duck Pond
House
300'
House
300'
House
300'
BM 104 TWC
412
380
400
450
500


N
W
E
S
0
500
1000
1500
2000
Scale in Feet

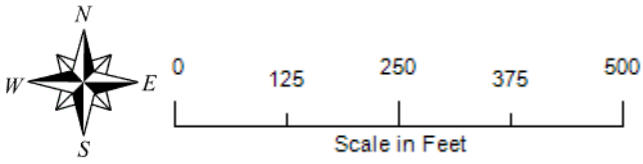
Soil Map

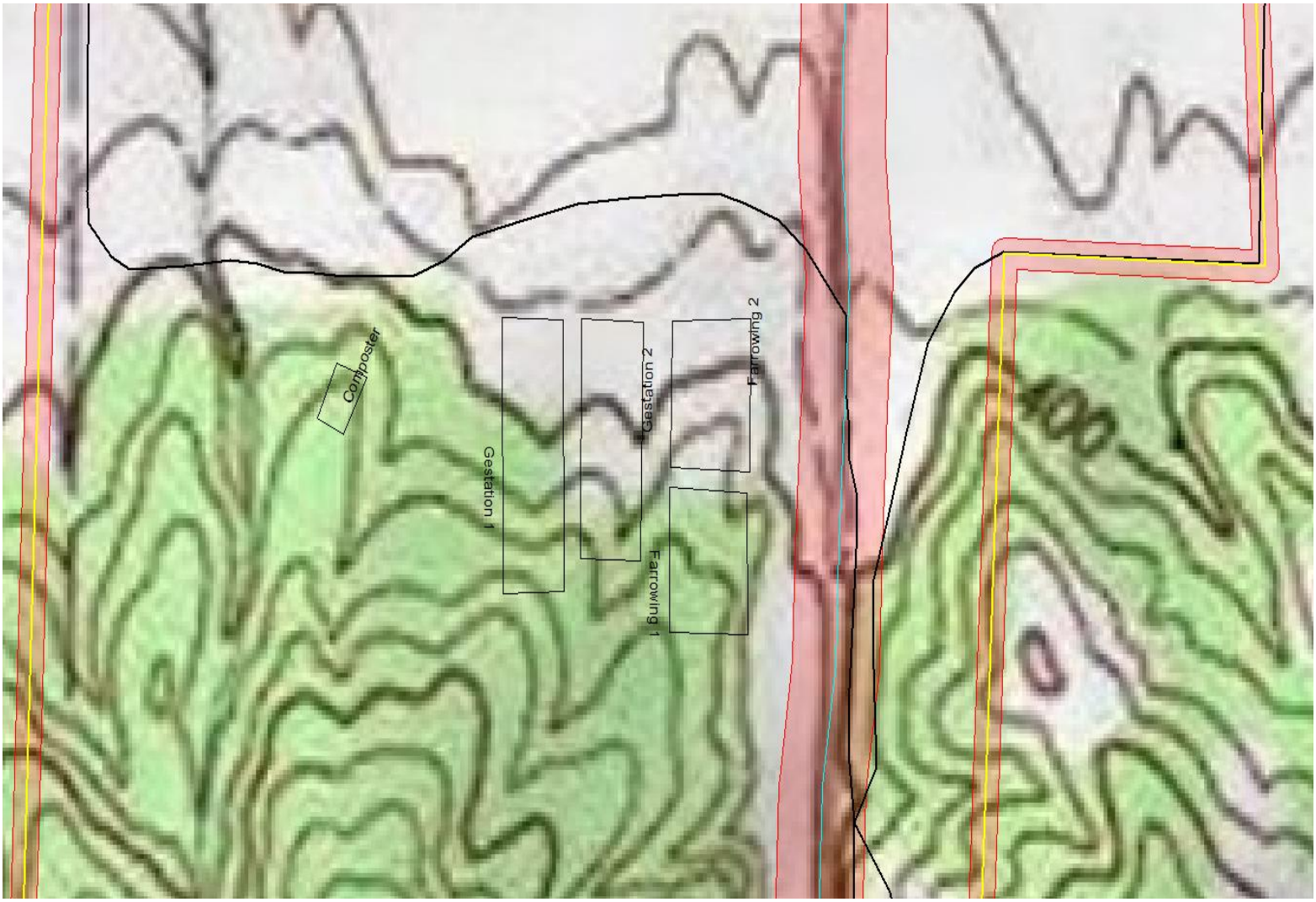

Stream
100'
CVA
Cn
Ea
Fa
Tosh Sow
Gestation 1
Gestation 2
Farrowing 1
Farrowing 2
Compost
House
300'
Surface Drain
LeC2
PrD3
LrB2
Ak
Ao
PrC3
LnC3
SeE2
HgF
Cl
LeB2
PoC2
LrA

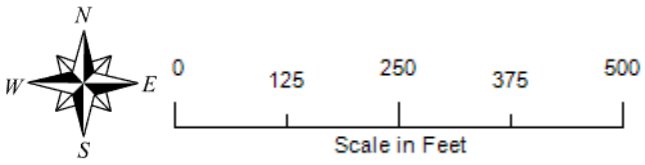

soils
Ak - Cl
Cl - CVA
CVA - DeC2
DeC2 - DtD2
DtD2 - FeA
FeA - GrA
GrA - HgF
HgF - KrA
KrA - LeC2
LeC2 - LnC3
LnC3 - LrA
LrA - Ng
Ng - PoB2
PoB2 - PoD2
PoD2 - PrC3
PrC3 - RO
RO - SeE2
SeE2 - SgD3
SgD3 - SgE3
SgE3 - SnE2
SnE2 - Ua
Ua - W


N
W
E
S
0
500
1000
1500
2000
Scale in Feet

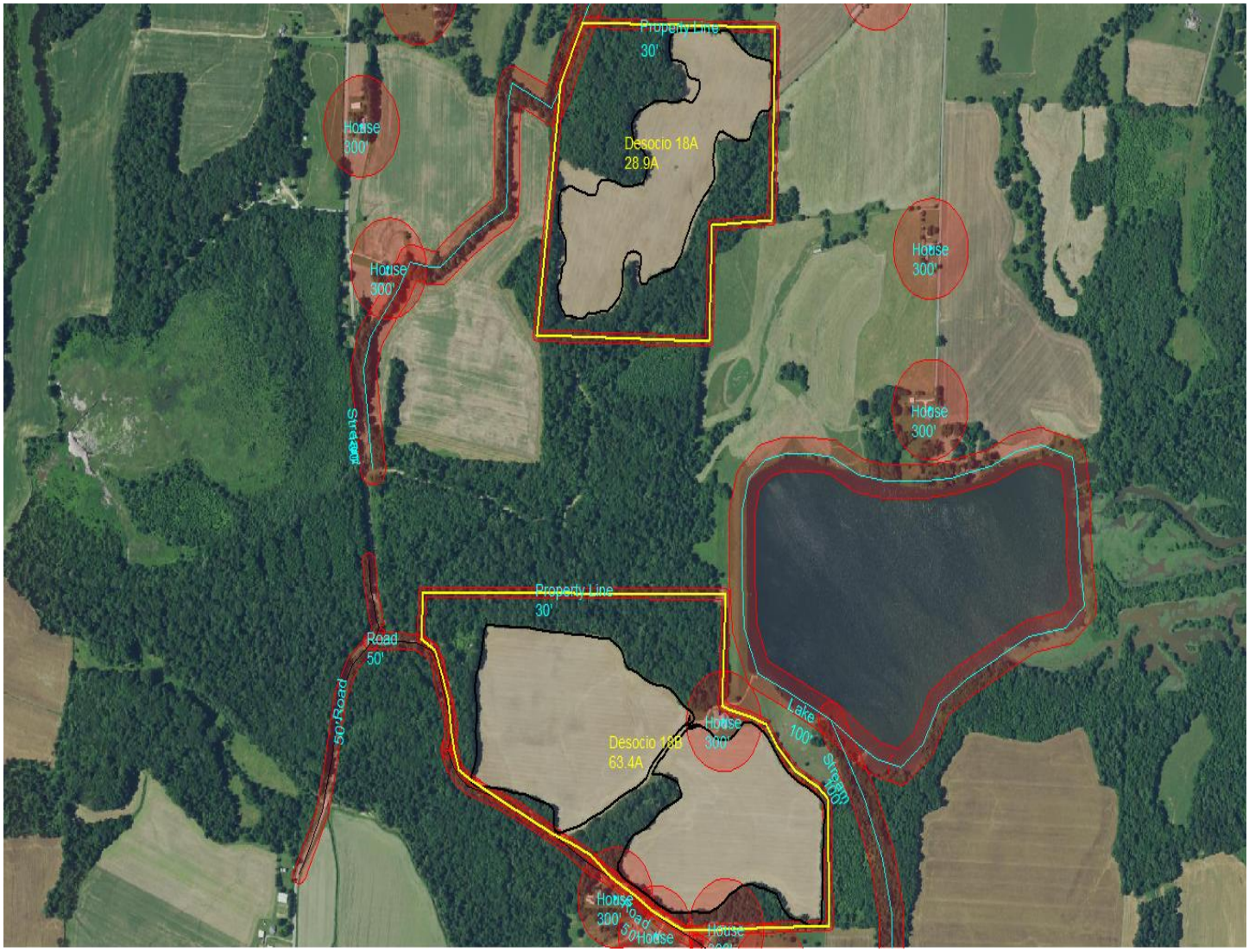
Production Area

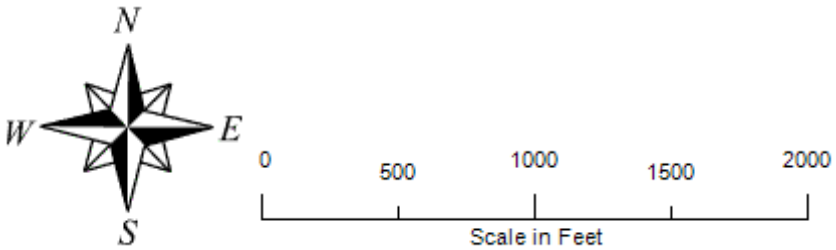



Composter
Gestation 1
Gestation 2
Farrowing 1
Farrowing 2

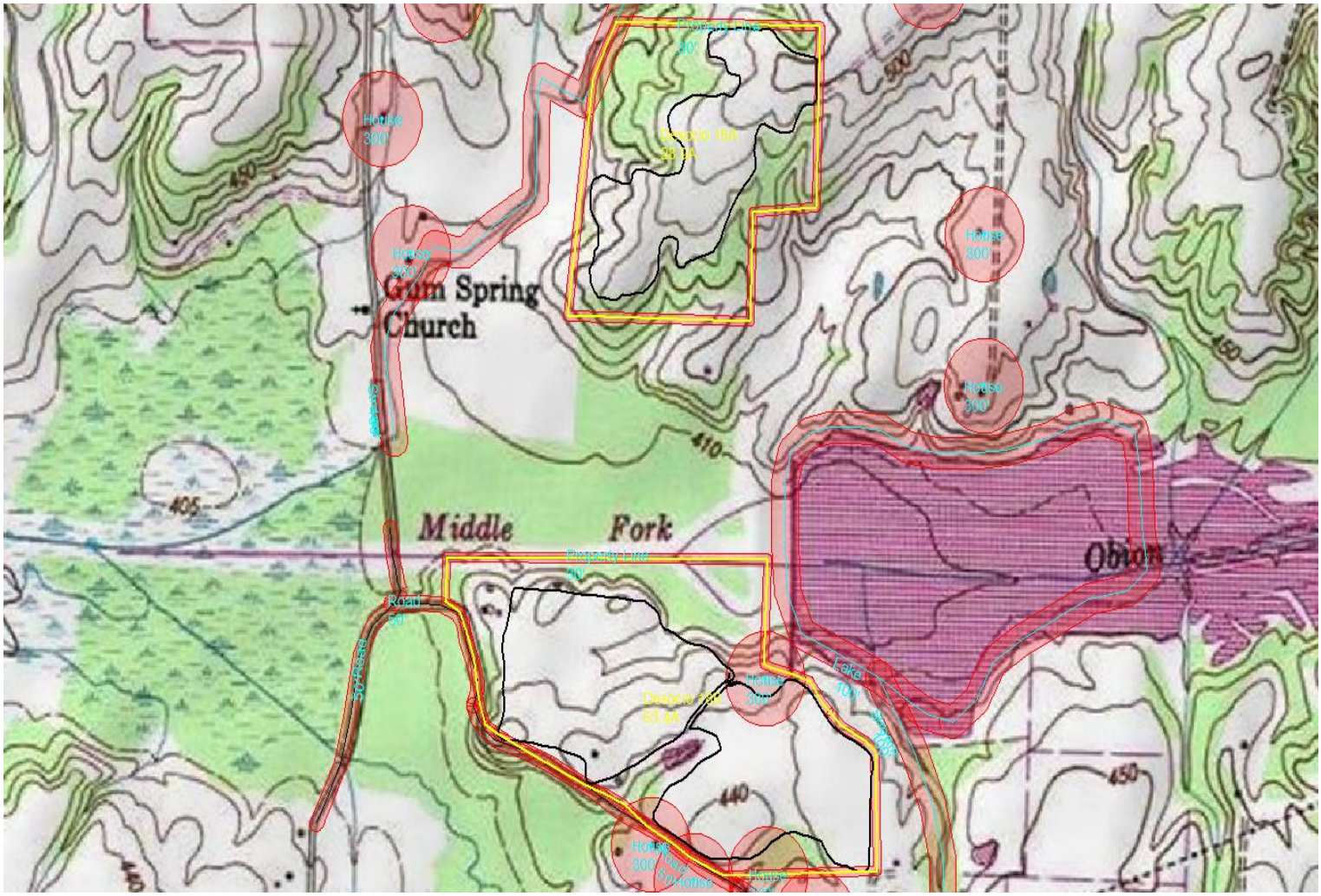

N
W
E
S
0
125
250
375
500
Scale in Feet

Arial Map


Property Line
30'
Desocio 18A
28.9A
House
300'
House
300'
House
300'
House
300'
Stream
Property Line
30'
Road
50'
50' Road
Desocio 18B
63.4A
House
300'
Lake
100'
Stream
100'
House
300'
Road
50'
House

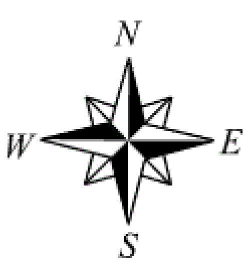

N
W
E
S
0
500
1000
1500
2000
Scale in Feet

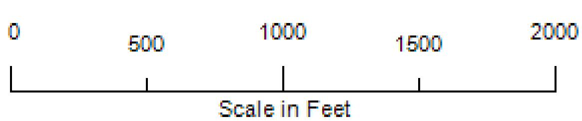
Topo Map


Property Line
30'
Pasture 18A
35.1A
House
300'
Gum Spring
Church
Middle
Fork
Obion
Road
50'
Lake
70'
Pasture 13A
63.4A
N
W
E
S
0
500
1000
1500
2000
Scale in Feet

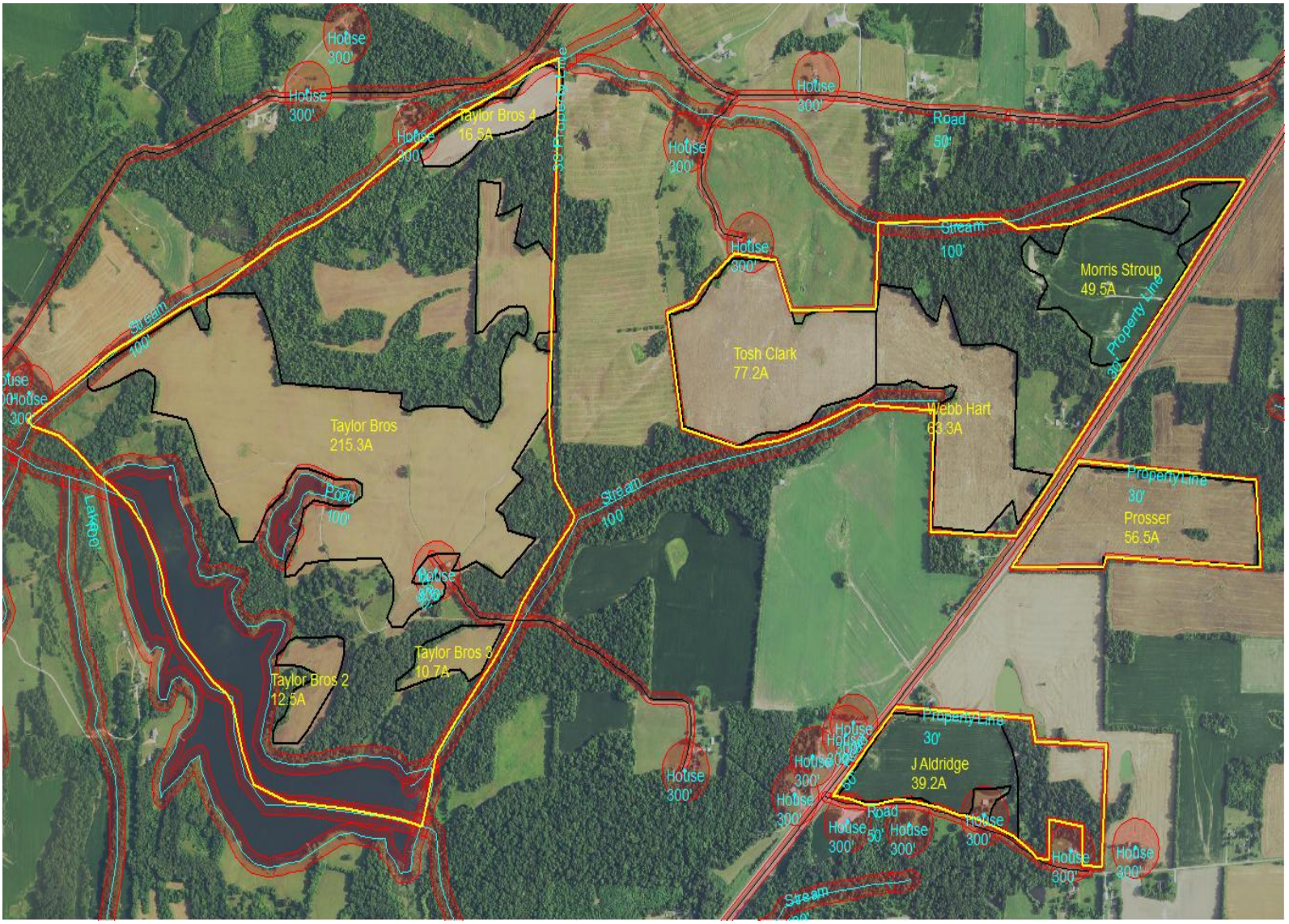
Soil Types

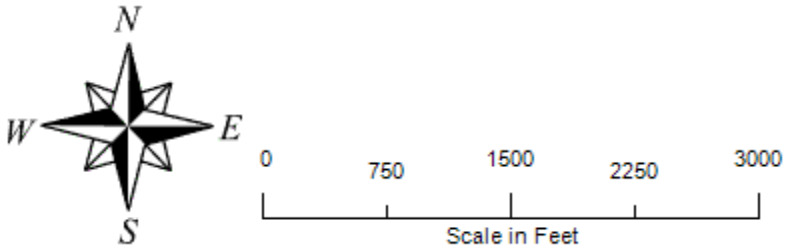
soils
- Ak - CaB2
- CaB2 - Cn
- Cn - DaC3
- DaC3 - Ea
- Ea - FeB2
- FeB2 - GrB2
- GrB2 - Ik
- Ik - LeB2
- LeB2 - LeD2
- LeD2 - LnC3
- LnC3 - LrA
- LrA - Ng
- Ng - PoB2
- PoB2 - PoD2
- PoD2 - PrC3
- PrC3 - RO
- RO - RuA
- RuA - SeD3
- SeD3 - SgD2
- SgD2 - SgE2
- SgE2 - STF
- STF - Ur
- Ur - W



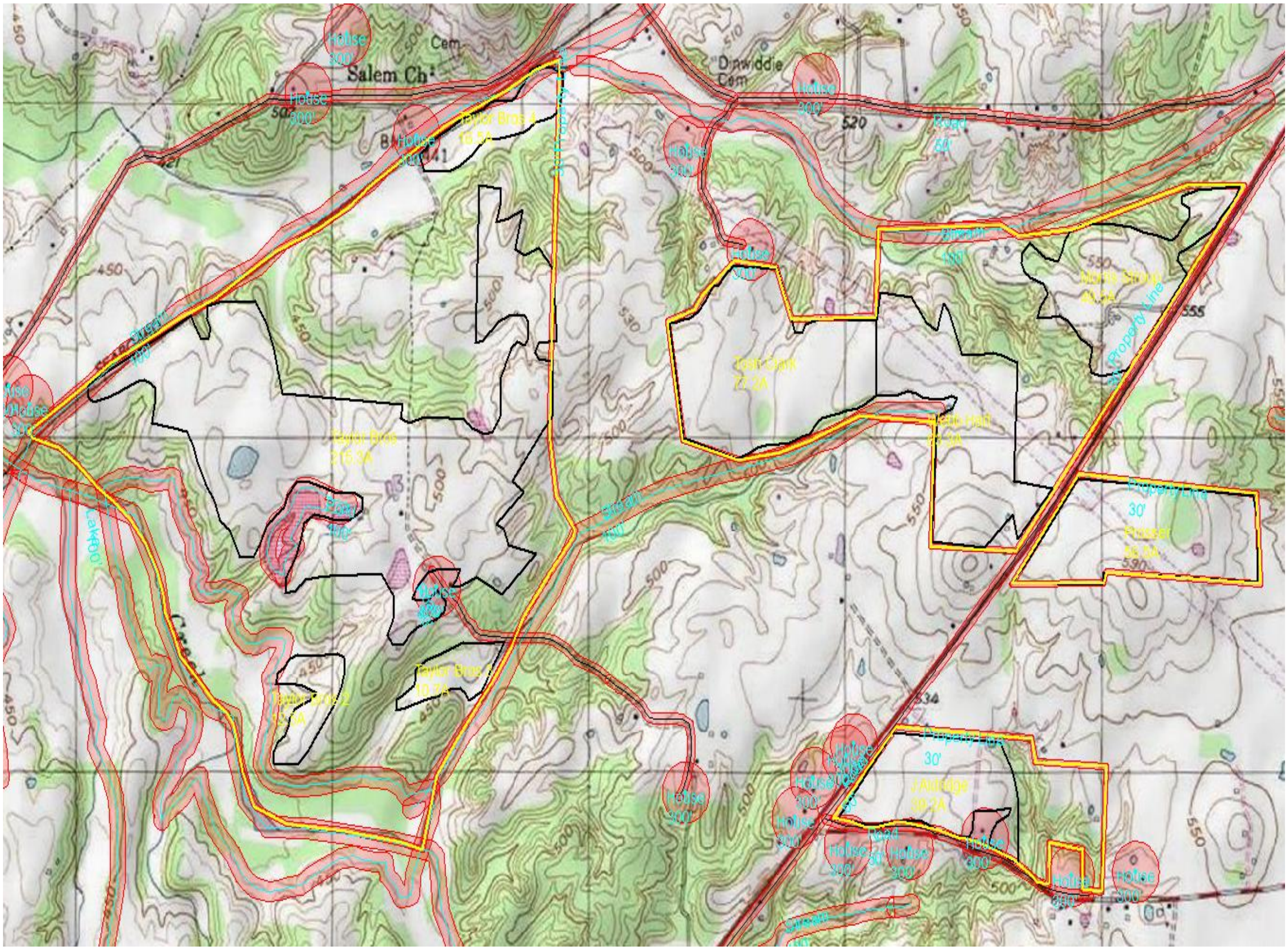


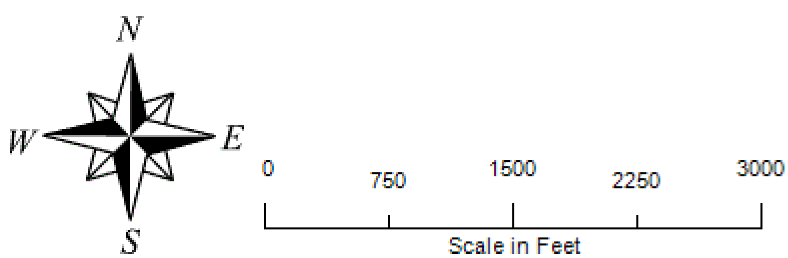
Arial Map


House 300'
House 300'
Taylor Bros 4 16.5A
House 300'
30' Property Line
House 300'
Road 50'
House 300'
Stream 100'
House 300'
Morris Stroup 49.5A
Property Line 30'
Stream 100'
Tosh Clark 77.2A
Webb Hart 63.3A
Taylor Bros 215.3A
Pond 100'
Lake 100'
Stream 100'
Property Line 30'
Prosser 56.5A
House 300'
Taylor Bros 3 10.7A
Taylor Bros 2 12.5A
House 300'
Property Line 30'
J Aldridge 39.2A
House 300'
House 300'
Road 50'
House 300'
House 300'
House 300'
House 300'
Stream

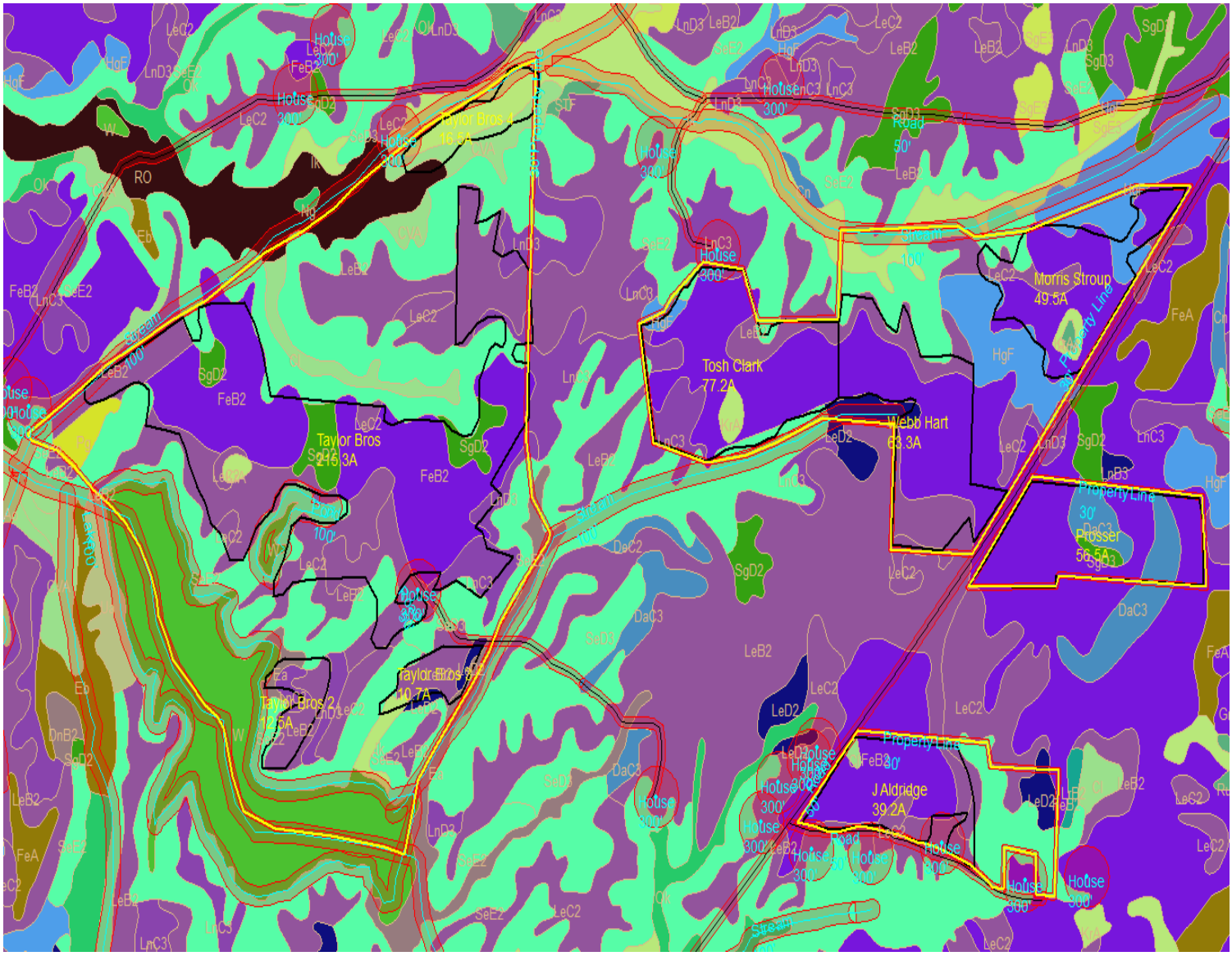

N
W
E
S
0
750
1500
2250
3000
Scale in Feet

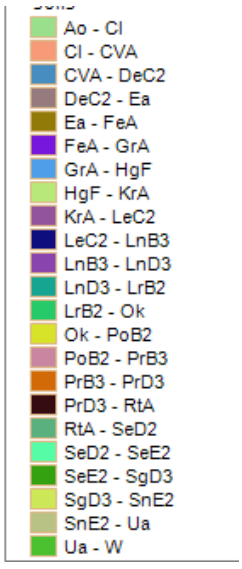
Topo Map

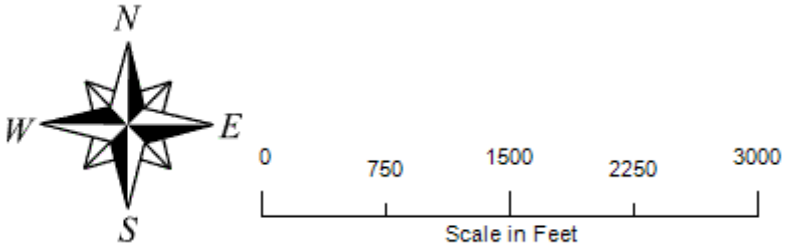

Salem Ch
Cem
Dinwiddie
Cem


N
W
E
S
0
750
1500
2250
3000
Scale in Feet

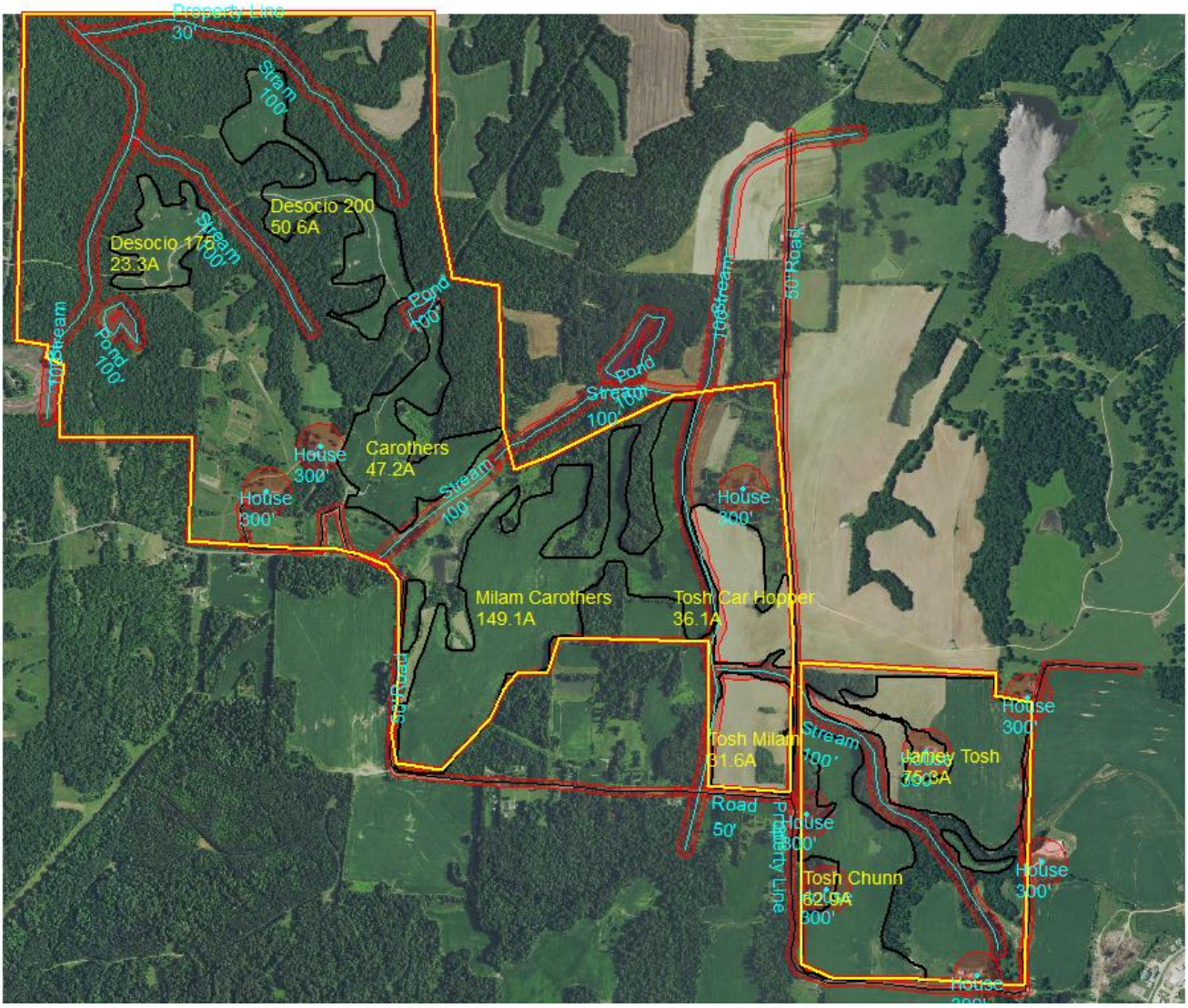
Soil Types

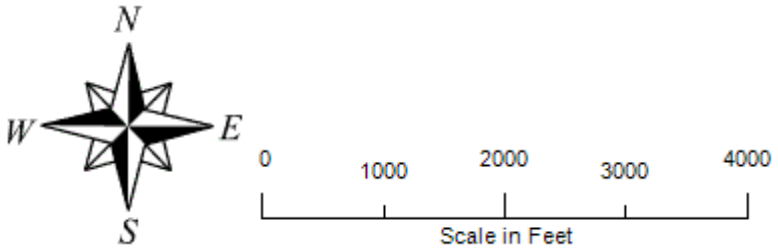

Morris Stroup
49.5A
Tosh Clark
77.2A
Webb Hart
63.3A
Taylor Bros
216.3A
Prosser
56.5A
J Aldridge
39.2A
Property Line
Stream
Road
House


Ao - Cl
Cl - CVA
CVA - DeC2
DeC2 - Ea
Ea - FeA
FeA - GrA
GrA - HgF
HgF - KrA
KrA - LeC2
LeC2 - LnB3
LnB3 - LnD3
LnD3 - LrB2
LrB2 - Ok
Ok - PoB2
PoB2 - PrB3
PrB3 - PrD3
PrD3 - RtA
RtA - SeD2
SeD2 - SeE2
SeE2 - SgD3
SgD3 - SnE2
SnE2 - Ua
Ua - W

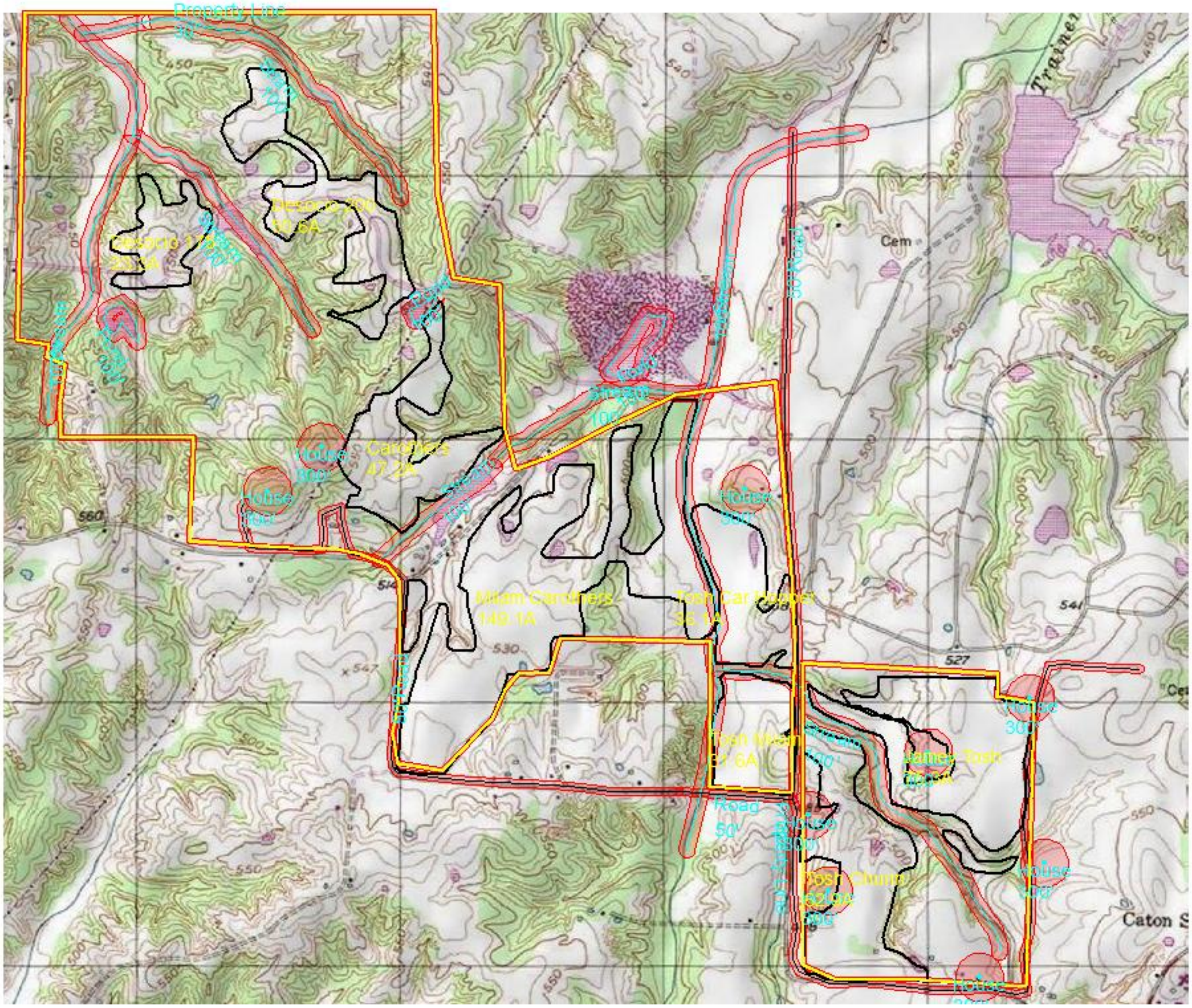

N
W
E
S
0
750
1500
2250
3000
Scale in Feet

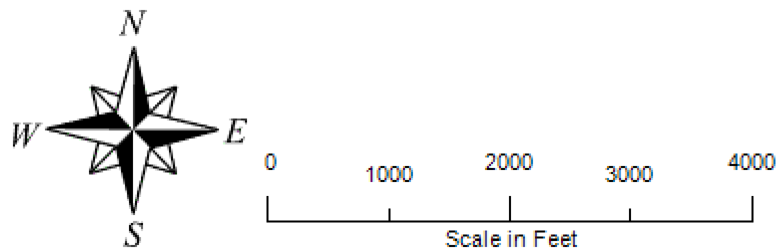
Arial Map


Property Line
30'
Stream
100'
Desocio 200
50.6A
Desocio 175
23.3A
Stream
100'
Stream
100'
Pond
100'
Pond
100'
Stream
100'
Pond
100'
Stream
100'
Stream
100'
50' Road
House
300'
Carothers
47.2A
House
300'
House
300'
Milam Carothers
149.1A
Tosh Car Hopper
36.1A
30' Road
Tosh Milam
31.6A
Stream
100'
Jamey Tosh
75.3A
House
300'
Road
50'
Property Line
House
300'
Tosh Chunn
62.9A
300'
House
300'
House

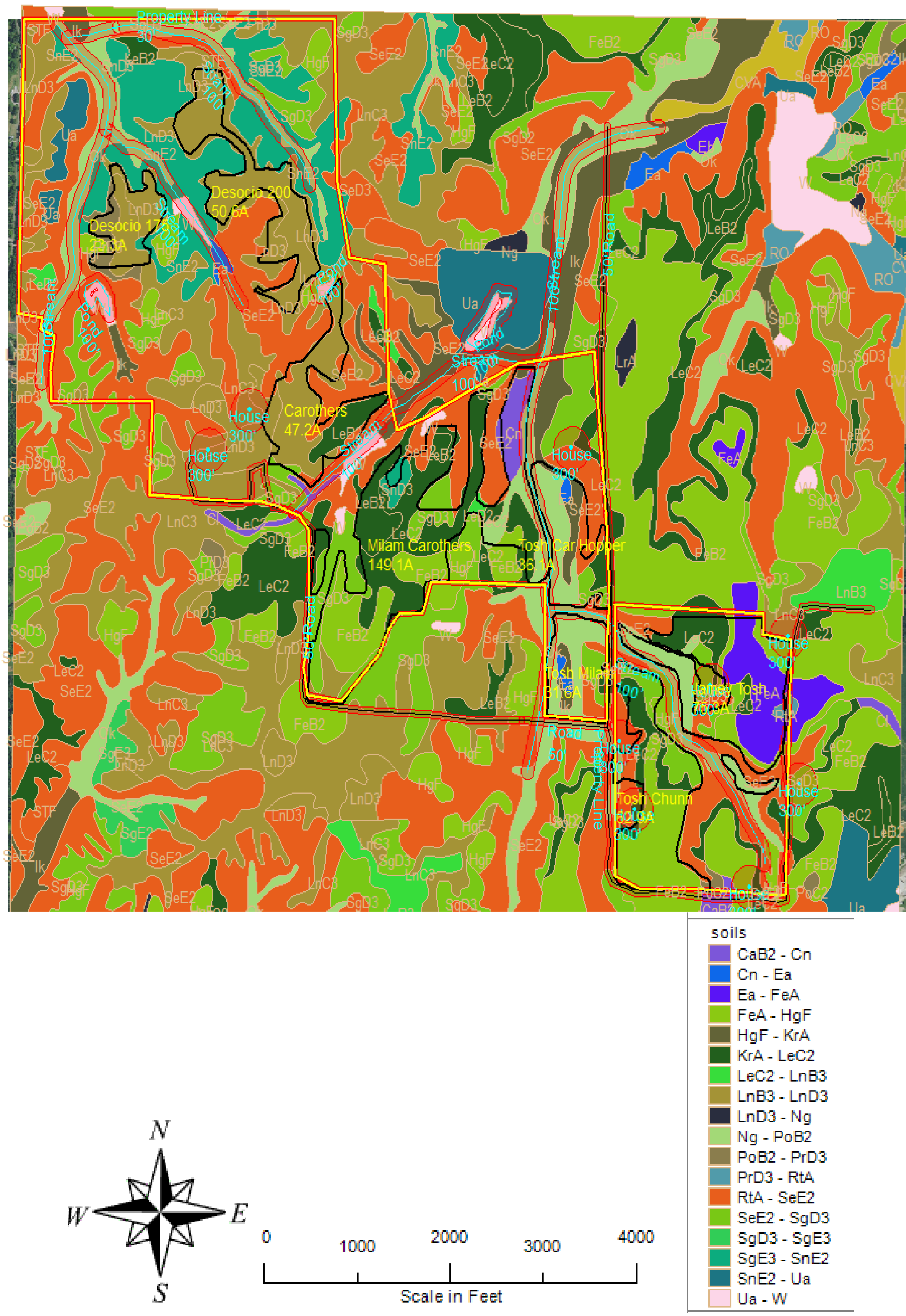

N
W
E
S
0
1000
2000
3000
4000
Scale in Feet

Topo Map


Property Line
Cem
Caton S
527
541
560
547
530
550

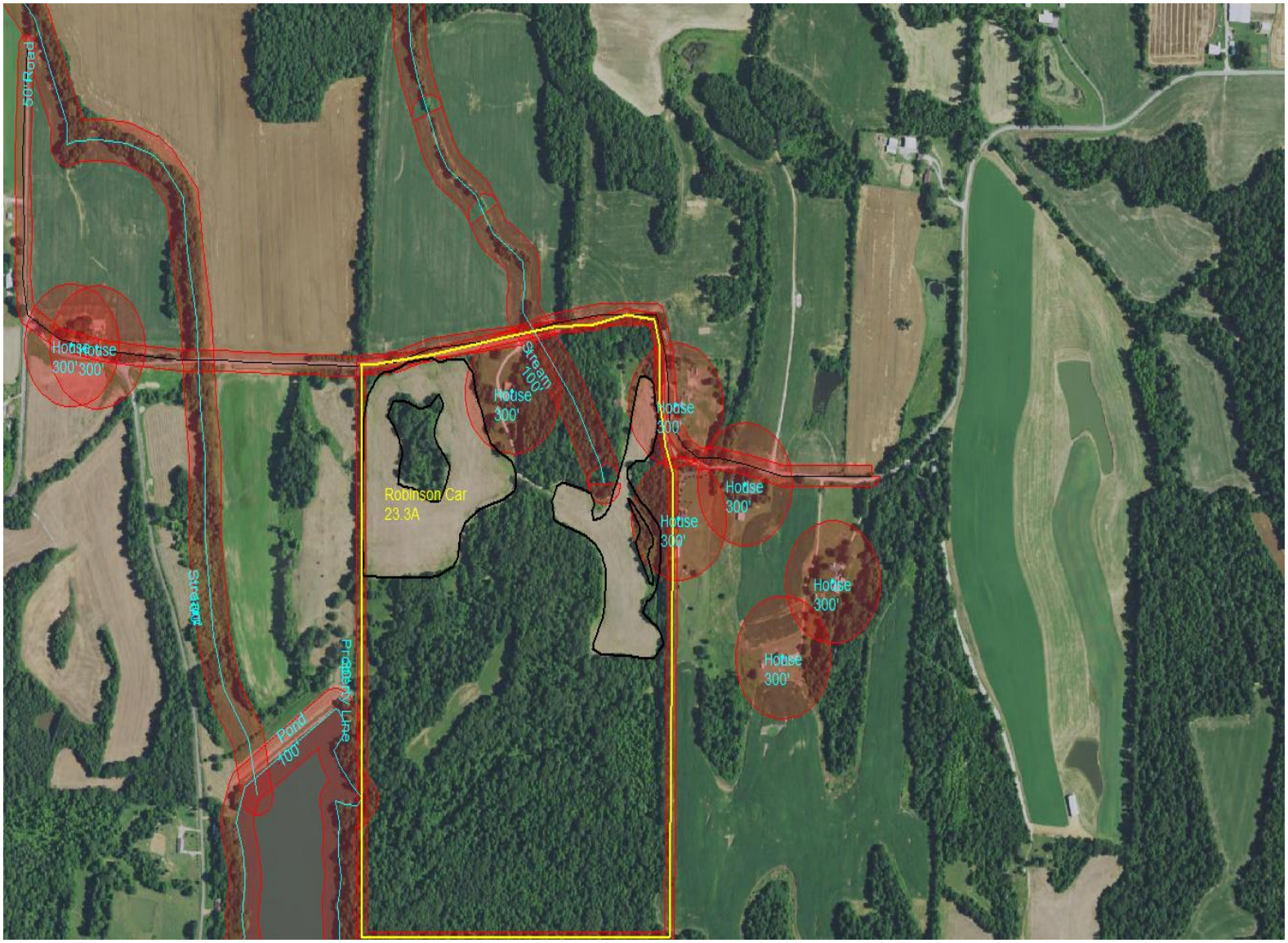

N
W
E
S
0
1000
2000
3000
4000
Scale in Feet

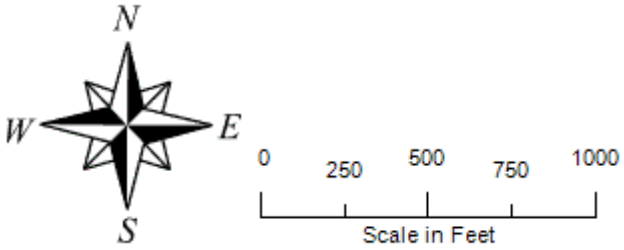
Soil Types



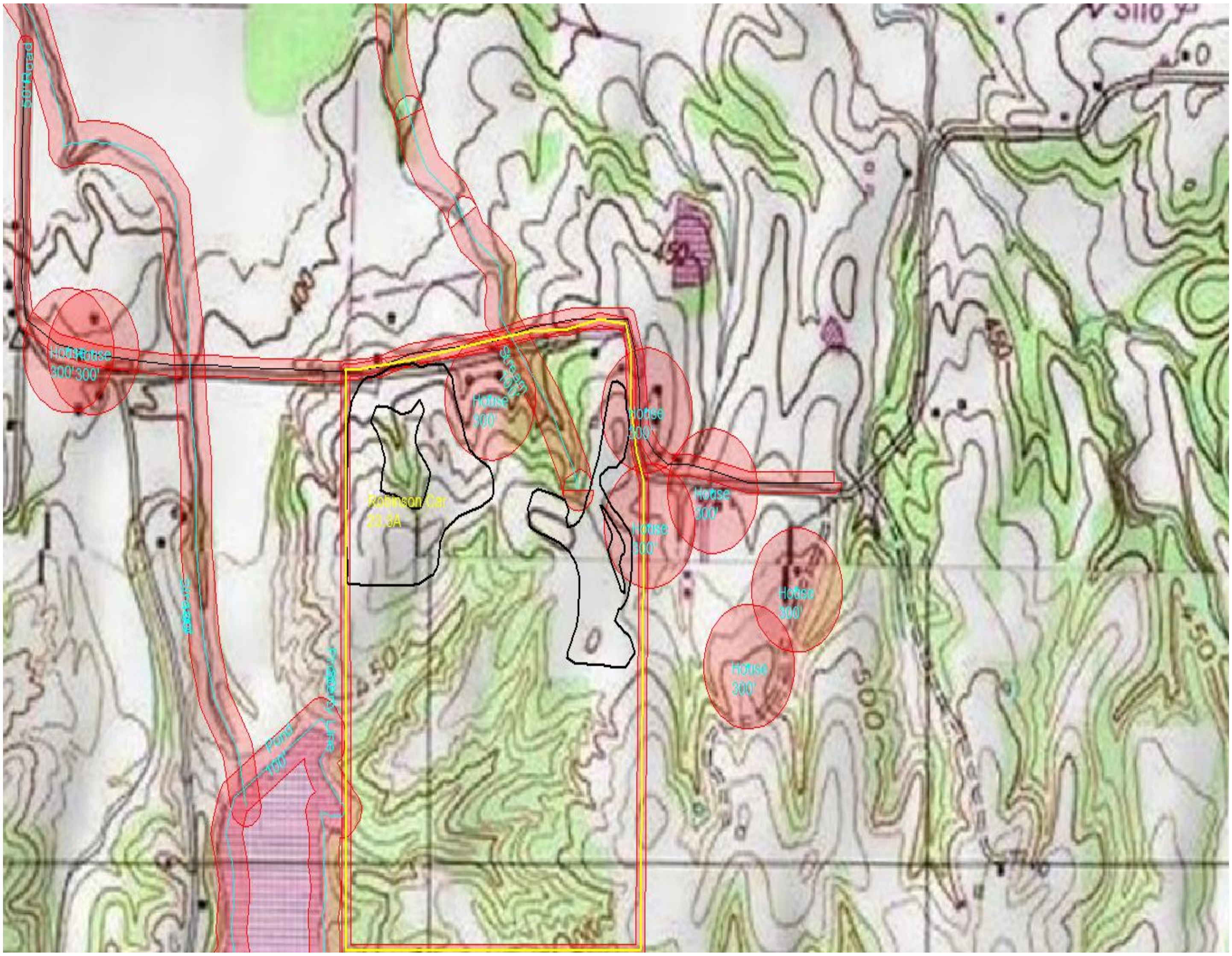
soils
CaB2 - Cn
Cn - Ea
Ea - FeA
FeA - HgF
HgF - KrA
KrA - LeC2
LeC2 - LnB3
LnB3 - LnD3
LnD3 - Ng
Ng - PoB2
PoB2 - PrD3
PrD3 - RtA
RtA - SeE2
SeE2 - SgD3
SgD3 - SgE3
SgE3 - SnE2
SnE2 - Ua
Ua - W
N
S
W
E
0
1000
2000
3000
4000
Scale in Feet

Arial Map

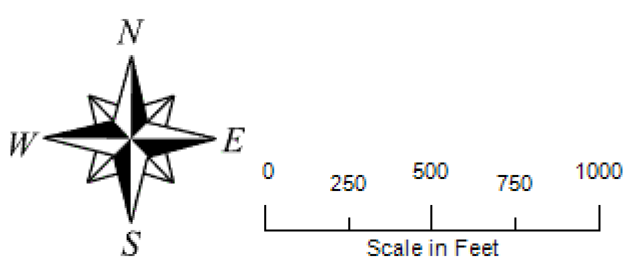

50' Road
House 300'
House 300'
Stream 100'
House 300'
House 300'
House 300'
House 300'
House 300'
House 300'
Robinson Car 23.3A
Stream
Property Line
Pond 100'


N
W
E
S
0
250
500
750
1000
Scale in Feet

Topo Map

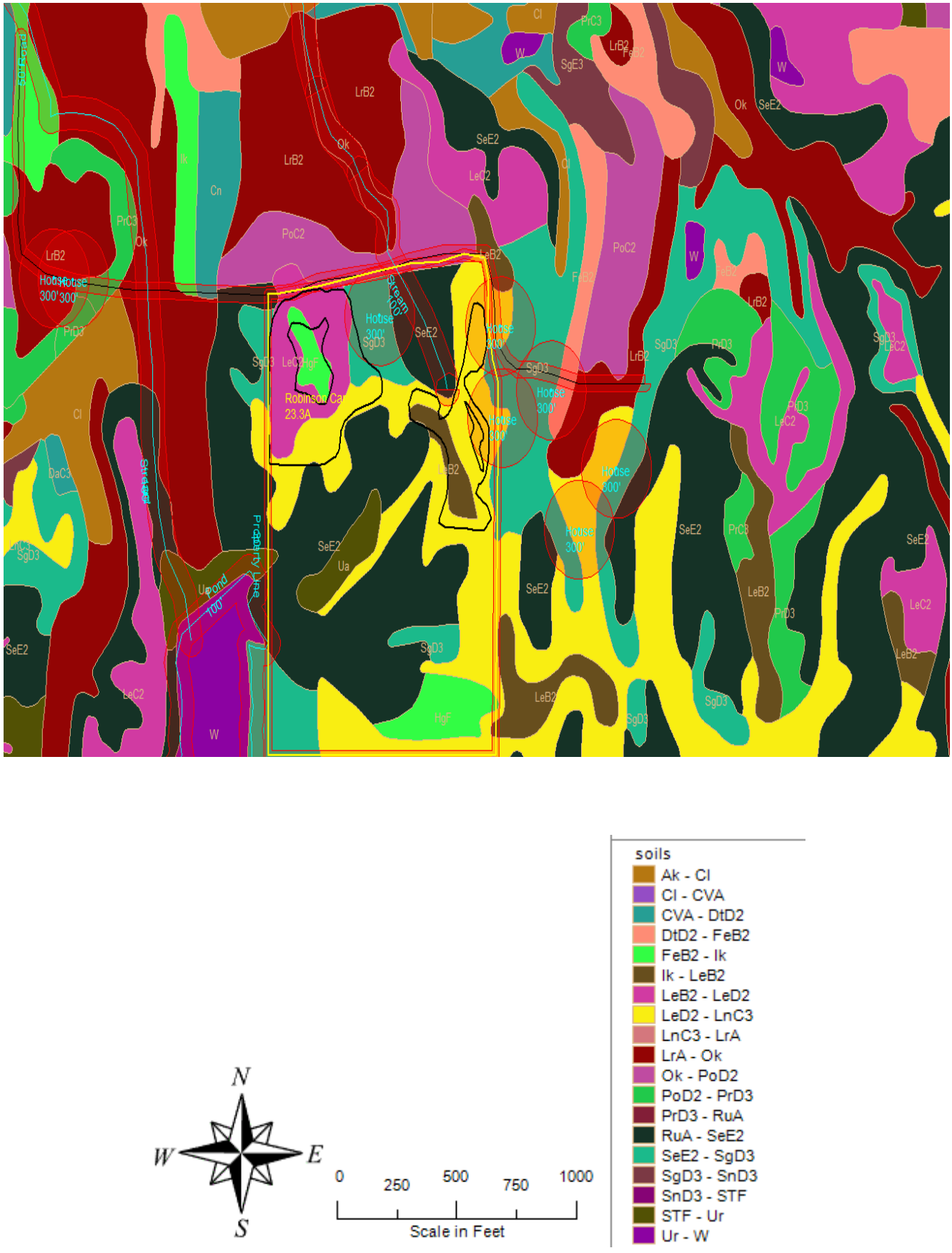


Robinson Car
23.3A
House
300'
Pond
100'



N
W
E
S
0
250
500
750
1000
Scale in Feet

Soil Types


soils
Ak - Cl
Cl - CVA
CVA - DtD2
DtD2 - FeB2
FeB2 - Ik
Ik - LeB2
LeB2 - LeD2
LeD2 - LnC3
LnC3 - LrA
LrA - Ok
Ok - PoD2
PoD2 - PrD3
PrD3 - RuA
RuA - SeE2
SeE2 - SgD3
SgD3 - SnD3
SnD3 - STF
STF - Ur
Ur - W
N
W
E
S
0
250
500
750
1000
Scale in Feet

2.2. Crop and Pasture Conservation Practices -- Record of Decisions

Conservation Crop Rotation (328)

Grow crops in a recurring sequence in the same field. Develop crop rotation program for Corn - Soybeans. See Practice Standard 328.

Field(s)	Planned amount (Ac)	Month	Year	Amount Applied	Date
All Fields in Plan	**1173.9**	6	2017		
Total	**1173.9**	**6**	**2017**		

Nutrient Management (590)

Soil amendments, animal waste, and lime will be applied according to soil test recommendations. When applying animal waste, recommended buffer widths shall be observed. Refer to Practice Standard 590.

Ongoing: Use of rotation, application of manure and commercial fertilizer/ lime according to soil test results from a Tn accredited lab.

Manure needs to be tested each time an application occurs if manure test varies from this document, make adjustments to application rate.

Field(s)	Planned amount (Ac)	Month	Year	Amount Applied	Date
All Fields in Plan	**1173.9**	6	2017		
Total	**1173.9**	**6**	**2017**		

All NRCS conservation practices shall be installed, operated and maintained according to NRCS conservation practice standards and associated technical specifications.

2.3. Crop and Pasture Conservation Practices – Implementation Requirements

Sampling Farm Fields

Divide fields to be sampled into production areas (of 10 acres or less) based on uniform soil type, fertilization and management history. Sandy or eroded areas, and problem areas of obviously different plant growth responses should also be sampled separately -- provided the area is sufficiently large enough to be treated differently with lime or fertilizer.

From your local county Extension office, obtain a soil sample box for **each** production area, and submit a Soil and Media Test Information Sheet,* for each **ten** production areas.

For each production area that you have identified:

1. Collect a composite soil sample by moving through the area in a zig-zag pattern; sampling at a minimum of 20 locations. This sampling procedure should be random with respect to any existing cropping row. In continuous no-till production fields, be sure to vary distance from the row for each sub-sample collected. In continuous no-till fields or where fertilizer has been banded, increasing the number of sub-samples to 30 or 40 will increase precision of the results.

2. Move surface litter aside. Each sub-sample should be obtained by using a soil tube, trowel or spade. For determination of plant nutrients, take soil samples to a depth of 6 inches. For organic matter determination, sample to the depth of 2 inches.

3. Combine each sub-sample in a clean bucket as you move through the production area. Do not use a galvanized bucket if Zn is to be determined. Thoroughly mix the sub-samples into one composite sample. If the soil is exceptionally wet, you may have to let it air dry on a paper plate before it can be properly mixed (wet soil can also dramatically increase shipping costs and weaken shipping containers). DO NOT use heat to dry a soil sample as heat may change your results.

4. From this composite sample remove enough soil (about a cup) to fill a soil sample box. Adequately mark the box to identify the selected production area location represented by that soil sample and keep this record in a safe place for later referral.

5. For the PSNT soil test, sample to a depth of 12 inches when corn is 6 to 12 inches tall. Height should be measured from the ground to bottom of the whorl (4-6 fully mature leaves present).

6. For container media analysis, medium should be sampled before posting by removing several portions from the mix and blending thoroughly. For established plantings, select 8 to 10 pots that are representative of the medium used. Scrape away the top one-fourth inch of each pot including slow-release fertilizer pellets and discard. Mix samples being careful not to crush any remaining fertilizer pellets. Completely fill **two** soil sample boxes for container media analysis.

Send soil sample(s), Soil and Media Information Sheet(s), and appropriate fees to the Soil, Plant and Pest Center (see address and fee information on the Soil and Media Information Sheet). Fees can also be paid by credit card using the secure UT Institute of Agriculture eMarketplace site. Click here to pay online.

THE UNIVERSITY of TENNESSEE Extension
W093

Livestock Waste Management and Conservation

Procedures for Manure and Litter Sampling

(Class I & II – Large and Medium CAFOs)

Tennessee CAFO Factsheet #14

Kristy M. Hill, Extension Dairy Specialist
Animal Science Department

Nutrient composition of manure varies with a number of factors, including animal type, bedding, ration, storage and handling, environmental conditions, field application method, age of manure, timing of sampling and sampling technique. This variability makes book values (or averages) an unreliable source for determining application rates of nitrogen, phosphorus and potassium. Each livestock production operation and manure management system is unique, and an individual farm's manure analysis can vary from average values by 50 percent or more. Testing manure may better indicate how animal management and other factors actually affect nutrient contents and will allow for more accurate calculation of application rates.

The results of a manure analysis are only as reliable as the sample taken. A representative sample is needed to accurately reflect the nutrient content. However, obtaining a representative sample can be a challenge as manure nutrient content is not uniform within storage structures. Mixing and sampling strategies can insure that samples more accurately reflect the type of manure that will be applied.

When to Sample

The ideal time to sample manure is prior to application to ensure that results of the analysis are received in time to adjust nutrient application rates.

However, do not allow long periods of time to pass before application begins, because there can be storage and handling losses over time. Sampling several days to a week prior to application is best. However, a complication of the timing of the sampling is that semi-solid (or slurry) manure should be well agitated before sampling, and in many situations, such as contracting waste application to a third party, agitators or other necessary equipment are not available until application begins. In cases such as this, "pre-sampling" (dipping samples off the top of the storage structure for N and K concentrations) can be used to estimate application rates (See page 4 for more info on pre-sampling).

Building a "bank" of manure analysis over time can be quite useful in the future as long as animal management practices, feed rations or manure storage and handling methods do not drastically change from present methods. If samples do not vary greatly from year to year or are consistent during spring or fall applications, the "bank" averages will help estimate application rates if an analysis cannot be performed prior to application.

Safety Precautions

It is more dangerous and more difficult to sample from liquid storage facilities than dry-manure systems. Proper precautions should be taken to prevent

accidents, such as falling into the storage facility or being overcome by manure gases.

1. Have two people present at all times;
2. Never enter confined manure-storage spaces without appropriate safety gear, such as a self-contained breathing apparatus;
3. When agitating a storage pit below a building, be sure to provide adequate ventilation for both humans and animals; and
4. When agitating outdoor pits, monitor activities closely to prevent erosion of berms or destruction of pit liners.

Sample Preparations

1. Check with the laboratory performing the analysis, as most of these labs have plastic bottles available for liquid sample collection or sealable plastic bags for dry samples (freezer bags work well). Additionally, they may have specific sample collection procedures, including holding times, refrigeration and shipping requirements.
2. Do not use glass containers, as expansion of the gases in the sample can cause the container to break.
3. Never use galvanized containers for collection or mixing due to the risk of contamination from metals like zinc in the container.
4. When taking liquid samples from facilities spreading both effluent and solids, the manure should be agitated for two to four hours before taking the sample.
5. Liquid samples can be taken during agitation (after two to four hours have passed) because most agitation equipment is effective 75 to 100 feet away from the equipment.
6. Take multiple samples from the storage facility and mix them together thoroughly in a larger bucket to obtain a representative sample. For liquid or semi-solid samples, use a stirring rod to get the solids spinning in suspension and collect the representative sample while the liquid is still spinning.
7. When taking liquid samples, fill the plastic bottle three-fourths full and leave at least 1 inch of air space to allow for gas expansion.
8. When taking dry samples, squeeze all of the excess air from the sealable plastic bag to allow for gas expansion and place the first bag into a second sealable plastic bag to prevent leaks.
9. Label the plastic bags or bottles prior to sampling with your name, date and sample identification number. Use a waterproof pen.
10. After sampling, place the container(s) in the refrigerator or freezer (preferred) until mailed to the lab. Cooling the samples will reduce microbial activity, chemical reactions and reduce odors.
11. Ship samples early in the week (Monday–Wednesday) using an overnight service. Avoid holidays and weekends.

Sampling Semi-Solid and Liquid Manure from Storage Facilities

Manure with 10 to 20 percent solids is classified as semi-solid manure and can usually be handled as a liquid. Semi-solid manure usually requires the use of chopper pumps to provide thorough agitation before pumping. Liquid manure is manure with less than 10 percent solids and is handled with pumps, pipes, tank wagons or irrigation equipment (if less than 5 percent solids).

If all contents of the entire semi-solid or liquid storage facility will be applied, complete agitation (2-4 hours minimum) is required to accurately sample the manure because in liquid and semi-solid systems, settled solids can contain more than 90 percent of the phosphorus. However, if solids will be purposefully left on the bottom when the storage structure is pumped out, as is sometimes the case with lagoons, then complete agitation during sampling will generate artificially high nutrient values. In this case, agitation of the solids or sludge at the bottom of the lagoon is not needed for nutrient analysis, and premixing the surface liquid in the lagoon is not needed.

Methods of Sampling:

Several different methods may be used to sample liquid or semi-solid manure from storage facilities:

1. Use a plastic sampling cup with a 10- to 12-foot handle to obtain surface water samples (see Figure 1). Collect about a pint of sample from several locations (six to eight) around the perimeter of the storage unit about 6 feet from the bank and 12 inches below the surface. Avoid floating debris or scum. Pour each of the samples into a clean plastic bucket and mix well. Pour representative sample in plastic container for shipping. *(Chastain, 2003)*
2. Throw a small plastic bucket tied to a long rope out towards the middle of the storage unit while holding onto the rope. Begin pulling the bucket back to the bank as soon as it strikes the surface. Make sure the bucket is raised above the surface before it strikes the bank. Pour each sample into a larger plastic bucket, and repeat this procedure at four to six locations evenly spaced around the perimeter of the storage unit. Mix all samples well and pour representative sample into a plastic container for shipping. *(Chastain, 2003)*
3. Samples may also be taken using a probe or a tube. They can be constructed out of a 1½-inch diameter PVC pipe. Cut the PVC pipe a foot longer than the depth of the pit. Run a ¼-inch rod or string through the length of the pipe and attach a plug such as a rubber stopper or rubber ball (see Figure 2). The rod or the string must be longer than the pipe. If using a rod, bend the top over to prevent it from falling out of the pipe. The probe should be slowly inserted into the pit or lagoon with the stopper open, to the full depth of the pit. Pull the string or rod to close the bottom of the pipe and pull the probe out of the pit, being careful not to tip the pipe and dump the sample. Release the sample into a large plastic bucket and repeat the process at least three times around the pit. Mix all samples well and pour a representative sample into a plastic container for shipping. *(Rieck-Hinz, 2003)*

Figure 1.

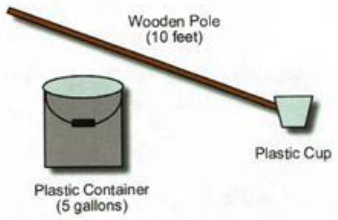


Figure 2.

Sampling Semi-Solid and Liquid Manure during Land Application with Tank Wagons

Settling begins as soon as agitation stops, so samples should be collected as soon as possible after the manure tank wagon is filled, unless the tanker has an agitator. Be sure the port or opening does not have a solids accumulation from prior loads. Collect samples in a plastic bucket from the loading or unloading port or the opening near the bottom of the tank. Stir the sample in the bucket to get the solids in suspension. Remove a ladle full while the liquid is still spinning and pour into the sample bottle. Repeat these steps until the sample bottle is three quarters full.

Sampling Liquid Manure during Land Application with Irrigation Systems

Place plastic buckets randomly at different distances from the sprinkler head in the field to collect the liquid manure that is being applied by an irrigation system. Immediately after manure has been applied, collect manure from the buckets and combine them into one container. Stir the collective sample, remove a ladle full while the liquid is still spinning and pour into the sample bottle.

Pre-Sampling Nitrogen and Potassium from Liquid Manure Systems

If liquid systems cannot be agitated prior to application and a sample is needed to estimate application rates, manure samples can be dipped off the top of the stored liquid manure to analyze for N and K concentrations. Research indicates that the top-dipped liquid represents approximately 90 percent of the N concentration measured in mixed, field-collected samples. Multiply the results of the N concentration from top-dipped samples by 1.1 for a better estimate of N. Dipping a sample from the surface of a liquid storage pit does NOT provide a good estimate of P concentrations in the pit, so use of the P analysis from top-dipped samples is not recommended. Therefore, if application is limited to a P-based application rate, pre-sampling is not recommended. Producers who take these types of samples should remember to take additional samples during application to calculate the actual amount of nutrients applied and use to adjust commercial fertilizer application. *(Rieck-Hinz, 2003)*

Sampling Dry or Solid Manure

Solid manure systems will include fecal matter, urine, bedding and feed. They can vary from one location to another within the same production operation and from season to season. Sampling of dry or solid manure is best done in the field during application, because it will take into account losses that occur during handling and application. Manure is better mixed during application than during storage. Results will not be available in time to adjust application rates; however, sampling will allow producers to adjust any future commercial fertilizer rates and manure application in subsequent years. If a sample must be taken prior to application to estimate application rates, be sure to take samples from various places in the manure pile, stack or litter to obtain a representative sample for analysis. It may even be beneficial to take samples several times during the year because of the variation in bedding content.

Methods of Sampling:

As with liquid or semi-solid systems, many different methods can be used to obtain a representative sample. The method chosen will depend on the type of solid system used on the farm. Sub-samples can be taken with a shovel, pitchfork or soil probe. Regardless of the method of sampling, a composite

sample will need to be taken from all of the samples to ensure it represents the entire manure used for application. To obtain a composite sample, place all sub-samples (the more sub-samples, the more accurate the results) in a pile and mix with a shovel by continuously scooping from the outside of the pile to the center of the pile until well mixed. Fill a one-gallon plastic Zip-lock® freezer bag (or the bag provided by the laboratory) one-half full with the composite sample by turning the bag inside out over one hand. With the covered hand, grab representative handfuls of manure and turn the freezer bag right side out over the sample with the free hand. Squeeze out the excess air, close, seal and store sample in another plastic sealable bag in the freezer until mailed. *(Rieck-Hinz, 2003)*

1. *Sampling poultry litter in-house:* Collect 10 to 15 sub-samples from throughout the house to the depth the litter will be removed. Cake litter samples should be taken at the depth of cake removal. The number of samples taken near feeders or waterers should be proportionate to their space occupied in the whole house. *(LPES)*
2. *Sampling stockpiled manure, litter or compost:* Ideally, stockpiled material should be stored under cover on an impervious surface. The exterior of uncovered waste may not accurately represent the majority of the material because rainfall moves water-soluble nutrients down into the pile. If an uncovered stockpile is used over an extended period of time, it should be sampled before each application. Take 10 sub-samples from different locations around the pile at least 18 inches below the surface. *(LPES)*
3. *Sampling from a bedded pack:* It is recommended that samples from a bedded pack be taken during loading. Take at least five sub-samples while loading several spreader loads. *(Peters, 2003)*
4. *Sampling daily hauls:* Place a five-gallon pail under the barn cleaner 4 to 5 times while loading a spreader. *(Peters, 2003)*
5. *Sampling scrape-and-haul feedlots:* Facilities where manure accumulates on paved feedlots and is scraped and hauled to the field daily or several times during the week are referred to as scrape-and-haul feedlots. Sub-samples can be collected by scraping a shovel across approximately 25 feet of the paved feedlot. This process should be repeated 10 or more times, taking care to sample in a direction that slices through the variations of moisture, bedding, depth, age, etc. Avoid excessively wet areas and areas with large amounts of hay or feed. Several composite samples may be needed for this type of facility. *(Rieck-Hinz, 2003)*
6. *Sampling during spreading or land application:* Spread a sheet of plastic or a tarp in the field and drive the tractor and spreader over the top of the plastic to catch the manure from one pass of the spreader. Samples should be collected to represent the first, middle and last part of the storage facility or loads applied and should be correlated as to which loads are applied on each field to track changes in nutrient content throughout the storage facility. *(Rieck-Hinz, 2003)*

References

Peters, John. (ed.) 2003. **Recommended Methods of Manure Analysis**. University of Wisconsin Extension. A3769.

Rieck-Hinz, A., J. Lorimor, T. Richard, and K. Kohl. 2003. **How to Sample Manure for Nutrient Analysis**. Iowa State University Extension. PM1558.

Chastain, J.P. 2003. **Manure Sampling Procedures.** South Carolina Confined Animal Manure Managers Certification Program. Clemson Extension.

Livestock and Poultry Environmental Stewardship (LPES) Curriculum. Manure Sampling. Module D, Land Application and Nutrient Management.

2.4. Predicted Soil Erosion

Average water, wind, irrigation, gully and ephemeral erosion estimates

Field	Predominant Soil Type	T Factor (t/ac/yr)	Slope (%)	Water (Sheet and Rill) (t/ac/yr)	Wind (t/ac/yr)	Irrigation Erosion Controlled (y/n)	Gully Erosion Controlled (y/n)	Ephemeral Erosion Controlled (y/n)
Taylor Bro (83)	LeB2 (Lexington SIL)	5	3.5	1.4				
Taylor Bro (2)	LeB2 (Lexington SIL)	5	3.5	0.9				
Taylor Bro (3)	LeB2 (Lexington SIL)	5	3.5	0.9				
Taylor Bro (4)	Ik (Iuka L)	5	1.0	0.5				
J Aldridge (37)	LeB2 (Lexington SIL)	5	3.5	1.0				
Tosh Clark (99)	LeB2 (Lexington SIL)	5	3.5	0.9				
Webb Hart (78)	LeB2 (Lexington SIL)	5	3.5	1.2				
Prosser (77)	LeB2 (Lexington SIL)	5	3.5	1.7				
Morris Stroup (89)	LeB2 (Lexington SIL)	5	3.5	1.1				
Tosh Chunn (141)	LeB2 (Lexington SIL)	5	3.5	0.9				
Jamey Tosh (47)	FeA (Feliciana SIL)	5	1.0	0.4				
Tosh Milam (70)	LeA (Lexington SIL)	5	1.0	0.3				
Tosh Car Hopper (161)	Eb (Bibb SIL)	5	1.0	0.5				
Milam Carothers (69)	LeB2 (Lexington SIL)	5	3.5	1.0				
Carothers CBAR (113)	LeB2 (Lexington SIL)	5	3.5	0.5				
Pete Desocio (175)	LeB2 (Lexington SIL)	5	3.5	1.0				
Pete Desocio (200)	LeB2 (Lexington SIL)	5	3.5	1.0				
Henry Sow Unit (72)	Ik (Iuka L)	5	1.0	0.5				
Robinson Car (65)	LeB2 (Lexington SIL)	5	3.5	0.5				
Pete Desocio (18A)	LeB2 (Lexington SIL)	5	3.5	1.0				
Pete Desocio (18B)	LeB2 (Lexington SIL)	5	3.5	1.0				

Crop period sheet and rill erosion estimates

Field	Crop Year	Primary Crop	Starting Date (mm/dd/yyyy)	Ending Date (mm/dd/yyyy)	Crop Period Soil Loss (t/ac)
Taylor Bro (83)	2018	Corn grain	10/16/2017	9/15/2018	1.8
	2019	Soybean	9/16/2018	10/15/2019	1.5

Field	Crop Year	Primary Crop	Starting Date (mm/dd/yyyy)	Ending Date (mm/dd/yyyy)	Crop Period Soil Loss (t/ac)
	2020	Corn grain	10/16/2019	9/15/2020	1.2
	2021	Soybean	9/16/2020	10/15/2021	0.8
	2022	Corn grain	10/16/2021	9/15/2022	1.4
Taylor Bro (2)	2018	Corn grain	10/16/2017	9/15/2018	1.1
	2019	Soybean	9/16/2018	10/15/2019	0.8
	2020	Corn grain	10/16/2019	9/15/2020	0.7
	2021	Soybean	9/16/2020	10/15/2021	0.6
	2022	Corn grain	10/16/2021	9/15/2022	1.2
Taylor Bro (3)	2018	Corn grain	10/16/2017	9/15/2018	1.1
	2019	Soybean	9/16/2018	10/15/2019	0.8
	2020	Corn grain	10/16/2019	9/15/2020	0.7
	2021	Soybean	9/16/2020	10/15/2021	0.6
	2022	Corn grain	10/16/2021	9/15/2022	1.2
Taylor Bro (4)	2018	Corn grain	10/16/2017	9/15/2018	0.5
	2019	Soybean	9/16/2018	10/15/2019	0.4
	2020	Corn grain	10/16/2019	9/15/2020	0.4
	2021	Soybean	9/16/2020	10/15/2021	0.4
	2022	Corn grain	10/16/2021	9/15/2022	0.6
J Aldridge (37)	2018	Soybean	9/16/2017	10/15/2018	0.6
	2019	Corn grain	10/16/2018	9/15/2019	1.2
	2020	Soybean	9/16/2019	10/15/2020	1.3
	2021	Corn grain	10/16/2020	9/15/2021	1.1
	2022	Soybean	9/16/2021	10/15/2022	0.8
Tosh Clark (99)	2018	Soybean	9/16/2017	10/15/2018	0.5
	2019	Corn grain	10/16/2018	9/15/2019	1.2
	2020	Soybean	9/16/2019	10/15/2020	1.2
	2021	Corn grain	10/16/2020	9/15/2021	1.0
	2022	Soybean	9/16/2021	10/15/2022	0.7
Webb Hart (78)	2018	Soybean	9/16/2017	10/15/2018	0.7
	2019	Corn grain	10/16/2018	9/15/2019	1.6

Field	Crop Year	Primary Crop	Starting Date (mm/dd/yyyy)	Ending Date (mm/dd/yyyy)	Crop Period Soil Loss (t/ac)
	2020	Soybean	9/16/2019	10/15/2020	1.5
	2021	Corn grain	10/16/2020	9/15/2021	1.4
	2022	Soybean	9/16/2021	10/15/2022	0.9
Prosser (77)	2018	Soybean	9/16/2017	10/15/2018	1.0
	2019	Corn grain	10/16/2018	9/15/2019	1.8
	2020	Soybean	9/16/2019	10/15/2020	1.6
	2021	Corn grain	10/16/2020	9/15/2021	2.3
	2022	Soybean	9/16/2021	10/15/2022	1.8
Morris Stroup (89)	2018	Soybean	9/16/2017	10/15/2018	0.6
	2019	Corn grain	10/16/2018	9/15/2019	1.1
	2020	Soybean	9/16/2019	10/15/2020	1.1
	2021	Corn grain	10/16/2020	9/15/2021	1.4
	2022	Soybean	9/16/2021	10/15/2022	1.3
Tosh Chunn (141)	2018	Soybean	9/16/2017	10/15/2018	0.8
	2019	Corn grain	10/16/2018	9/15/2019	0.7
	2020	Soybean	9/16/2019	10/15/2020	0.6
	2021	Corn grain	10/16/2020	9/15/2021	1.2
	2022	Soybean	9/16/2021	10/15/2022	1.3
Jamey Tosh (47)	2018	Soybean	9/16/2017	10/15/2018	0.3
	2019	Corn grain	10/16/2018	9/15/2019	0.3
	2020	Soybean	9/16/2019	10/15/2020	0.3
	2021	Corn grain	10/16/2020	9/15/2021	0.5
	2022	Soybean	9/16/2021	10/15/2022	0.5
Tosh Milam (70)	2018	Corn grain	10/16/2017	9/15/2018	0.3
	2019	Soybean	9/16/2018	10/15/2019	0.3
	2020	Corn grain	10/16/2019	9/15/2020	0.3
	2021	Soybean	9/16/2020	10/15/2021	0.3
	2022	Corn grain	10/16/2021	9/15/2022	0.3
Tosh Car Hopper (161)	2018	Soybean	9/16/2017	10/15/2018	0.4
	2019	Corn grain	10/16/2018	9/15/2019	0.5

Field	Crop Year	Primary Crop	Starting Date (mm/dd/yyyy)	Ending Date (mm/dd/yyyy)	Crop Period Soil Loss (t/ac)
	2020	Soybean	9/16/2019	10/15/2020	0.4
	2021	Corn grain	10/16/2020	9/15/2021	0.7
	2022	Soybean	9/16/2021	10/15/2022	0.6
Milam Carothers (69)	2018	Corn grain	10/16/2017	9/15/2018	0.7
	2019	Soybean	9/16/2018	10/15/2019	0.6
	2020	Corn grain	10/16/2019	9/15/2020	1.2
	2021	Soybean	9/16/2020	10/15/2021	1.3
	2022	Corn grain	10/16/2021	9/15/2022	1.1
Carothers CBAR (113)	2018	Soybean	9/16/2017	10/15/2018	0.5
	2019	Corn grain	10/16/2018	9/15/2019	0.6
	2020	Soybean	9/16/2019	10/15/2020	0.5
	2021	Corn grain	10/16/2020	9/15/2021	0.6
	2022	Soybean	9/16/2021	10/15/2022	0.5
Pete Desocio (175)	2018	Corn grain	10/16/2017	9/15/2018	0.7
	2019	Soybean	9/16/2018	10/15/2019	0.6
	2020	Corn grain	10/16/2019	9/15/2020	1.2
	2021	Soybean	9/16/2020	10/15/2021	1.3
	2022	Corn grain	10/16/2021	9/15/2022	1.1
Pete Desocio (200)	2018	Corn grain	10/16/2017	9/15/2018	0.7
	2019	Soybean	9/16/2018	10/15/2019	0.6
	2020	Corn grain	10/16/2019	9/15/2020	1.2
	2021	Soybean	9/16/2020	10/15/2021	1.3
	2022	Corn grain	10/16/2021	9/15/2022	1.1
Henry Sow Unit (72)	2018	Corn grain	10/16/2017	9/15/2018	0.4
	2019	Soybean	9/16/2018	10/15/2019	0.4
	2020	Corn grain	10/16/2019	9/15/2020	0.6
	2021	Soybean	9/16/2020	10/15/2021	0.6
	2022	Corn grain	10/16/2021	9/15/2022	0.5
Robinson Car (65)	2018	Soybean	9/16/2017	10/15/2018	0.5
	2019	Corn grain	10/16/2018	9/15/2019	0.6

Field	Crop Year	Primary Crop	Starting Date (mm/dd/yyyy)	Ending Date (mm/dd/yyyy)	Crop Period Soil Loss (t/ac)
	2020	Soybean	9/16/2019	10/15/2020	0.5
	2021	Corn grain	10/16/2020	9/15/2021	0.6
	2022	Soybean	9/16/2021	10/15/2022	0.5
Pete Desocio (18A)	2018	Corn grain	10/16/2017	9/15/2018	0.7
	2019	Soybean	9/16/2018	10/15/2019	0.6
	2020	Corn grain	10/16/2019	9/15/2020	1.2
	2021	Soybean	9/16/2020	10/15/2021	1.3
	2022	Corn grain	10/16/2021	9/15/2022	1.1
Pete Desocio (18B)	2018	Corn grain	10/16/2017	9/15/2018	0.7
	2019	Soybean	9/16/2018	10/15/2019	0.6
	2020	Corn grain	10/16/2019	9/15/2020	1.2
	2021	Soybean	9/16/2020	10/15/2021	1.3
	2022	Corn grain	10/16/2021	9/15/2022	1.1

Section 3. Nutrient Management Plan (590)

3.1. Nitrogen and Phosphorus Risk Analyses

Tennessee Phosphorus Index

Field	Crop Year	Site Total	Management Total	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
Taylor Bro (83)	2018	11	18	11	198	Medium
Taylor Bro (83)	2019	11	16	11	176	Medium
Taylor Bro (83)	2020	11	17	11	187	Medium
Taylor Bro (83)	2021	12	16	12	192	Medium
Taylor Bro (83)	2022	11	14	11	154	Medium
Taylor Bro (2)	2018	11	24	11	264	Medium
Taylor Bro (2)	2019	11	19	11	209	Medium
Taylor Bro (2)	2020	11	24	11	264	Medium
Taylor Bro (2)	2021	11	19	11	209	Medium
Taylor Bro (2)	2022	11	13	11	143	Medium
Taylor Bro (3)	2018	11	24	11	264	Medium
Taylor Bro (3)	2019	11	19	11	209	Medium
Taylor Bro (3)	2020	11	24	11	264	Medium
Taylor Bro (3)	2021	11	19	11	209	Medium
Taylor Bro (3)	2022	11	11	11	121	Low
Taylor Bro (4)	2018	11	17	11	187	Medium
Taylor Bro (4)	2019	11	16	11	176	Medium
Taylor Bro (4)	2020	11	17	11	187	Medium
Taylor Bro (4)	2021	11	16	11	176	Medium
Taylor Bro (4)	2022	11	18	11	198	Medium
J Aldridge (37)	2018	11	19	11	209	Medium
J Aldridge (37)	2019	11	14	11	154	Medium
J Aldridge (37)	2020	11	19	11	209	Medium
J Aldridge (37)	2021	11	24	11	264	Medium
J Aldridge (37)	2022	11	19	11	209	Medium
Tosh Clark (99)	2018	11	19	11	209	Medium

Field	Crop Year	Site Total	Management Total	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
Tosh Clark (99)	2019	11	16	11	176	Medium
Tosh Clark (99)	2020	11	19	11	209	Medium
Tosh Clark (99)	2021	11	24	11	264	Medium
Tosh Clark (99)	2022	11	19	11	209	Medium
Webb Hart (78)	2018	11	19	11	209	Medium
Webb Hart (78)	2019	11	12	11	132	Low
Webb Hart (78)	2020	11	19	11	209	Medium
Webb Hart (78)	2021	11	24	11	264	Medium
Webb Hart (78)	2022	11	19	11	209	Medium
Prosser (77)	2018	11	16	11	176	Medium
Prosser (77)	2019	11	12	11	132	Low
Prosser (77)	2020	11	15	11	165	Medium
Prosser (77)	2021	11	18	11	198	Medium
Prosser (77)	2022	12	16	12	192	Medium
Morris Stroup (89)	2018	11	16	11	176	Medium
Morris Stroup (89)	2019	11	19	11	209	Medium
Morris Stroup (89)	2020	11	16	11	176	Medium
Morris Stroup (89)	2021	11	14	11	154	Medium
Morris Stroup (89)	2022	11	14	11	154	Medium
Tosh Chunn (141)	2018	11	16	11	176	Medium
Tosh Chunn (141)	2019	11	17	11	187	Medium
Tosh Chunn (141)	2020	11	16	11	176	Medium
Tosh Chunn (141)	2021	11	13	11	143	Medium
Tosh Chunn (141)	2022	11	14	11	154	Medium
Jamey Tosh (47)	2018	11	19	11	209	Medium
Jamey Tosh (47)	2019	11	24	11	264	Medium
Jamey Tosh (47)	2020	11	19	11	209	Medium
Jamey Tosh (47)	2021	11	23	11	253	Medium
Jamey Tosh (47)	2022	11	19	11	209	Medium
Tosh Milam (70)	2018	11	24	11	264	Medium
Tosh Milam (70)	2019	11	19	11	209	Medium

Field	Crop Year	Site Total	Management Total	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
Tosh Milam (70)	2020	11	24	11	264	Medium
Tosh Milam (70)	2021	11	19	11	209	Medium
Tosh Milam (70)	2022	11	24	11	264	Medium
Tosh Car Hopper (161)	2018	11	19	11	209	Medium
Tosh Car Hopper (161)	2019	11	24	11	264	Medium
Tosh Car Hopper (161)	2020	11	19	11	209	Medium
Tosh Car Hopper (161)	2021	11	21	11	231	Medium
Tosh Car Hopper (161)	2022	11	19	11	209	Medium
Milam Carothers (69)	2018	11	4	22	44	Low
Milam Carothers (69)	2019	11	4	22	44	Low
Milam Carothers (69)	2020	11	5	22	55	Low
Milam Carothers (69)	2021	11	4	22	44	Low
Milam Carothers (69)	2022	11	4	22	44	Low
Carothers CBAR (113)	2018	11	4	22	44	Low
Carothers CBAR (113)	2019	11	4	22	44	Low
Carothers CBAR (113)	2020	11	4	22	44	Low
Carothers CBAR (113)	2021	11	4	22	44	Low
Carothers CBAR (113)	2022	11	4	22	44	Low
Pete Desocio (175)	2018	11	17	11	187	Medium
Pete Desocio (175)	2019	11	16	11	176	Medium
Pete Desocio (175)	2020	11	12	11	132	Low
Pete Desocio (175)	2021	11	15	11	165	Medium
Pete Desocio (175)	2022	11	17	11	187	Medium
Pete Desocio (200)	2018	11	4	22	44	Low
Pete Desocio (200)	2019	11	4	22	44	Low
Pete Desocio (200)	2020	11	13	22	143	Medium
Pete Desocio (200)	2021	11	4	22	44	Low
Pete Desocio (200)	2022	11	4	22	44	Low
Henry Sow Unit (72)	2018	11	4	22	44	Low
Henry Sow Unit (72)	2019	11	4	22	44	Low
Henry Sow Unit (72)	2020	11	12	22	132	Low

Field	Crop Year	Site Total	Management Total	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
Henry Sow Unit (72)	2021	11	4	22	44	Low
Henry Sow Unit (72)	2022	11	4	22	44	Low
Robinson Car (65)	2018	11	19	11	209	Medium
Robinson Car (65)	2019	11	24	11	264	Medium
Robinson Car (65)	2020	11	19	11	209	Medium
Robinson Car (65)	2021	11	24	11	264	Medium
Robinson Car (65)	2022	11	19	11	209	Medium
Pete Desocio (18A)	2018	11	4	22	44	Low
Pete Desocio (18A)	2019	11	4	22	44	Low
Pete Desocio (18A)	2020	11	16	22	176	Medium
Pete Desocio (18A)	2021	11	4	22	44	Low
Pete Desocio (18A)	2022	11	4	22	44	Low
Pete Desocio (18B)	2018	11	4	22	44	Low
Pete Desocio (18B)	2019	11	4	22	44	Low
Pete Desocio (18B)	2020	11	16	22	176	Medium
Pete Desocio (18B)	2021	11	4	22	44	Low
Pete Desocio (18B)	2022	11	4	22	44	Low

3.2. Manure Application Setback Distances

Setback Requirements: Class I CAFO

Feature	Setback Criteria	Setback Distance (Feet)
Streams	Applied upgradient, no permanent or insufficient vegetated setback	100
Streams	New operation, near high quality stream	60
Surface waters	Applied upgradient, no permanent or insufficient vegetated setback	100
Open tile line inlet structures	Applied upgradient, no permanent or insufficient vegetated setback	100
Sinkholes	Applied upgradient, no permanent or insufficient vegetated setback	100
Agricultural well heads	Applied upgradient, no permanent or insufficient vegetated setback	100
Other conduits to surface waters	Applied upgradient, no permanent or insufficient vegetated setback	100
Potable well, public or private	Application down-gradient of feature	150
Potable well, public or private	Application upgradient of feature	300

Source: TN DEQ Rule 1200-4-5-.14(17)(d) (http://www.state.tn.us/sos/rules/1200/1200-04/1200-04-05.pdf)

Setback Requirements: NRCS Standard

Feature	Setback Criteria	Setback Distance (Feet)
Well	Application upgradient of feature	300
Well	Application down-gradient of feature	150

Feature	Setback Criteria	Setback Distance (Feet)
Waterbody	Predominant slope <5% with good vegetation	30
Waterbody	Poor vegetation	100
Public road	All applications	50
Dwelling (other than producer)	All applications	300
Public use area	All applications	300
Property line	Application upgradient of feature	30

Source: Nutrient Management Standard 590 (http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc)

3.3. Soil Test Data

Field	Test Year	OM (%)	P Test Used	P	K	Mg	Ca	Units	Soil pH	Buffer pH	CEC (meq/ 100g)
Taylor Bro (83)	2017		Mehlich-1	21	132			lbs/ac			
Taylor Bro (2)	2017		Mehlich-1	11	185			lbs/ac			
Taylor Bro (3)	2017		Mehlich-1	13	157			lbs/ac			
Taylor Bro (4)	2017		Mehlich-1	21	97			lbs/ac			
J Aldridge (37)	2016		Mehlich-1	10	197			lbs/ac			
Tosh Clark (99)	2017		Mehlich-1	15	170			lbs/ac			
Webb Hart (78)	2017		Mehlich-1	10	98			lbs/ac			
Prosser (77)	2017		Mehlich-1	25	206			lbs/ac			
Morris Stroup (89)	2016		Mehlich-1	21	189			lbs/ac			
Tosh Chunn (141)	2016		Mehlich-1	20	150			lbs/ac			
Jamey Tosh (47)	2017		Mehlich-1	14	101			lbs/ac			
Tosh Milam (70)	2017		Mehlich-1	17	125			lbs/ac			
Tosh Car Hopper (161)	2017		Mehlich-1	15	105			lbs/ac			
Milam Carothers (69)	2016		Mehlich-1	32	194			lbs/ac			
Carothers CBAR (113)	2015		Mehlich-1	33	140			lbs/ac			
Pete Desocio (175)	2015		Mehlich-1	22	205			lbs/ac			
Pete Desocio (200)	2016		Mehlich-1	38	135			lbs/ac			
Henry Sow Unit (72)	2017		Mehlich-1	55	160			lbs/ac			
Robinson Car (65)	2017		Mehlich-1	14	91			lbs/ac			
Pete Desocio (18A)	2017		Mehlich-1	34	115			lbs/ac			
Pete Desocio (18B)	2017		Mehlich-1	59	112			lbs/ac			

3.4. Manure Nutrient Analyses

Manure Source	Dry Matter (%)	Total N	NH_4-N	Total P_2O_5	Total K_2O	Avail. P_2O_5	Avail. K_2O	Units	Analysis Source and Date	Alum Treatment Rate (lbs/1000 sq.ft.)
Gestation Barn 1		21.9		10.4	10.7	10.4	10.7	lbs/1000 gal	Tosh Farms 10-9-2017	
Gestation Barn 2		22.7		9.0	13.5	9.0	13.5	lbs/1000 gal	Tosh Farms 10-9-2017	
Farrowing 1		21.8		8.6	10.7	8.6	10.7	lbs/1000 gal	Tosh Farms 10-9-2017	
Farrowing 2		24.9		8.7	13.6	8.7	13.6	lbs/1000 gal	Tosh Farms 10-9-2017	

a. Entered analysis may be the average of several individual analyses.
b. Tennessee assumes that 100% of manure phosphorus and 100% of manure potassium is crop available. First-year per-acre nitrogen availability for individual manure applications is given in the Planned Nutrient Applications table. For more information about nitrogen availability in Tennessee, see "Manure Application Management," Tables 3 and 4, Tennessee Extension, PB1510, 2/94 (http://wastemgmt.ag.utk.edu/Pubs/PB1510.pdf).

3.5. Planned Crops and Fertilizer Recommendations

Field	Crop Year	Planned Crop	Yield Goal (per ac)	N Rec (lbs/ac)	P_2O_5 Rec (lbs/ac)	K_2O Rec (lbs/ac)	N Removed (lbs/ac)	P_2O_5 Removed (lbs/ac)	K_2O Removed (lbs/ac)	Custom Fert. Rec. Source
Taylor Bro (83)	2018	Corn grain	160.0 bu	160	70	70	120	70	46	
Taylor Bro (83)	2019	Small grain[a]	75.0 bu	90	40	20	98	38	26	
Taylor Bro (83)	2019	Soybean	40.0 bu	0	20	40	160	32	56	
Taylor Bro (83)	2020	Corn grain	160.0 bu	160	70	70	120	70	46	
Taylor Bro (83)	2021	Small grain[a]	75.0 bu	90	40	20	98	38	26	
Taylor Bro (83)	2021	Soybean	40.0 bu	0	20	40	160	32	56	
Taylor Bro (83)	2022	Corn grain	160.0 bu	160	70	70	120	70	46	
Taylor Bro (2)	2018	Corn grain	160.0 bu	160	140	0	120	70	46	
Taylor Bro (2)	2019	Small grain[a]	75.0 bu	90	80	0	98	38	26	
Taylor Bro (2)	2019	Soybean	40.0 bu	0	10	0	160	32	56	
Taylor Bro (2)	2020	Corn grain	160.0 bu	160	140	0	120	70	46	
Taylor Bro (2)	2021	Small grain[a]	75.0 bu	90	80	0	98	38	26	
Taylor Bro (2)	2021	Soybean	40.0 bu	0	10	0	160	32	56	
Taylor Bro (2)	2022	Corn grain	160.0 bu	160	140	0	120	70	46	
Taylor Bro (3)	2018	Corn grain	160.0 bu	160	140	70	120	70	46	
Taylor Bro (3)	2019	Small grain[a]	75.0 bu	90	80	20	98	38	26	
Taylor Bro (3)	2019	Soybean	40.0 bu	0	10	40	160	32	56	
Taylor Bro (3)	2020	Corn grain	160.0 bu	160	140	70	120	70	46	
Taylor Bro (3)	2021	Small grain[a]	75.0 bu	90	80	20	98	38	26	
Taylor Bro (3)	2021	Soybean	40.0 bu	0	10	40	160	32	56	
Taylor Bro (3)	2022	Corn grain	160.0 bu	160	140	70	120	70	46	
Taylor Bro (4)	2018	Corn grain	160.0 bu	160	70	70	120	70	46	
Taylor Bro (4)	2019	Small grain[a]	75.0 bu	90	40	20	98	38	26	
Taylor Bro (4)	2019	Soybean	40.0 bu	0	20	40	160	32	56	
Taylor Bro (4)	2020	Corn grain	160.0 bu	160	70	70	120	70	46	
Taylor Bro (4)	2021	Small grain[a]	75.0 bu	90	40	20	98	38	26	
Taylor Bro (4)	2021	Soybean	40.0 bu	0	20	40	160	32	56	
Taylor Bro (4)	2022	Corn grain	160.0 bu	160	70	70	120	70	46	
J Aldridge (37)	2018	Small grain[a]	75.0 bu	75	80	0	98	38	26	

Field	Crop Year	Planned Crop	Yield Goal (per ac)	N Rec (lbs/ac)	P_2O_5 Rec (lbs/ac)	K_2O Rec (lbs/ac)	N Removed (lbs/ac)	P_2O_5 Removed (lbs/ac)	K_2O Removed (lbs/ac)	Custom Fert. Rec. Source
J Aldridge (37)	2018	Soybean	40.0 bu	0	10	0	160	32	56	
J Aldridge (37)	2019	Corn grain	160.0 bu	160	140	0	120	70	46	
J Aldridge (37)	2020	Small grain[a]	75.0 bu	90	80	0	98	38	26	
J Aldridge (37)	2020	Soybean	40.0 bu	0	10	0	160	32	56	
J Aldridge (37)	2021	Corn grain	160.0 bu	160	140	0	120	70	46	
J Aldridge (37)	2022	Small grain[a]	75.0 bu	90	80	0	98	38	26	
J Aldridge (37)	2022	Soybean	40.0 bu	0	10	0	160	32	56	
Tosh Clark (99)	2018	Small grain[a]	bu	75	80	0				
Tosh Clark (99)	2018	Soybean	55.0 bu	0	10	0	220	44	77	
Tosh Clark (99)	2019	Corn grain	200.0 bu	190	160	0	150	88	58	
Tosh Clark (99)	2020	Small grain[a]	bu	90	80	0				
Tosh Clark (99)	2020	Soybean	55.0 bu	0	10	0	220	44	77	
Tosh Clark (99)	2021	Corn grain	200.0 bu	190	160	0	150	88	58	
Tosh Clark (99)	2022	Small grain[a]	bu	90	80	0				
Tosh Clark (99)	2022	Soybean	55.0 bu	0	10	0	220	44	77	
Webb Hart (78)	2018	Small grain[a]	bu	75	80	20				
Webb Hart (78)	2018	Soybean	40.0 bu	0	10	40	160	32	56	
Webb Hart (78)	2019	Corn grain	160.0 bu	160	140	70	120	70	46	
Webb Hart (78)	2020	Small grain[a]	bu	90	80	20				
Webb Hart (78)	2020	Soybean	40.0 bu	0	10	40	160	32	56	
Webb Hart (78)	2021	Corn grain	160.0 bu	160	140	70	120	70	46	
Webb Hart (78)	2022	Small grain[a]	bu	90	80	20				
Webb Hart (78)	2022	Soybean	40.0 bu	0	10	40	160	32	56	
Prosser (77)	2018	Small grain[a]	bu	75	40	0				
Prosser (77)	2018	Soybean	40.0 bu	0	20	0	160	32	56	
Prosser (77)	2019	Corn grain	160.0 bu	160	70	0	120	70	46	
Prosser (77)	2020	Small grain[a]	bu	90	40	0				
Prosser (77)	2020	Soybean	40.0 bu	0	20	0	160	32	56	
Prosser (77)	2021	Corn grain	160.0 bu	160	70	0	120	70	46	
Prosser (77)	2022	Small grain[a]	bu	90	40	0				

Field	Crop Year	Planned Crop	Yield Goal (per ac)	N Rec (lbs/ac)	P_2O_5 Rec (lbs/ac)	K_2O Rec (lbs/ac)	N Removed (lbs/ac)	P_2O_5 Removed (lbs/ac)	K_2O Removed (lbs/ac)	Custom Fert. Rec. Source
Prosser (77)	2022	Soybean	40.0 bu	0	20	0	160	32	56	
Morris Stroup (89)	2018	Small grain[a]	75.0 bu	75	40	0	98	38	26	
Morris Stroup (89)	2018	Soybean	55.0 bu	0	20	0	220	44	77	
Morris Stroup (89)	2019	Corn grain	200.0 bu	190	80	0	150	88	58	
Morris Stroup (89)	2020	Small grain[a]	75.0 bu	90	40	0	98	38	26	
Morris Stroup (89)	2020	Soybean	55.0 bu	0	20	0	220	44	77	
Morris Stroup (89)	2021	Corn grain	200.0 bu	190	80	0	150	88	58	
Morris Stroup (89)	2022	Small grain[a]	75.0 bu	90	40	0	98	38	26	
Morris Stroup (89)	2022	Soybean	55.0 bu	0	20	0	220	44	77	
Tosh Chunn (141)	2018	Small grain[a]	75.0 bu	75	40	20	98	38	26	
Tosh Chunn (141)	2018	Soybean	40.0 bu	0	20	40	160	32	56	
Tosh Chunn (141)	2019	Corn grain	160.0 bu	160	70	70	120	70	46	
Tosh Chunn (141)	2020	Small grain[a]	75.0 bu	90	40	20	98	38	26	
Tosh Chunn (141)	2020	Soybean	40.0 bu	0	20	40	160	32	56	
Tosh Chunn (141)	2021	Corn grain	160.0 bu	160	70	70	120	70	46	
Tosh Chunn (141)	2022	Small grain[a]	75.0 bu	90	40	20	98	38	26	
Tosh Chunn (141)	2022	Soybean	40.0 bu	0	20	40	160	32	56	
Jamey Tosh (47)	2018	Small grain[a]	75.0 bu	75	80	20	98	38	26	
Jamey Tosh (47)	2018	Soybean	50.0 bu	0	10	40	200	40	70	
Jamey Tosh (47)	2019	Corn grain	175.0 bu	160	140	70	131	77	51	
Jamey Tosh (47)	2020	Small grain[a]	80.0 bu	90	80	20	104	40	28	
Jamey Tosh (47)	2020	Soybean	50.0 bu	0	10	40	200	40	70	
Jamey Tosh (47)	2021	Corn grain	175.0 bu	160	140	70	131	77	51	
Jamey Tosh (47)	2022	Small grain[a]	80.0 bu	90	80	20	104	40	28	
Jamey Tosh (47)	2022	Soybean	50.0 bu	0	10	40	200	40	70	
Tosh Milam (70)	2018	Corn grain	160.0 bu	160	140	70	120	70	46	
Tosh Milam (70)	2019	Small grain[a]	75.0 bu	90	80	20	98	38	26	
Tosh Milam (70)	2019	Soybean	40.0 bu	0	10	40	160	32	56	
Tosh Milam (70)	2020	Corn grain	160.0 bu	160	140	70	120	70	46	
Tosh Milam (70)	2021	Small grain[a]	75.0 bu	90	80	20	98	38	26	

Field	Crop Year	Planned Crop	Yield Goal (per ac)	N Rec (lbs/ac)	P_2O_5 Rec (lbs/ac)	K_2O Rec (lbs/ac)	N Removed (lbs/ac)	P_2O_5 Removed (lbs/ac)	K_2O Removed (lbs/ac)	Custom Fert. Rec. Source
Tosh Milam (70)	2021	Soybean	40.0 bu	0	10	40	160	32	56	
Tosh Milam (70)	2022	Corn grain	160.0 bu	160	140	70	120	70	46	
Tosh Car Hopper (161)	2018	Small grain[a]	bu	75	80	20				
Tosh Car Hopper (161)	2018	Soybean	40.0 bu	0	10	40	160	32	56	
Tosh Car Hopper (161)	2019	Corn grain	160.0 bu	160	140	70	120	70	46	
Tosh Car Hopper (161)	2020	Small grain[a]	bu	90	80	20				
Tosh Car Hopper (161)	2020	Soybean	40.0 bu	0	10	40	160	32	56	
Tosh Car Hopper (161)	2021	Corn grain	160.0 bu	160	140	70	120	70	46	
Tosh Car Hopper (161)	2022	Small grain[a]	75.0 bu	90	80	20	98	38	26	
Tosh Car Hopper (161)	2022	Soybean	40.0 bu	0	10	40	160	32	56	
Milam Carothers (69)	2018	Corn grain	160.0 bu	160	0	0	120	70	46	
Milam Carothers (69)	2019	Small grain[a]	75.0 bu	90	0	0	98	38	26	
Milam Carothers (69)	2019	Soybean	40.0 bu	0	0	0	160	32	56	
Milam Carothers (69)	2020	Corn grain	160.0 bu	160	0	0	120	70	46	
Milam Carothers (69)	2021	Small grain[a]	75.0 bu	90	0	0	98	38	26	
Milam Carothers (69)	2021	Soybean	40.0 bu	0	0	0	160	32	56	
Milam Carothers (69)	2022	Corn grain	160.0 bu	160	0	0	120	70	46	
Carothers CBAR (113)	2018	Small grain[a]	75.0 bu	75	0	20	98	38	26	
Carothers CBAR (113)	2018	Soybean	40.0 bu	0	0	40	160	32	56	
Carothers CBAR (113)	2019	Corn grain	160.0 bu	160	0	70	120	70	46	
Carothers CBAR (113)	2020	Small grain[a]	75.0 bu	90	0	20	98	38	26	
Carothers CBAR (113)	2020	Soybean	40.0 bu	0	0	40	160	32	56	

Field	Crop Year	Planned Crop	Yield Goal (per ac)	N Rec (lbs/ac)	P_2O_5 Rec (lbs/ac)	K_2O Rec (lbs/ac)	N Removed (lbs/ac)	P_2O_5 Removed (lbs/ac)	K_2O Removed (lbs/ac)	Custom Fert. Rec. Source
Carothers CBAR (113)	2021	Corn grain	160.0 bu	160	0	70	120	70	46	
Carothers CBAR (113)	2022	Small grain[a]	75.0 bu	90	0	20	98	38	26	
Carothers CBAR (113)	2022	Soybean	40.0 bu	0	0	40	160	32	56	
Pete Desocio (175)	2018	Corn grain	160.0 bu	160	70	0	120	70	46	
Pete Desocio (175)	2019	Small grain[a]	75.0 bu	90	40	0	98	38	26	
Pete Desocio (175)	2019	Soybean	40.0 bu	0	20	0	160	32	56	
Pete Desocio (175)	2020	Corn grain	160.0 bu	160	70	0	120	70	46	
Pete Desocio (175)	2021	Small grain[a]	75.0 bu	90	40	0	98	38	26	
Pete Desocio (175)	2021	Soybean	40.0 bu	0	20	0	160	32	56	
Pete Desocio (175)	2022	Corn grain	160.0 bu	160	70	0	120	70	46	
Pete Desocio (200)	2018	Corn grain	160.0 bu	160	0	70	120	70	46	
Pete Desocio (200)	2019	Small grain[a]	75.0 bu	90	0	20	98	38	26	
Pete Desocio (200)	2019	Soybean	40.0 bu	0	0	40	160	32	56	
Pete Desocio (200)	2020	Corn grain	160.0 bu	160	0	70	120	70	46	
Pete Desocio (200)	2021	Small grain[a]	75.0 bu	90	0	20	98	38	26	
Pete Desocio (200)	2021	Soybean	40.0 bu	0	0	40	160	32	56	
Pete Desocio (200)	2022	Corn grain	160.0 bu	160	0	70	120	70	46	
Henry Sow Unit (72)	2018	Corn grain	160.0 bu	160	0	70	120	70	46	
Henry Sow Unit (72)	2019	Small grain[a]	75.0 bu	90	0	20	98	38	26	
Henry Sow Unit (72)	2019	Soybean	40.0 bu	0	0	40	160	32	56	
Henry Sow Unit (72)	2020	Corn grain	160.0 bu	160	0	70	120	70	46	

Field	Crop Year	Planned Crop	Yield Goal (per ac)	N Rec (lbs/ac)	P_2O_5 Rec (lbs/ac)	K_2O Rec (lbs/ac)	N Removed (lbs/ac)	P_2O_5 Removed (lbs/ac)	K_2O Removed (lbs/ac)	Custom Fert. Rec. Source
Henry Sow Unit (72)	2021	Small grain[a]	75.0 bu	90	0	20	98	38	26	
Henry Sow Unit (72)	2021	Soybean	40.0 bu	0	0	40	160	32	56	
Henry Sow Unit (72)	2022	Corn grain	160.0 bu	160	0	70	120	70	46	
Robinson Car (65)	2018	Small grain[a]	75.0 bu	75	80	20	98	38	26	
Robinson Car (65)	2018	Soybean	40.0 bu	0	10	40	160	32	56	
Robinson Car (65)	2019	Corn grain	160.0 bu	160	140	70	120	70	46	
Robinson Car (65)	2020	Small grain[a]	75.0 bu	90	80	20	98	38	26	
Robinson Car (65)	2020	Soybean	40.0 bu	0	10	40	160	32	56	
Robinson Car (65)	2021	Corn grain	160.0 bu	160	140	70	120	70	46	
Robinson Car (65)	2022	Small grain[a]	75.0 bu	90	80	20	98	38	26	
Robinson Car (65)	2022	Soybean	40.0 bu	0	10	40	160	32	56	
Pete Desocio (18A)	2018	Corn grain	160.0 bu	160	0	70	120	70	46	
Pete Desocio (18A)	2019	Small grain[a]	75.0 bu	90	0	20	98	38	26	
Pete Desocio (18A)	2019	Soybean	40.0 bu	0	0	40	160	32	56	
Pete Desocio (18A)	2020	Corn grain	160.0 bu	160	0	70	120	70	46	
Pete Desocio (18A)	2021	Small grain[a]	75.0 bu	90	0	20	98	38	26	
Pete Desocio (18A)	2021	Soybean	40.0 bu	0	0	40	160	32	56	
Pete Desocio (18A)	2022	Corn grain	160.0 bu	160	0	70	120	70	46	
Pete Desocio (18B)	2018	Corn grain	160.0 bu	160	0	70	120	70	46	
Pete Desocio (18B)	2019	Small grain[a]	75.0 bu	90	0	20	98	38	26	
Pete Desocio (18B)	2019	Soybean	40.0 bu	0	0	40	160	32	56	
Pete Desocio (18B)	2020	Corn grain	160.0 bu	160	0	70	120	70	46	
Pete Desocio (18B)	2021	Small grain[a]	75.0 bu	90	0	20	98	38	26	
Pete Desocio (18B)	2021	Soybean	40.0 bu	0	0	40	160	32	56	

Field	Crop Year	Planned Crop	Yield Goal (per ac)	N Rec (lbs/ac)	P_2O_5 Rec (lbs/ac)	K_2O Rec (lbs/ac)	N Removed (lbs/ac)	P_2O_5 Removed (lbs/ac)	K_2O Removed (lbs/ac)	Custom Fert. Rec. Source
Pete Desocio (18B)	2022	Corn grain	160.0 bu	160	0	70	120	70	46	

a. Unharvested cover crop or first crop in double-crop system.
b. Custom fertilizer recommendation.

3.6. Planned Nutrient Applications (Manure-spreadable Area)

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Taylor Bro (83)	Mar 2018	Corn grain	Farrowing 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	232,800 gal	22.2	161	90	112
Taylor Bro (83)	Mar 2018	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	9,200 gal	1.9 mph	232,800 gal	25.3	160	80	125
Taylor Bro (83)	Mar 2018	Corn grain	Gestation Barn 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	490,200 gal	46.7	161	109	112
Taylor Bro (83)	Mar 2018	Corn grain	Gestation Barn 2	Tosh Applicator	2-yr P	10,100 gal	1.8 mph	244,800 gal	24.2	161	91	136
Taylor Bro (83)	Apr 2018	Corn grain	18-46-0	Surface broadcast	Supp. P	36 lbs		7,474 lbs	207.6	6	17	0
Taylor Bro (83)	Apr 2018	Corn grain	0-0-60	Surface broadcast	Supp. K	5 lbs		1,038 lbs	207.6	0	0	3
Taylor Bro (83)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	78 lbs		16,193 lbs	207.6	64	0	0
Taylor Bro (83)	Nov 2018	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		26,988 lbs	207.6	23	60	0
Taylor Bro (83)	Jan 2019	Small grain	32-0-0	Surface broadcast	Supp. N	17 gal		3,529 gal	207.6	60	0	0
Taylor Bro (83)	Apr 2020	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		24,082 lbs	207.6	0	0	70
Taylor Bro (83)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	158 lbs		32,801 lbs	207.6	130	0	0
Taylor Bro (83)	Apr 2020	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs		31,555 lbs	207.6	27	70	0
Taylor Bro (83)	Nov 2020	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		26,988 lbs	207.6	23	60	0
Taylor Bro (83)	Jan 2021	Small grain	32-0-0	Surface broadcast	Supp. N	19 gal		3,944 gal	207.6	67	0	0
Taylor Bro (83)	Mar 2022	Corn grain	Farrowing 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	465,600 gal	44.3	161	90	112
Taylor Bro (83)	Mar 2022	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	9,200 gal	1.9 mph	239,200 gal	26.0	160	80	125
Taylor Bro (83)	Mar 2022	Corn grain	Gestation Barn 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	985,350 gal	93.8	161	109	112
Taylor Bro (83)	Mar 2022	Corn grain	Gestation Barn 2	Tosh Applicator	2-yr P	10,100 gal	1.8 mph	489,600 gal	48.5	161	91	136
Taylor Bro (2)	Apr 2018	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		3,770 lbs	12.4	55	140	0
Taylor Bro (2)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	128 lbs		1,587 lbs	12.4	105	0	0
Taylor Bro (2)	Nov 2018	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		2,418 lbs	12.4	35	90	0
Taylor Bro (2)	Jan 2019	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		198 gal	12.4	57	0	0
Taylor Bro (2)	Apr 2020	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		3,770 lbs	12.4	55	140	0
Taylor Bro (2)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	128 lbs		1,587 lbs	12.4	105	0	0
Taylor Bro (2)	Nov 2020	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		2,418 lbs	12.4	35	90	0
Taylor Bro (2)	Jan 2021	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		198 gal	12.4	57	0	0
Taylor Bro (2)	Mar 2022	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	9,200 gal	1.9 mph	126,960 gal	13.8	160	80	125
Taylor Bro (3)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	128 lbs		1,370 lbs	10.7	105	0	0
Taylor Bro (3)	Apr 2018	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		3,253 lbs	10.7	55	140	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Taylor Bro (3)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		1,241 lbs	10.7	0	0	70
Taylor Bro (3)	Nov 2018	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		2,086 lbs	10.7	35	90	0
Taylor Bro (3)	Jan 2019	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		171 gal	10.7	57	0	0
Taylor Bro (3)	Apr 2020	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		1,241 lbs	10.7	0	0	70
Taylor Bro (3)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	128 lbs		1,370 lbs	10.7	105	0	0
Taylor Bro (3)	Apr 2020	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		3,253 lbs	10.7	55	140	0
Taylor Bro (3)	Nov 2020	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		2,086 lbs	10.7	35	90	0
Taylor Bro (3)	Jan 2021	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		171 gal	10.7	57	0	0
Taylor Bro (3)	Mar 2022	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	9,200 gal	1.9 mph	89,240 gal	9.7	160	80	125
Taylor Bro (4)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		1,612 lbs	13.9	0	0	70
Taylor Bro (4)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	162 lbs		2,252 lbs	13.9	133	0	0
Taylor Bro (4)	Apr 2018	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs		2,113 lbs	13.9	27	70	0
Taylor Bro (4)	Nov 2018	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		1,807 lbs	13.9	23	60	0
Taylor Bro (4)	Jan 2019	Small grain	32-0-0	Surface broadcast	Supp. N	19 gal		264 gal	13.9	67	0	0
Taylor Bro (4)	Apr 2020	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		1,612 lbs	13.9	0	0	70
Taylor Bro (4)	Apr 2020	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs		2,113 lbs	13.9	27	70	0
Taylor Bro (4)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	162 lbs		2,252 lbs	13.9	133	0	0
Taylor Bro (4)	Nov 2020	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		1,807 lbs	13.9	23	60	0
Taylor Bro (4)	Jan 2021	Small grain	32-0-0	Surface broadcast	Supp. N	19 gal		264 gal	13.9	67	0	0
Taylor Bro (4)	Mar 2022	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	9,200 gal	1.9 mph	10,200 gal	1.1	160	80	125
Taylor Bro (4)	Apr 2022	Corn grain	0-0-60	Surface broadcast	Supp. K	101 lbs		1,404 lbs	13.9	0	0	61
Taylor Bro (4)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	151 lbs		2,099 lbs	13.9	124	0	0
Taylor Bro (4)	Apr 2022	Corn grain	18-46-0	Surface broadcast	Supp. P	139 lbs		1,932 lbs	13.9	25	64	0
J Aldridge (37)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		6,981 lbs	35.8	35	90	0
J Aldridge (37)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	12 gal		430 gal	35.8	42	0	0
J Aldridge (37)	Mar 2019	Corn grain	Gestation Barn 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	361,200 gal	34.4	161	109	112
J Aldridge (37)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		6,981 lbs	35.8	35	90	0
J Aldridge (37)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	11 gal		394 gal	35.8	39	0	0
J Aldridge (37)	Apr 2021	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		10,883 lbs	35.8	55	140	0
J Aldridge (37)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	121 lbs		4,332 lbs	35.8	99	0	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
J Aldridge (37)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		6,981 lbs	35.8	35	90	0
J Aldridge (37)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		573 gal	35.8	57	0	0
Tosh Clark (99)	Nov 2017	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs		14,566 lbs	74.7	35	90	0
Tosh Clark (99)	Jan 2018	Soybean	32-0-0	Surface broadcast	Supp. N	12 gal		896 gal	74.7	42	0	0
Tosh Clark (99)	Mar 2019	Corn Grain	Gestation Barn 1	Tosh Applicator	2-yr P	12,400 gal	1.4 mph	619,200 gal	49.9	190	129	133
Tosh Clark (99)	Mar 2019	Corn Grain	Gestation Barn 2	Tosh Applicator	2-yr P	12,000 gal	1.5 mph	249,600 gal	20.8	191	108	162
Tosh Clark (99)	Nov 2019	Small Grain	18-46-0	Surface broadcast	1-yr P	195 lbs		14,566 lbs	74.7	35	90	0
Tosh Clark (99)	Jan 2020	Small Grain	32-0-0	Surface broadcast	Supp. N	11 gal		822 gal	74.7	39	0	0
Tosh Clark (99)	Apr 2021	Corn grain	18-46-0	Surface broadcast	Custom	300 lbs		22,410 lbs	74.7	54	138	0
Tosh Clark (99)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	147 lbs		10,981 lbs	74.7	121	0	0
Tosh Clark (99)	Nov 2021	Small Grain	18-46-0	Surface broadcast	1-yr P	195 lbs		14,566 lbs	74.7	35	90	0
Tosh Clark (99)	Jan 2022	Small Grain	32-0-0	Surface broadcast	Supp. N	16 gal		1,195 gal	74.7	57	0	0
Webb Hart (78)	Nov 2017	Small Grain	18-46-0	Surface broadcast	1-yr P	195 lbs		12,246 lbs	62.8	35	90	0
Webb Hart (78)	Jan 2018	Small Grain	32-0-0	Surface broadcast	Supp. N	12 gal		754 gal	62.8	42	0	0
Webb Hart (78)	Mar 2019	Corn Grain	Farrowing 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	304,500 gal	29.0	161	90	112
Webb Hart (78)	Mar 2019	Corn Grain	Gestation Barn 2	Tosh Applicator	2-yr P	10,100 gal	1.8 mph	240,000 gal	23.8	161	91	136
Webb Hart (78)	Nov 2019	Small Grain	18-46-0	Surface broadcast	1-yr P	195 lbs		12,246 lbs	62.8	35	90	0
Webb Hart (78)	Jan 2020	Small Grain	32-0-0	Surface broadcast	Supp. N	12 gal		754 gal	62.8	42	0	0
Webb Hart (78)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	122 lbs		7,662 lbs	62.8	100	0	0
Webb Hart (78)	Apr 2021	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		19,091 lbs	62.8	55	140	0
Webb Hart (78)	Apr 2021	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		7,285 lbs	62.8	0	0	70
Webb Hart (78)	Nov 2021	Small Grain	18-46-0	Surface broadcast	1-yr P	195 lbs		12,246 lbs	62.8	35	90	0
Webb Hart (78)	Jan 2022	Small Grain	32-0-0	Surface broadcast	Supp. N	16 gal		1,005 gal	62.8	57	0	0
Prosser (77)	Nov 2017	Small Grain	18-46-0	Surface broadcast	1-yr P	130 lbs		6,981 lbs	53.7	23	60	0
Prosser (77)	Jan 2018	Small Grain	32-0-0	Surface broadcast	Supp. N	15 gal		806 gal	53.7	53	0	0
Prosser (77)	Mar 2019	Corn Grain	Farrowing 2	Tosh Applicator	2-yr P	9,200 gal	1.9 mph	346,840 gal	37.7	160	80	125
Prosser (77)	Mar 2019	Corn Grain	Farrowing 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	161,100 gal	15.3	161	90	112
Prosser (77)	Nov 2019	Small Grain	18-46-0	Surface broadcast	1-yr P	102 lbs		5,477 lbs	53.7	18	47	0
Prosser (77)	Jan 2020	Small Grain	32-0-0	Surface broadcast	Supp. N	16 gal		859 gal	53.7	57	0	0
Prosser (77)	Mar 2021	Corn Grain	Farrowing 2	Tosh Applicator	2-yr P	8,900 gal	2 mph	301,440 gal	33.9	155	77	121

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Prosser (77)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	57 lbs		3,061 lbs	53.7	47	0	0
Prosser (77)	Apr 2021	Corn grain	18-46-0	Surface broadcast	Supp. P	45 lbs		2,417 lbs	53.7	8	21	0
Prosser (77)	Nov 2021	Small Grain	18-46-0	Surface broadcast	1-yr P	130 lbs		6,981 lbs	53.7	23	60	0
Prosser (77)	Jan 2022	Small Grain	32-0-0	Surface broadcast	Supp. N	16 gal		859 gal	53.7	57	0	0
Morris Stroup (89)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		6,292 lbs	48.4	23	60	0
Morris Stroup (89)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	15 gal		726 gal	48.4	53	0	0
Morris Stroup (89)	Mar 2019	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	10,900 gal	1.6 mph	118,760 gal	10.9	190	95	148
Morris Stroup (89)	Apr 2019	Corn grain	18-46-0	Surface broadcast	Supp. P	126 lbs		6,098 lbs	48.4	23	58	0
Morris Stroup (89)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	150 lbs		7,260 lbs	48.4	123	0	0
Morris Stroup (89)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		6,292 lbs	48.4	23	60	0
Morris Stroup (89)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	18 gal		871 gal	48.4	64	0	0
Morris Stroup (89)	Mar 2021	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	10,800 gal	1.7 mph	164,160 gal	15.2	188	94	147
Morris Stroup (89)	Mar 2021	Corn grain	Farrowing 1	Tosh Applicator	2-yr P	12,300 gal	1.5 mph	396,300 gal	32.2	188	106	132
Morris Stroup (89)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	82 lbs		3,969 lbs	48.4	15	38	0
Morris Stroup (89)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	17 gal		823 gal	48.4	60	0	0
Tosh Chunn (141)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		7,345 lbs	56.5	23	60	0
Tosh Chunn (141)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	15 gal		848 gal	56.5	53	0	0
Tosh Chunn (141)	Apr 2019	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs		8,588 lbs	56.5	27	70	0
Tosh Chunn (141)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		6,554 lbs	56.5	0	0	70
Tosh Chunn (141)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	162 lbs		9,153 lbs	56.5	133	0	0
Tosh Chunn (141)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		7,345 lbs	56.5	23	60	0
Tosh Chunn (141)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	19 gal		1,074 gal	56.5	67	0	0
Tosh Chunn (141)	Mar 2021	Corn grain	Gestation Barn 2	Tosh Applicator	2-yr P	10,100 gal	1.8 mph	489,600 gal	48.5	161	91	136

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Morris Stroup (89)	Mar 2021	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	10,800 gal	1.7 mph	164,160 gal	15.2	188	94	147
Morris Stroup (89)	Mar 2021	Corn grain	Farrowing 1	Tosh Applicator	2-yr P	12,300 gal	1.5 mph	396,300 gal	32.2	188	106	132
Morris Stroup (89)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	82 lbs		3,969 lbs	48.4	15	38	0
Morris Stroup (89)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	17 gal		823 gal	48.4	60	0	0
Tosh Chunn (141)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		7,345 lbs	56.5	23	60	0
Tosh Chunn (141)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	15 gal		848 gal	56.5	53	0	0
Tosh Chunn (141)	Apr 2019	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs		8,588 lbs	56.5	27	70	0
Tosh Chunn (141)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		6,554 lbs	56.5	0	0	70
Tosh Chunn (141)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	162 lbs		9,153 lbs	56.5	133	0	0
Tosh Chunn (141)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		7,345 lbs	56.5	23	60	0
Tosh Chunn (141)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	19 gal		1,074 gal	56.5	67	0	0
Tosh Chunn (141)	Mar 2021	Corn grain	Gestation Barn 2	Tosh Applicator	2-yr P	10,100 gal	1.8 mph	489,600 gal	48.5	161	91	136
Tosh Chunn (141)	Mar 2021	Corn grain	Farrowing 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	69,300 gal	6.6	161	90	112
Tosh Chunn (141)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	84 lbs		4,746 lbs	56.5	15	39	0
Tosh Chunn (141)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	17 gal		961 gal	56.5	60	0	0
Jamey Tosh (47)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		13,631 lbs	69.9	35	90	0
Jamey Tosh (47)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	12 gal		839 gal	69.9	42	0	0
Jamey Tosh (47)	Apr 2019	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		21,250 lbs	69.9	55	140	0
Jamey Tosh (47)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		8,108 lbs	69.9	0	0	70
Jamey Tosh (47)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	128 lbs		8,947 lbs	69.9	105	0	0
Jamey Tosh (47)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		13,631 lbs	69.9	35	90	0
Jamey Tosh (47)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		1,118 gal	69.9	57	0	0
Jamey Tosh (47)	Mar 2021	Corn grain	Gestation Barn 1	Tosh Applicator	Custom	8,500 gal	2.1 mph	573,750 gal	67.5	130	88	91
Jamey Tosh (47)	Apr 2021	Corn grain	18-46-0	Surface broadcast	Supp. P	67 lbs		4,683 lbs	69.9	12	31	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Jamey Tosh (47)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		13,631 lbs	69.9	35	90	0
Jamey Tosh (47)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	11 gal		769 gal	69.9	39	0	0
Tosh Milam (70)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		3,074 lbs	26.5	0	0	70
Tosh Milam (70)	Apr 2018	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		8,056 lbs	26.5	55	140	0
Tosh Milam (70)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	128 lbs		3,392 lbs	26.5	105	0	0
Tosh Milam (70)	Nov 2018	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		5,168 lbs	26.5	35	90	0
Tosh Milam (70)	Jan 2019	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		424 gal	26.5	57	0	0
Tosh Milam (70)	Apr 2020	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		8,056 lbs	26.5	55	140	0
Tosh Milam (70)	Apr 2020	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		3,074 lbs	26.5	0	0	70
Tosh Milam (70)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	128 lbs		3,392 lbs	26.5	105	0	0
Tosh Milam (70)	Nov 2020	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		5,168 lbs	26.5	35	90	0
Tosh Milam (70)	Jan 2021	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		424 gal	26.5	57	0	0
Tosh Milam (70)	Apr 2022	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		8,056 lbs	26.5	55	140	0
Tosh Milam (70)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	128 lbs		3,392 lbs	26.5	105	0	0
Tosh Milam (70)	Apr 2022	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		3,074 lbs	26.5	0	0	70
Tosh Car Hopper (161)	Nov 2017	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs		6,123 lbs	31.4	35	90	0
Tosh Car Hopper (161)	Jan 2018	Soybean	32-0-0	Surface broadcast	Supp. N	12 gal		377 gal	31.4	42	0	0
Tosh Car Hopper (161)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		3,642 lbs	31.4	0	0	70
Tosh Car Hopper (161)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	128 lbs		4,019 lbs	31.4	105	0	0
Tosh Car Hopper (161)	Apr 2019	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		9,546 lbs	31.4	55	140	0
Tosh Car Hopper (161)	Nov 2019	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs		6,123 lbs	31.4	35	90	0
Tosh Car Hopper (161)	Jan 2020	Soybean	32-0-0	Surface broadcast	Supp. N	16 gal		502 gal	31.4	57	0	0
Tosh Car Hopper (161)	Mar 2021	Corn grain	Gestation Barn 1	Tosh Applicator	Custom	8,500 gal	2.1 mph	215,900 gal	25.4	130	88	91
Tosh Car Hopper (161)	Apr 2021	Corn grain	18-46-0	Surface broadcast	Supp. P	67 lbs		2,104 lbs	31.4	12	31	0
Tosh Car Hopper (161)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		6,123 lbs	31.4	35	90	0
Tosh Car Hopper (161)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	11 gal		345 gal	31.4	39	0	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Milam Carothers (69)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs		27,241 lbs	139.7	160	0	0
Milam Carothers (69)	Jan 2019	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal		3,632 gal	139.7	92	0	0
Milam Carothers (69)	Mar 2020	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	9,200 gal	1.9 mph	45,160 gal	4.9	160	80	125
Milam Carothers (69)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	188 lbs		26,264 lbs	139.7	154	0	0
Milam Carothers (69)	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal		3,632 gal	139.7	92	0	0
Milam Carothers (69)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs		27,241 lbs	139.7	160	0	0
Carothers CBAR (113)	Jan 2018	Small grain	32-0-0	Surface broadcast	1-yr N	22 gal		1,019 gal	46.3	78	0	0
Carothers CBAR (113)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		5,371 lbs	46.3	0	0	70
Carothers CBAR (113)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs		9,028 lbs	46.3	160	0	0
Carothers CBAR (113)	Jan 2020	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal		1,204 gal	46.3	92	0	0
Carothers CBAR (113)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs		9,028 lbs	46.3	160	0	0
Carothers CBAR (113)	Apr 2021	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		5,371 lbs	46.3	0	0	70
Carothers CBAR (113)	Jan 2022	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal		1,204 gal	46.3	92	0	0
Pete Desocio (175)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	162 lbs		3,775 lbs	23.3	133	0	0
Pete Desocio (175)	Apr 2018	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs		3,542 lbs	23.3	27	70	0
Pete Desocio (175)	Nov 2018	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs		3,029 lbs	23.3	23	60	0
Pete Desocio (175)	Jan 2019	Small grain	32-0-0	Surface broadcast	Supp. N	19 gal		443 gal	23.3	67	0	0
Pete Desocio (175)	Mar 2020	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	9,200 gal	1.9 mph	207,000 gal	22.5	160	80	125
Pete Desocio (175)	Nov 2020	Small grain	18-46-0	Surface broadcast	1-yr P	108 lbs		2,516 lbs	23.3	19	50	0
Pete Desocio (175)	Jan 2021	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		373 gal	23.3	57	0	0
Pete Desocio (175)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	155 lbs		3,611 lbs	23.3	127	0	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Pete Desocio (175)	Apr 2022	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs		3,542 lbs	23.3	27	70	0
Pete Desocio (200)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		5,870 lbs	50.6	0	0	70
Pete Desocio (200)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs		9,867 lbs	50.6	160	0	0
Pete Desocio (200)	Jan 2019	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal		1,316 gal	50.6	92	0	0
Pete Desocio (200)	Mar 2020	Corn grain	Farrowing 2	Tosh Applicator	2-yr P	9,200 gal	1.9 mph	213,440 gal	23.2	160	80	125
Pete Desocio (200)	Mar 2020	Corn grain	Farrowing 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	262,950 gal	25.0	161	90	112
Pete Desocio (200)	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	22 gal		1,113 gal	50.6	78	0	0
Pete Desocio (200)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	189 lbs		9,563 lbs	50.6	155	0	0
Pete Desocio (200)	Apr 2022	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		5,870 lbs	50.6	0	0	70
Henry Sow Unit (72)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs		20,183 lbs	103.5	160	0	0
Henry Sow Unit (72)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		12,006 lbs	103.5	0	0	70
Henry Sow Unit (72)	Jan 2019	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal		2,691 gal	103.5	92	0	0
Henry Sow Unit (72)	Mar 2020	Corn grain	Gestation Barn 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	70,050 gal	6.7	161	109	112
Henry Sow Unit (72)	Mar 2020	Corn grain	Farrowing 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	202,650 gal	19.3	161	90	112
Henry Sow Unit (72)	Mar 2020	Corn grain	Gestation Barn 2	Tosh Applicator	2-yr P	10,100 gal	1.8 mph	489,600 gal	48.5	161	91	136
Henry Sow Unit (72)	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	22 gal		2,277 gal	103.5	78	0	0
Henry Sow Unit (72)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	188 lbs		19,458 lbs	103.5	154	0	0
Henry Sow Unit (72)	Apr 2022	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		12,006 lbs	103.5	0	0	70
Robinson Car (65)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		4,017 lbs	20.6	35	90	0
Robinson Car (65)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	12 gal		247 gal	20.6	42	0	0
Robinson Car (65)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	128 lbs		2,637 lbs	20.6	105	0	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Robinson Car (65)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		2,390 lbs	20.6	0	0	70
Robinson Car (65)	Apr 2019	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		6,262 lbs	20.6	55	140	0
Robinson Car (65)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		4,017 lbs	20.6	35	90	0
Robinson Car (65)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		330 gal	20.6	57	0	0
Robinson Car (65)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	128 lbs		2,637 lbs	20.6	105	0	0
Robinson Car (65)	Apr 2021	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs		6,262 lbs	20.6	55	140	0
Robinson Car (65)	Apr 2021	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		2,390 lbs	20.6	0	0	70
Robinson Car (65)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs		4,017 lbs	20.6	35	90	0
Robinson Car (65)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal		330 gal	20.6	57	0	0
Pete Desocio (18A)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		3,341 lbs	28.8	0	0	70
Pete Desocio (18A)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs		5,616 lbs	28.8	160	0	0
Pete Desocio (18A)	Jan 2019	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal		749 gal	28.8	92	0	0
Pete Desocio (18A)	Mar 2020	Corn grain	Gestation Barn 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	300,300 gal	28.6	161	109	112
Pete Desocio (18A)	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	21 gal		605 gal	28.8	74	0	0
Pete Desocio (18A)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	188 lbs		5,414 lbs	28.8	154	0	0
Pete Desocio (18A)	Apr 2022	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		3,341 lbs	28.8	0	0	70
Pete Desocio (18B)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		6,705 lbs	57.8	0	0	70
Pete Desocio (18B)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs		11,271 lbs	57.8	160	0	0
Pete Desocio (18B)	Jan 2019	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal		1,503 gal	57.8	92	0	0
Pete Desocio (18B)	Mar 2020	Corn grain	Gestation Barn 1	Tosh Applicator	2-yr P	10,500 gal	1.7 mph	610,050 gal	58.1	161	109	112
Pete Desocio (18B)	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	21 gal		1,214 gal	57.8	74	0	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Pete Desocio (18B)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	188 lbs		10,866 lbs	57.8	154	0	0
Pete Desocio (18B)	Apr 2022	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs		6,705 lbs	57.8	0	0	70

Planned Nutrient Applications (Non-manure-spreadable Area)

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Taylor Bro (83)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	5 lbs	38 lbs	7.7	0	0	3
Taylor Bro (83)	Apr 2018	Corn grain	18-46-0	Surface broadcast	1-yr P	36 lbs	277 lbs	7.7	6	17	0
Taylor Bro (83)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	78 lbs	601 lbs	7.7	64	0	0
Taylor Bro (83)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	110 lbs	847 lbs	7.7	90	0	0
Taylor Bro (83)	Nov 2018	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs	1,001 lbs	7.7	23	60	0
Taylor Bro (83)	Jan 2019	Small grain	32-0-0	Surface broadcast	Supp. N	17 gal	131 gal	7.7	60	0	0
Taylor Bro (83)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	158 lbs	1,217 lbs	7.7	130	0	0
Taylor Bro (83)	Apr 2020	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	893 lbs	7.7	0	0	70
Taylor Bro (83)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	4 lbs	31 lbs	7.7	3	0	0
Taylor Bro (83)	Apr 2020	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs	1,170 lbs	7.7	27	70	0
Taylor Bro (83)	Nov 2020	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs	1,001 lbs	7.7	23	60	0
Taylor Bro (83)	Jan 2021	Small grain	32-0-0	Surface broadcast	Supp. N	19 gal	146 gal	7.7	67	0	0
Taylor Bro (83)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	1,501 lbs	7.7	160	0	0
Taylor Bro (2)	Apr 2018	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs	30 lbs	0.1	55	140	0
Taylor Bro (2)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	128 lbs	13 lbs	0.1	105	0	0
Taylor Bro (2)	Nov 2018	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	20 lbs	0.1	35	90	0
Taylor Bro (2)	Jan 2019	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal	2 gal	0.1	57	0	0
Taylor Bro (2)	Apr 2020	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs	30 lbs	0.1	55	140	0
Taylor Bro (2)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	128 lbs	13 lbs	0.1	105	0	0
Taylor Bro (2)	Nov 2020	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	20 lbs	0.1	35	90	0
Taylor Bro (2)	Jan 2021	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal	2 gal	0.1	57	0	0
Taylor Bro (2)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	167 lbs	17 lbs	0.1	137	0	0
Taylor Bro (4)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	302 lbs	2.6	0	0	70

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Taylor Bro (4)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	162 lbs	421 lbs	2.6	133	0	0
Taylor Bro (4)	Apr 2018	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs	395 lbs	2.6	27	70	0
Taylor Bro (4)	Nov 2018	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs	338 lbs	2.6	23	60	0
Taylor Bro (4)	Jan 2019	Small grain	32-0-0	Surface broadcast	Supp. N	19 gal	49 gal	2.6	67	0	0
Taylor Bro (4)	Apr 2020	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs	395 lbs	2.6	27	70	0
Taylor Bro (4)	Apr 2020	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	302 lbs	2.6	0	0	70
Taylor Bro (4)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	162 lbs	421 lbs	2.6	133	0	0
Taylor Bro (4)	Nov 2020	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs	338 lbs	2.6	23	60	0
Taylor Bro (4)	Jan 2021	Small grain	32-0-0	Surface broadcast	Supp. N	19 gal	49 gal	2.6	67	0	0
Taylor Bro (4)	Apr 2022	Corn grain	0-0-60	Surface broadcast	1-yr K	101 lbs	263 lbs	2.6	0	0	61
Taylor Bro (4)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	151 lbs	393 lbs	2.6	124	0	0
Taylor Bro (4)	Apr 2022	Corn grain	18-46-0	Surface broadcast	1-yr P	139 lbs	361 lbs	2.6	25	64	0
Taylor Bro (4)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	13 lbs	34 lbs	2.6	11	0	0
J Aldridge (37)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	663 lbs	3.4	35	90	0
J Aldridge (37)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	12 gal	41 gal	3.4	42	0	0
J Aldridge (37)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	180 lbs	612 lbs	3.4	148	0	0
J Aldridge (37)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	663 lbs	3.4	35	90	0
J Aldridge (37)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	11 gal	37 gal	3.4	39	0	0
J Aldridge (37)	Apr 2021	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs	1,034 lbs	3.4	55	140	0
J Aldridge (37)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	7 lbs	24 lbs	3.4	6	0	0
J Aldridge (37)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	121 lbs	411 lbs	3.4	99	0	0
J Aldridge (37)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	663 lbs	3.4	35	90	0
J Aldridge (37)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal	54 gal	3.4	57	0	0
Tosh Clark (99)	Nov 2017	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs	488 lbs	2.5	35	90	0
Tosh Clark (99)	Jan 2018	Soybean	32-0-0	Surface broadcast	Supp. N	12 gal	30 gal	2.5	42	0	0
Tosh Clark (99)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	215 lbs	538 lbs	2.5	176	0	0
Tosh Clark (99)	Nov 2019	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs	488 lbs	2.5	35	90	0
Tosh Clark (99)	Jan 2020	Soybean	32-0-0	Surface broadcast	Supp. N	11 gal	28 gal	2.5	39	0	0
Tosh Clark (99)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	8 lbs	20 lbs	2.5	7	0	0
Tosh Clark (99)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	147 lbs	368 lbs	2.5	121	0	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Tosh Clark (99)	Apr 2021	Corn grain	18-46-0	Surface broadcast	Custom	300 lbs	750 lbs	2.5	54	138	0
Tosh Clark (99)	Nov 2021	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs	488 lbs	2.5	35	90	0
Tosh Clark (99)	Jan 2022	Soybean	32-0-0	Surface broadcast	Supp. N	16 gal	40 gal	2.5	57	0	0
Webb Hart (78)	Nov 2017	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs	98 lbs	0.5	35	90	0
Webb Hart (78)	Jan 2018	Soybean	32-0-0	Surface broadcast	Supp. N	12 gal	6 gal	0.5	42	0	0
Webb Hart (78)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	172 lbs	86 lbs	0.5	141	0	0
Webb Hart (78)	Nov 2019	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs	98 lbs	0.5	35	90	0
Webb Hart (78)	Jan 2020	Soybean	32-0-0	Surface broadcast	Supp. N	12 gal	6 gal	0.5	42	0	0
Webb Hart (78)	Apr 2021	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs	152 lbs	0.5	55	140	0
Webb Hart (78)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	122 lbs	61 lbs	0.5	100	0	0
Webb Hart (78)	Apr 2021	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	58 lbs	0.5	0	0	70
Webb Hart (78)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	6 lbs	3 lbs	0.5	5	0	0
Webb Hart (78)	Nov 2021	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs	98 lbs	0.5	35	90	0
Webb Hart (78)	Jan 2022	Soybean	32-0-0	Surface broadcast	Supp. N	16 gal	8 gal	0.5	57	0	0
Prosser (77)	Nov 2017	Soybean	18-46-0	Surface broadcast	1-yr P	130 lbs	364 lbs	2.8	23	60	0
Prosser (77)	Jan 2018	Soybean	32-0-0	Surface broadcast	Supp. N	15 gal	42 gal	2.8	53	0	0
Prosser (77)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	546 lbs	2.8	160	0	0
Prosser (77)	Nov 2019	Soybean	18-46-0	Surface broadcast	1-yr P	102 lbs	286 lbs	2.8	18	47	0
Prosser (77)	Jan 2020	Soybean	32-0-0	Surface broadcast	Supp. N	16 gal	45 gal	2.8	57	0	0
Prosser (77)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	57 lbs	160 lbs	2.8	47	0	0
Prosser (77)	Apr 2021	Corn grain	18-46-0	Surface broadcast	1-yr P	45 lbs	126 lbs	2.8	8	21	0
Prosser (77)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	128 lbs	358 lbs	2.8	105	0	0
Prosser (77)	Nov 2021	Soybean	18-46-0	Surface broadcast	1-yr P	130 lbs	364 lbs	2.8	23	60	0
Prosser (77)	Jan 2022	Soybean	32-0-0	Surface broadcast	Supp. N	16 gal	45 gal	2.8	57	0	0
Morris Stroup (89)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs	143 lbs	1.1	23	60	0
Morris Stroup (89)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	15 gal	16 gal	1.1	53	0	0
Morris Stroup (89)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	54 lbs	59 lbs	1.1	44	0	0
Morris Stroup (89)	Apr 2019	Corn grain	18-46-0	Surface broadcast	1-yr P	126 lbs	139 lbs	1.1	23	58	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Morris Stroup (89)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	150 lbs	165 lbs	1.1	123	0	0
Morris Stroup (89)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs	143 lbs	1.1	23	60	0
Morris Stroup (89)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	18 gal	20 gal	1.1	64	0	0
Morris Stroup (89)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	232 lbs	255 lbs	1.1	190	0	0
Morris Stroup (89)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	82 lbs	90 lbs	1.1	15	38	0
Morris Stroup (89)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	17 gal	19 gal	1.1	60	0	0
Tosh Chunn (141)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs	832 lbs	6.4	23	60	0
Tosh Chunn (141)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	15 gal	96 gal	6.4	53	0	0
Tosh Chunn (141)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	742 lbs	6.4	0	0	70
Tosh Chunn (141)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	162 lbs	1,037 lbs	6.4	133	0	0
Tosh Chunn (141)	Apr 2019	Corn grain	18-46-0	Surface broadcast	1-yr P	152 lbs	973 lbs	6.4	27	70	0
Tosh Chunn (141)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	130 lbs	832 lbs	6.4	23	60	0
Tosh Chunn (141)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	19 gal	122 gal	6.4	67	0	0
Tosh Chunn (141)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	1,248 lbs	6.4	160	0	0
Tosh Chunn (141)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	84 lbs	538 lbs	6.4	15	39	0
Tosh Chunn (141)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	17 gal	109 gal	6.4	60	0	0
Jamey Tosh (47)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	1,053 lbs	5.4	35	90	0
Jamey Tosh (47)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	12 gal	65 gal	5.4	42	0	0
Jamey Tosh (47)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	626 lbs	5.4	0	0	70
Jamey Tosh (47)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	128 lbs	691 lbs	5.4	105	0	0
Jamey Tosh (47)	Apr 2019	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs	1,642 lbs	5.4	55	140	0
Jamey Tosh (47)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	1,053 lbs	5.4	35	90	0
Jamey Tosh (47)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal	86 gal	5.4	57	0	0
Jamey Tosh (47)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	180 lbs	972 lbs	5.4	148	0	0

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Jamey Tosh (47)	Apr 2021	Corn grain	18-46-0	Surface broadcast	1-yr P	67 lbs	362 lbs	5.4	12	31	0
Jamey Tosh (47)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	1,053 lbs	5.4	35	90	0
Jamey Tosh (47)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	11 gal	59 gal	5.4	39	0	0
Tosh Car Hopper (161)	Nov 2017	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs	916 lbs	4.7	35	90	0
Tosh Car Hopper (161)	Jan 2018	Soybean	32-0-0	Surface broadcast	Supp. N	12 gal	56 gal	4.7	42	0	0
Tosh Car Hopper (161)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	128 lbs	602 lbs	4.7	105	0	0
Tosh Car Hopper (161)	Apr 2019	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs	1,429 lbs	4.7	55	140	0
Tosh Car Hopper (161)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	545 lbs	4.7	0	0	70
Tosh Car Hopper (161)	Nov 2019	Soybean	18-46-0	Surface broadcast	1-yr P	195 lbs	916 lbs	4.7	35	90	0
Tosh Car Hopper (161)	Jan 2020	Soybean	32-0-0	Surface broadcast	Supp. N	16 gal	75 gal	4.7	57	0	0
Tosh Car Hopper (161)	Apr 2021	Corn grain	18-46-0	Surface broadcast	1-yr P	67 lbs	315 lbs	4.7	12	31	0
Tosh Car Hopper (161)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	180 lbs	846 lbs	4.7	148	0	0
Tosh Car Hopper (161)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	916 lbs	4.7	35	90	0
Tosh Car Hopper (161)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	11 gal	52 gal	4.7	39	0	0
Milam Carothers (69)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	1,833 lbs	9.4	160	0	0
Milam Carothers (69)	Jan 2019	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal	244 gal	9.4	92	0	0
Milam Carothers (69)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	7 lbs	66 lbs	9.4	6	0	0
Milam Carothers (69)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	188 lbs	1,767 lbs	9.4	154	0	0
Milam Carothers (69)	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal	244 gal	9.4	92	0	0
Milam Carothers (69)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	1,833 lbs	9.4	160	0	0
Carothers CBAR (113)	Jan 2018	Small grain	32-0-0	Surface broadcast	1-yr N	22 gal	20 gal	0.9	78	0	0
Carothers CBAR (113)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	104 lbs	0.9	0	0	70

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Carothers CBAR (113)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	176 lbs	0.9	160	0	0
Carothers CBAR (113)	Jan 2020	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal	23 gal	0.9	92	0	0
Carothers CBAR (113)	Apr 2021	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	104 lbs	0.9	0	0	70
Carothers CBAR (113)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	176 lbs	0.9	160	0	0
Carothers CBAR (113)	Jan 2022	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal	23 gal	0.9	92	0	0
Henry Sow Unit (72)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	1,682 lbs	14.5	0	0	70
Henry Sow Unit (72)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	2,828 lbs	14.5	160	0	0
Henry Sow Unit (72)	Jan 2019	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal	377 gal	14.5	92	0	0
Henry Sow Unit (72)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	2,828 lbs	14.5	160	0	0
Henry Sow Unit (72)	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	22 gal	319 gal	14.5	78	0	0
Henry Sow Unit (72)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	188 lbs	2,726 lbs	14.5	154	0	0
Henry Sow Unit (72)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	7 lbs	102 lbs	14.5	6	0	0
Henry Sow Unit (72)	Apr 2022	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	1,682 lbs	14.5	0	0	70
Robinson Car (65)	Nov 2017	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	526 lbs	2.7	35	90	0
Robinson Car (65)	Jan 2018	Small grain	32-0-0	Surface broadcast	Supp. N	12 gal	32 gal	2.7	42	0	0
Robinson Car (65)	Apr 2019	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs	821 lbs	2.7	55	140	0
Robinson Car (65)	Apr 2019	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	128 lbs	346 lbs	2.7	105	0	0
Robinson Car (65)	Apr 2019	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	313 lbs	2.7	0	0	70
Robinson Car (65)	Nov 2019	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	526 lbs	2.7	35	90	0
Robinson Car (65)	Jan 2020	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal	43 gal	2.7	57	0	0
Robinson Car (65)	Apr 2021	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	313 lbs	2.7	0	0	70

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Robinson Car (65)	Apr 2021	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	128 lbs	346 lbs	2.7	105	0	0
Robinson Car (65)	Apr 2021	Corn grain	18-46-0	Surface broadcast	1-yr P	304 lbs	821 lbs	2.7	55	140	0
Robinson Car (65)	Nov 2021	Small grain	18-46-0	Surface broadcast	1-yr P	195 lbs	526 lbs	2.7	35	90	0
Robinson Car (65)	Jan 2022	Small grain	32-0-0	Surface broadcast	Supp. N	16 gal	43 gal	2.7	57	0	0
Pete Desocio (18A)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	12 lbs	0.1	0	0	70
Pete Desocio (18A)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	20 lbs	0.1	160	0	0
Pete Desocio (18A)	Jan 2019	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal	3 gal	0.1	92	0	0
Pete Desocio (18A)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	20 lbs	0.1	160	0	0
Pete Desocio (18A)	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	21 gal	2 gal	0.1	74	0	0
Pete Desocio (18A)	Apr 2022	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	12 lbs	0.1	0	0	70
Pete Desocio (18A)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	7 lbs	1 lbs	0.1	6	0	0
Pete Desocio (18A)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	188 lbs	19 lbs	0.1	154	0	0
Pete Desocio (18B)	Apr 2018	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	650 lbs	5.6	0	0	70
Pete Desocio (18B)	Apr 2018	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	1,092 lbs	5.6	160	0	0
Pete Desocio (18B)	Jan 2019	Small grain	32-0-0	Surface broadcast	1-yr N	26 gal	146 gal	5.6	92	0	0
Pete Desocio (18B)	Apr 2020	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	195 lbs	1,092 lbs	5.6	160	0	0
Pete Desocio (18B)	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	21 gal	118 gal	5.6	74	0	0
Pete Desocio (18B)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	1-yr N	7 lbs	39 lbs	5.6	6	0	0
Pete Desocio (18B)	Apr 2022	Corn grain	82-0-0	Shallow subsurface band (<4")	Supp. N	188 lbs	1,053 lbs	5.6	154	0	0
Pete Desocio (18B)	Apr 2022	Corn grain	0-0-60	Surface broadcast	1-yr K	116 lbs	650 lbs	5.6	0	0	70

3.7. Field Nutrient Balance (Manure-spreadable Area)

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2018	Taylor Bro (83)	207.6	Corn grain	160	160	70	70	162	71	71	2	1	1	1	25
2019	Taylor Bro (83)	207.6	Small grain	75	90	40	20								
2019	Taylor Bro (83)	207.6	Soybean	40	0	20	40	83	60	0	2[g]	1	-59	-9	-57
2020	Taylor Bro (83)	207.6	Corn grain	160	160	70	70	157	70	70	0[g]	1	0	0	24
2021	Taylor Bro (83)	207.6	Small grain	75	90	40	20								
2021	Taylor Bro (83)	207.6	Soybean	40	0	20	40	90	60	0	0	1	-60	-10	-58
2022	Taylor Bro (83)	207.6	Corn grain	160	160	70	70	165	100	122	5	31	52	30	76
Total	**Taylor Bro (83)**				**660**	**330**	**330**	**657**	**361**	**263**					
2018	Taylor Bro (2)	12.4	Corn grain	160	160	140	0	160	140	0	0	0	0	70	-46
2019	Taylor Bro (2)	12.4	Small grain	75	90	80	0								
2019	Taylor Bro (2)	12.4	Soybean	40	0	10	0	92	90	0	2	0	0	90	-82
2020	Taylor Bro (2)	12.4	Corn grain	160	160	140	0	160	140	0	0	0	0	160	-46
2021	Taylor Bro (2)	12.4	Small grain	75	90	80	0								
2021	Taylor Bro (2)	12.4	Soybean	40	0	10	0	92	90	0	2	0	0	180	-82
2022	Taylor Bro (2)	12.4	Corn grain	160	160	140	0	178	89	139	18	-51	139	199	93
Total	**Taylor Bro (2)**				**660**	**600**	**0**	**682**	**549**	**139**					
2018	Taylor Bro (3)	10.7	Corn grain	160	160	140	70	160	140	70	0	0	0	70	24
2019	Taylor Bro (3)	10.7	Small grain	75	90	80	20								
2019	Taylor Bro (3)	10.7	Soybean	40	0	10	40	92	90	0	2	0	-60	90	-58
2020	Taylor Bro (3)	10.7	Corn grain	160	160	140	70	160	140	70	0	0	0	160	24
2021	Taylor Bro (3)	10.7	Small grain	75	90	80	20								
2021	Taylor Bro (3)	10.7	Soybean	40	0	10	40	92	90	0	2	0	-60	180	-58
2022	Taylor Bro (3)	10.7	Corn grain	160	160	140	70	145	73	113	-15	-67	43	183	67
Total	**Taylor Bro (3)**				**660**	**600**	**330**	**649**	**533**	**253**					
2018	Taylor Bro (4)	13.9	Corn grain	160	160	70	70	160	70	70	0	0	0	0	24
2019	Taylor Bro (4)	13.9	Small grain	75	90	40	20								
2019	Taylor Bro (4)	13.9	Soybean	40	0	20	40	90	60	0	0	0	-60	-10	-58

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2020	Taylor Bro (4)	13.9	Corn grain	160	160	70	70	160	70	70	0	0	0	0	24
2021	Taylor Bro (4)	13.9	Small grain	75	90	40	20								
2021	Taylor Bro (4)	13.9	Soybean	40	0	20	40	90	60	0	0	0	-60	-10	-58
2022	Taylor Bro (4)	13.9	Corn grain	160	160	70	70	162	70	71	2	0	1	0	25
Total	**Taylor Bro (4)**				**660**	**330**	**330**	**662**	**330**	**211**					
2018	J Aldridge (37)	35.8	Small grain	75	75	80	0								
2018	J Aldridge (37)	35.8	Soybean	40	0	10	0	77	90	0	2	0	0	20	-82
2019	J Aldridge (37)	35.8	Corn grain	160	160	140	0	155	105	108	-5	-35	108	55	62
2020	J Aldridge (37)	35.8	Small grain	75	90	80	0								
2020	J Aldridge (37)	35.8	Soybean	40	0	10	0	74	90	0	-1[g]	0	108	75	-20
2021	J Aldridge (37)	35.8	Corn grain	160	160	140	0	154	140	0	0[g]	0	108	145	-46
2022	J Aldridge (37)	35.8	Small grain	75	90	80	0								
2022	J Aldridge (37)	35.8	Soybean	40	0	10	0	92	90	0	2	0	108	165	-82
Total	**J Aldridge (37)**				**575**	**550**	**0**	**552**	**515**	**108**					
2018	Tosh Clark (99)	74.7	Small grain		75	80	0								
2018	Tosh Clark (99)	74.7	Soybean	55	0	10	0	77	90	0	2	0	0		
2019	Tosh Clark (99)	74.7	Corn grain	200	190	160	0	180	116	134	-10	-44	134	118	76
2020	Tosh Clark (99)	74.7	Small grain		90	80	0								
2020	Tosh Clark (99)	74.7	Soybean	55	0	10	0	74	90	0	2[g]	0	134		
2021	Tosh Clark (99)	74.7	Corn grain	200	190	160	0	175	138	0	-8[g]	-22	134	258	18
2022	Tosh Clark (99)	74.7	Small grain		90	80	0								
2022	Tosh Clark (99)	74.7	Soybean	55	0	10	0	92	90	0	2	0	134		
Total	**Tosh Clark (99)**				**635**	**590**	**0**	**598**	**524**	**134**					
2018	Webb Hart (78)	62.8	Small grain		75	80	20								
2018	Webb Hart (78)	62.8	Soybean	40	0	10	40	77	90	0	2	0	-60		
2019	Webb Hart (78)	62.8	Corn grain	160	160	140	70	135	76	103	-25	-64	33	96	57
2020	Webb Hart (78)	62.8	Small grain		90	80	20								
2020	Webb Hart (78)	62.8	Soybean	40	0	10	40	77	90	0	-1[g]	0	-27		
2021	Webb Hart (78)	62.8	Corn grain	160	160	140	70	155	140	70	0[g]	0	0	256	81
2022	Webb Hart (78)	62.8	Small grain		90	80	20								

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2022	Webb Hart (78)	62.8	Soybean	40	0	10	40	92	90	0	2	0	-60		
Total	**Webb Hart (78)**				**575**	**550**	**320**	**536**	**486**	**173**					
2018	Prosser (77)	53.7	Small grain		75	40	0								
2018	Prosser (77)	53.7	Soybean	40	0	20	0	76	60	0	1	0	0		
2019	Prosser (77)	53.7	Corn grain	160	160	70	0	158	82	120	-2	12	120	72	74
2020	Prosser (77)	53.7	Small grain		90	40	0								
2020	Prosser (77)	53.7	Soybean	40	0	20	0	75	47	0	0[g]	-1	120		
2021	Prosser (77)	53.7	Corn grain	160	160	70	0	153	70	76	-1[g]	0	196	119	104
2022	Prosser (77)	53.7	Small grain		90	40	0								
2022	Prosser (77)	53.7	Soybean	40	0	20	0	80	60	0	-1[g]	0	196		
Total	**Prosser (77)**				**575**	**320**	**0**	**542**	**319**	**196**					
2018	Morris Stroup (89)	48.4	Small grain	75	75	40	0								
2018	Morris Stroup (89)	48.4	Soybean	55	0	20	0	76	60	0	1	0	0	-22	-103
2019	Morris Stroup (89)	48.4	Corn grain	200	190	80	0	189	79	33	-1	-1	33	-9	-25
2020	Morris Stroup (89)	48.4	Small grain	75	90	40	0								
2020	Morris Stroup (89)	48.4	Soybean	55	0	20	0	87	60	0	1[g]	0	33	-22	-103
2021	Morris Stroup (89)	48.4	Corn grain	200	190	80	0	184	100	134	-4[g]	20	167	12	76
2022	Morris Stroup (89)	48.4	Small grain	75	90	40	0								
2022	Morris Stroup (89)	48.4	Soybean	55	0	20	0	75	38	0	1[g]	-2	167	-32	-27
Total	**Morris Stroup (89)**				**635**	**340**	**0**	**611**	**337**	**167**					
2018	Tosh Chunn (141)	56.5	Small grain	75	75	40	20								
2018	Tosh Chunn (141)	56.5	Soybean	40	0	20	40	76	60	0	1	0	-60	-10	-82
2019	Tosh Chunn (141)	56.5	Corn grain	160	160	70	70	160	70	70	0	0	0	0	24
2020	Tosh Chunn (141)	56.5	Small grain	75	90	40	20								
2020	Tosh Chunn (141)	56.5	Soybean	40	0	20	40	90	60	0	0	0	-60	-10	-58
2021	Tosh Chunn (141)	56.5	Corn grain	160	160	70	70	157	89	130	-3	19	60	19	84
2022	Tosh Chunn (141)	56.5	Small grain	75	90	40	20								
2022	Tosh Chunn (141)	56.5	Soybean	40	0	20	40	75	39	0	-1[g]	-2	0	-12	2
Total	**Tosh Chunn (141)**				**575**	**320**	**320**	**558**	**318**	**200**					

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2018	Jamey Tosh (47)	69.9	Small grain	75	75	80	20								
2018	Jamey Tosh (47)	69.9	Soybean	50	0	10	40	77	90	0	2	0	-60	12	-96
2019	Jamey Tosh (47)	69.9	Corn grain	175	160	140	70	160	140	70	0	0	0	75	19
2020	Jamey Tosh (47)	69.9	Small grain	80	90	80	20								
2020	Jamey Tosh (47)	69.9	Soybean	50	0	10	40	92	90	0	2	0	-60	85	-79
2021	Jamey Tosh (47)	69.9	Corn grain	175	160	140	70	138	116	88	-22	-24	18	124	37
2022	Jamey Tosh (47)	69.9	Small grain	80	90	80	20								
2022	Jamey Tosh (47)	69.9	Soybean	50	0	10	40	74	90	0	-3[g]	0	-42	134	-61
Total	**Jamey Tosh (47)**				**575**	**550**	**320**	**541**	**526**	**158**					
2018	Tosh Milam (70)	26.5	Corn grain	160	160	140	70	160	140	70	0	0	0	70	24
2019	Tosh Milam (70)	26.5	Small grain	75	90	80	20								
2019	Tosh Milam (70)	26.5	Soybean	40	0	10	40	92	90	0	2	0	-60	90	-58
2020	Tosh Milam (70)	26.5	Corn grain	160	160	140	70	160	140	70	0	0	0	160	24
2021	Tosh Milam (70)	26.5	Small grain	75	90	80	20								
2021	Tosh Milam (70)	26.5	Soybean	40	0	10	40	92	90	0	2	0	-60	180	-58
2022	Tosh Milam (70)	26.5	Corn grain	160	160	140	70	160	140	70	0	0	0	250	24
Total	**Tosh Milam (70)**				**660**	**600**	**330**	**664**	**600**	**210**					
2018	Tosh Car Hopper (161)	31.4	Small grain		75	80	20								
2018	Tosh Car Hopper (161)	31.4	Soybean	40	0	10	40	77	90	0	2	0	-60		
2019	Tosh Car Hopper (161)	31.4	Corn grain	160	160	140	70	160	140	70	0	0	0	160	24
2020	Tosh Car Hopper (161)	31.4	Small grain		90	80	20								
2020	Tosh Car Hopper (161)	31.4	Soybean	40	0	10	40	92	90	0	2	0	-60		
2021	Tosh Car Hopper (161)	31.4	Corn grain	160	160	140	70	117	102	74	-43	-38	4	282	52
2022	Tosh Car Hopper (161)	31.4	Small grain	75	90	80	20								
2022	Tosh Car Hopper (161)	31.4	Soybean	40	0	10	40	74	90	0	-5[g]	0	-56	302	-30
Total	**Tosh Car Hopper (161)**				**575**	**550**	**320**	**520**	**512**	**144**					
2018	Milam Carothers (69)	139.7	Corn grain	160	160	0	0	160	0	0	0	0	0	-70	-46
2019	Milam Carothers (69)	139.7	Small grain	75	90	0	0								
2019	Milam Carothers (69)	139.7	Soybean	40	0	0	0	92	0	0	2	0	0	-70	-82
2020	Milam Carothers (69)	139.7	Corn grain	160	160	0	0	160	3	4	0	3	4	-67	-42

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2021	Milam Carothers (69)	139.7	Small grain	75	90	0	0								
2021	Milam Carothers (69)	139.7	Soybean	40	0	0	0	92	0	0	3[g]	3	4	-70	-82
2022	Milam Carothers (69)	139.7	Corn grain	160	160	0	0	160	0	0	0	3	4	-70	-46
Total	**Milam Carothers (69)**				**660**	**0**	**0**	**664**	**3**	**4**					
2018	Carothers CBAR (113)	46.3	Small grain	75	75	0	20								
2018	Carothers CBAR (113)	46.3	Soybean	40	0	0	40	78	0	0	3	0	-60	-70	-82
2019	Carothers CBAR (113)	46.3	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2020	Carothers CBAR (113)	46.3	Small grain	75	90	0	20								
2020	Carothers CBAR (113)	46.3	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
2021	Carothers CBAR (113)	46.3	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2022	Carothers CBAR (113)	46.3	Small grain	75	90	0	20								
2022	Carothers CBAR (113)	46.3	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
Total	**Carothers CBAR (113)**				**575**	**0**	**320**	**582**	**0**	**140**					
2018	Pete Desocio (175)	23.3	Corn grain	160	160	70	0	160	70	0	0	0	0	0	-46
2019	Pete Desocio (175)	23.3	Small grain	75	90	40	0								
2019	Pete Desocio (175)	23.3	Soybean	40	0	20	0	90	60	0	0	0	0	-10	-82
2020	Pete Desocio (175)	23.3	Corn grain	160	160	70	0	155	77	121	-5	7	121	7	75
2021	Pete Desocio (175)	23.3	Small grain	75	90	40	0								
2021	Pete Desocio (175)	23.3	Soybean	40	0	20	0	76	50	0	1[g]	-3	121	-13	-7
2022	Pete Desocio (175)	23.3	Corn grain	160	160	70	0	154	70	0	0[g]	0	121	0	-46
Total	**Pete Desocio (175)**				**660**	**330**	**0**	**635**	**327**	**121**					
2018	Pete Desocio (200)	50.6	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2019	Pete Desocio (200)	50.6	Small grain	75	90	0	20								
2019	Pete Desocio (200)	50.6	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
2020	Pete Desocio (200)	50.6	Corn grain	160	160	0	70	153	81	113	-7	81	43	11	67
2021	Pete Desocio (200)	50.6	Small grain	75	90	0	20								
2021	Pete Desocio (200)	50.6	Soybean	40	0	0	40	78	0	0	2[g]	81	-17	-59	-15
2022	Pete Desocio (200)	50.6	Corn grain	160	160	0	70	155	0	70	0[g]	81	0	-70	24
Total	**Pete Desocio (200)**				**660**	**0**	**330**	**638**	**81**	**253**					

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2018	Henry Sow Unit (72)	103.5	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2019	Henry Sow Unit (72)	103.5	Small grain	75	90	0	20								
2019	Henry Sow Unit (72)	103.5	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
2020	Henry Sow Unit (72)	103.5	Corn grain	160	160	0	70	116	66	92	-44	66	22	-4	46
2021	Henry Sow Unit (72)	103.5	Small grain	75	90	0	20								
2021	Henry Sow Unit (72)	103.5	Soybean	40	0	0	40	78	0	0	-2[g]	66	-38	-70	-36
2022	Henry Sow Unit (72)	103.5	Corn grain	160	160	0	70	154	0	70	-2[g]	66	0	-70	24
Total	**Henry Sow Unit (72)**				**660**	**0**	**330**	**600**	**66**	**232**					
2018	Robinson Car (65)	20.6	Small grain	75	75	80	20								
2018	Robinson Car (65)	20.6	Soybean	40	0	10	40	77	90	0	2	0	-60	20	-82
2019	Robinson Car (65)	20.6	Corn grain	160	160	140	70	160	140	70	0	0	0	90	24
2020	Robinson Car (65)	20.6	Small grain	75	90	80	20								
2020	Robinson Car (65)	20.6	Soybean	40	0	10	40	92	90	0	2	0	-60	110	-58
2021	Robinson Car (65)	20.6	Corn grain	160	160	140	70	160	140	70	0	0	0	180	24
2022	Robinson Car (65)	20.6	Small grain	75	90	80	20								
2022	Robinson Car (65)	20.6	Soybean	40	0	10	40	92	90	0	2	0	-60	200	-58
Total	**Robinson Car (65)**				**575**	**550**	**320**	**581**	**550**	**140**					
2018	Pete Desocio (18A)	28.8	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2019	Pete Desocio (18A)	28.8	Small grain	75	90	0	20								
2019	Pete Desocio (18A)	28.8	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
2020	Pete Desocio (18A)	28.8	Corn grain	160	160	0	70	160	108	111	0	108	41	38	65
2021	Pete Desocio (18A)	28.8	Small grain	75	90	0	20								
2021	Pete Desocio (18A)	28.8	Soybean	40	0	0	40	74	0	0	0[g]	108	-19	-32	-17
2022	Pete Desocio (18A)	28.8	Corn grain	160	160	0	70	154	0	70	0[g]	108	0	-70	24
Total	**Pete Desocio (18A)**				**660**	**0**	**330**	**640**	**108**	**251**					
2018	Pete Desocio (18B)	57.8	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2019	Pete Desocio (18B)	57.8	Small grain	75	90	0	20								
2019	Pete Desocio (18B)	57.8	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
2020	Pete Desocio (18B)	57.8	Corn grain	160	160	0	70	162	110	113	2	110	43	40	67
2021	Pete Desocio (18B)	57.8	Small grain	75	90	0	20								

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2021	Pete Desocio (18B)	57.8	Soybean	40	0	0	40	74	0	0	0[g]	110	-17	-30	-15
2022	Pete Desocio (18B)	57.8	Corn grain	160	160	0	70	154	0	70	0[g]	110	0	-70	24
Total	**Pete Desocio (18B)**				**660**	**0**	**330**	**642**	**110**	**253**					

Field Nutrient Balance (Non-manure-spreadable Area)

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2018	Taylor Bro (83)	7.7	Corn grain	160	160	70	70	160	17	3	0	-53	-67	-53	-43
2019	Taylor Bro (83)	7.7	Small grain	75	90	40	20								
2019	Taylor Bro (83)	7.7	Soybean	40	0	20	40	83	60	0	-7	0	-60	-10	-82
2020	Taylor Bro (83)	7.7	Corn grain	160	160	70	70	160	70	70	0	0	0	0	24
2021	Taylor Bro (83)	7.7	Small grain	75	90	40	20								
2021	Taylor Bro (83)	7.7	Soybean	40	0	20	40	90	60	0	0	0	-60	-10	-58
2022	Taylor Bro (83)	7.7	Corn grain	160	160	70	70	160	0	0	0	-70	-70	-70	-46
Total	**Taylor Bro (83)**				**660**	**330**	**330**	**653**	**207**	**73**					
2018	Taylor Bro (2)	0.1	Corn grain	160	160	140	0	160	140	0	0	0	0	70	-46
2019	Taylor Bro (2)	0.1	Small grain	75	90	80	0								
2019	Taylor Bro (2)	0.1	Soybean	40	0	10	0	92	90	0	2	0	0	90	-82
2020	Taylor Bro (2)	0.1	Corn grain	160	160	140	0	160	140	0	0	0	0	160	-46
2021	Taylor Bro (2)	0.1	Small grain	75	90	80	0								
2021	Taylor Bro (2)	0.1	Soybean	40	0	10	0	92	90	0	2	0	0	180	-82
2022	Taylor Bro (2)	0.1	Corn grain	160	160	140	0	137	0	0	-23	-140	0	110	-46
Total	**Taylor Bro (2)**				**660**	**600**	**0**	**641**	**460**	**0**					
2018	Taylor Bro (4)	2.6	Corn grain	160	160	70	70	160	70	70	0	0	0	0	24
2019	Taylor Bro (4)	2.6	Small grain	75	90	40	20								
2019	Taylor Bro (4)	2.6	Soybean	40	0	20	40	90	60	0	0	0	-60	-10	-58
2020	Taylor Bro (4)	2.6	Corn grain	160	160	70	70	160	70	70	0	0	0	0	24
2021	Taylor Bro (4)	2.6	Small grain	75	90	40	20								
2021	Taylor Bro (4)	2.6	Soybean	40	0	20	40	90	60	0	0	0	-60	-10	-58

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2022	Taylor Bro (4)	2.6	Corn grain	160	160	70	70	160	64	61	0	-6	-9	-6	15
Total	**Taylor Bro (4)**				**660**	**330**	**330**	**660**	**324**	**201**					
2018	J Aldridge (37)	3.4	Small grain	75	75	80	0								
2018	J Aldridge (37)	3.4	Soybean	40	0	10	0	77	90	0	2	0	0	20	-82
2019	J Aldridge (37)	3.4	Corn grain	160	160	140	0	148	0	0	-12	-140	0	-50	-46
2020	J Aldridge (37)	3.4	Small grain	75	90	80	0								
2020	J Aldridge (37)	3.4	Soybean	40	0	10	0	74	90	0	-16	0	0	20	-82
2021	J Aldridge (37)	3.4	Corn grain	160	160	140	0	160	140	0	0	0	0	90	-46
2022	J Aldridge (37)	3.4	Small grain	75	90	80	0								
2022	J Aldridge (37)	3.4	Soybean	40	0	10	0	92	90	0	2	0	0	110	-82
Total	**J Aldridge (37)**				**575**	**550**	**0**	**551**	**410**	**0**					
2018	Tosh Clark (99)	2.5	Small grain		75	80	0								
2018	Tosh Clark (99)	2.5	Soybean	55	0	10	0	77	90	0	2	0	0		
2019	Tosh Clark (99)	2.5	Corn grain	200	190	160	0	176	0	0	-14	-160	0	2	-58
2020	Tosh Clark (99)	2.5	Small grain		90	80	0								
2020	Tosh Clark (99)	2.5	Soybean	55	0	10	0	74	90	0	-16	0	0		
2021	Tosh Clark (99)	2.5	Corn grain	200	190	160	0	182	138	0	-8	-22	0	142	-58
2022	Tosh Clark (99)	2.5	Small grain		90	80	0								
2022	Tosh Clark (99)	2.5	Soybean	55	0	10	0	92	90	0	2	0	0		
Total	**Tosh Clark (99)**				**635**	**590**	**0**	**601**	**408**	**0**					
2018	Webb Hart (78)	0.5	Small grain		75	80	20								
2018	Webb Hart (78)	0.5	Soybean	40	0	10	40	77	90	0	2	0	-60		
2019	Webb Hart (78)	0.5	Corn grain	160	160	140	70	141	0	0	-19	-140	-70	20	-46
2020	Webb Hart (78)	0.5	Small grain		90	80	20								
2020	Webb Hart (78)	0.5	Soybean	40	0	10	40	77	90	0	-13	0	-60		
2021	Webb Hart (78)	0.5	Corn grain	160	160	140	70	160	140	70	0	0	0	180	24
2022	Webb Hart (78)	0.5	Small grain		90	80	20								
2022	Webb Hart (78)	0.5	Soybean	40	0	10	40	92	90	0	2	0	-60		
Total	**Webb Hart (78)**				**575**	**550**	**320**	**547**	**410**	**70**					

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2018	Prosser (77)	2.8	Small grain		75	40	0								
2018	Prosser (77)	2.8	Soybean	40	0	20	0	76	60	0	1	0	0		
2019	Prosser (77)	2.8	Corn grain	160	160	70	0	160	0	0	0	-70	0	-10	-46
2020	Prosser (77)	2.8	Small grain		90	40	0								
2020	Prosser (77)	2.8	Soybean	40	0	20	0	75	47	0	-15	-13	0		
2021	Prosser (77)	2.8	Corn grain	160	160	70	0	160	21	0	0	-49	0	-2	-46
2022	Prosser (77)	2.8	Small grain		90	40	0								
2022	Prosser (77)	2.8	Soybean	40	0	20	0	80	60	0	-10	0	0		
Total	**Prosser (77)**				**575**	**320**	**0**	**551**	**188**	**0**					
2018	Morris Stroup (89)	1.1	Small grain	75	75	40	0								
2018	Morris Stroup (89)	1.1	Soybean	55	0	20	0	76	60	0	1	0	0	-22	-103
2019	Morris Stroup (89)	1.1	Corn grain	200	190	80	0	190	58	0	0	-22	0	-30	-58
2020	Morris Stroup (89)	1.1	Small grain	75	90	40	0								
2020	Morris Stroup (89)	1.1	Soybean	55	0	20	0	87	60	0	-3	0	0	-22	-103
2021	Morris Stroup (89)	1.1	Corn grain	200	190	80	0	190	0	0	0	-80	0	-88	-58
2022	Morris Stroup (89)	1.1	Small grain	75	90	40	0								
2022	Morris Stroup (89)	1.1	Soybean	55	0	20	0	75	38	0	-15	-22	0	-44	-103
Total	**Morris Stroup (89)**				**635**	**340**	**0**	**618**	**216**	**0**					
2018	Tosh Chunn (141)	6.4	Small grain	75	75	40	20								
2018	Tosh Chunn (141)	6.4	Soybean	40	0	20	40	76	60	0	1	0	-60	-10	-82
2019	Tosh Chunn (141)	6.4	Corn grain	160	160	70	70	160	70	70	0	0	0	0	24
2020	Tosh Chunn (141)	6.4	Small grain	75	90	40	20								
2020	Tosh Chunn (141)	6.4	Soybean	40	0	20	40	90	60	0	0	0	-60	-10	-58
2021	Tosh Chunn (141)	6.4	Corn grain	160	160	70	70	160	0	0	0	-70	-70	-70	-46
2022	Tosh Chunn (141)	6.4	Small grain	75	90	40	20								
2022	Tosh Chunn (141)	6.4	Soybean	40	0	20	40	75	39	0	-15	-21	-60	-31	-82
Total	**Tosh Chunn (141)**				**575**	**320**	**320**	**561**	**229**	**70**					
2018	Jamey Tosh (47)	5.4	Small grain	75	75	80	20								
2018	Jamey Tosh (47)	5.4	Soybean	50	0	10	40	77	90	0	2	0	-60	12	-96
2019	Jamey Tosh (47)	5.4	Corn grain	175	160	140	70	160	140	70	0	0	0	75	19

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2020	Jamey Tosh (47)	5.4	Small grain	80	90	80	20								
2020	Jamey Tosh (47)	5.4	Soybean	50	0	10	40	92	90	0	2	0	-60	85	-79
2021	Jamey Tosh (47)	5.4	Corn grain	175	160	140	70	160	31	0	0	-109	-70	39	-51
2022	Jamey Tosh (47)	5.4	Small grain	80	90	80	20								
2022	Jamey Tosh (47)	5.4	Soybean	50	0	10	40	74	90	0	-16	0	-60	49	-98
Total	**Jamey Tosh (47)**				**575**	**550**	**320**	**563**	**441**	**70**					
2018	Tosh Car Hopper (161)	4.7	Small grain		75	80	20								
2018	Tosh Car Hopper (161)	4.7	Soybean	40	0	10	40	77	90	0	2	0	-60		
2019	Tosh Car Hopper (161)	4.7	Corn grain	160	160	140	70	160	140	70	0	0	0	160	24
2020	Tosh Car Hopper (161)	4.7	Small grain		90	80	20								
2020	Tosh Car Hopper (161)	4.7	Soybean	40	0	10	40	92	90	0	2	0	-60		
2021	Tosh Car Hopper (161)	4.7	Corn grain	160	160	140	70	160	31	0	0	-109	-70	211	-22
2022	Tosh Car Hopper (161)	4.7	Small grain	75	90	80	20								
2022	Tosh Car Hopper (161)	4.7	Soybean	40	0	10	40	74	90	0	-16	0	-60	231	-82
Total	**Tosh Car Hopper (161)**				**575**	**550**	**320**	**563**	**441**	**70**					
2018	Milam Carothers (69)	9.4	Corn grain	160	160	0	0	160	0	0	0	0	0	-70	-46
2019	Milam Carothers (69)	9.4	Small grain	75	90	0	0								
2019	Milam Carothers (69)	9.4	Soybean	40	0	0	0	92	0	0	2	0	0	-70	-82
2020	Milam Carothers (69)	9.4	Corn grain	160	160	0	0	160	0	0	0	0	0	-70	-46
2021	Milam Carothers (69)	9.4	Small grain	75	90	0	0								
2021	Milam Carothers (69)	9.4	Soybean	40	0	0	0	92	0	0	2	0	0	-70	-82
2022	Milam Carothers (69)	9.4	Corn grain	160	160	0	0	160	0	0	0	0	0	-70	-46
Total	**Milam Carothers (69)**				**660**	**0**	**0**	**664**	**0**	**0**					
2018	Carothers CBAR (113)	0.9	Small grain	75	75	0	20								
2018	Carothers CBAR (113)	0.9	Soybean	40	0	0	40	78	0	0	3	0	-60	-70	-82
2019	Carothers CBAR (113)	0.9	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2020	Carothers CBAR (113)	0.9	Small grain	75	90	0	20								
2020	Carothers CBAR (113)	0.9	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
2021	Carothers CBAR (113)	0.9	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2022	Carothers CBAR (113)	0.9	Small grain	75	90	0	20								

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2022	Carothers CBAR (113)	0.9	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
Total	**Carothers CBAR (113)**				**575**	**0**	**320**	**582**	**0**	**140**					
2018	Henry Sow Unit (72)	14.5	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2019	Henry Sow Unit (72)	14.5	Small grain	75	90	0	20								
2019	Henry Sow Unit (72)	14.5	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
2020	Henry Sow Unit (72)	14.5	Corn grain	160	160	0	70	160	0	0	0	0	-70	-70	-46
2021	Henry Sow Unit (72)	14.5	Small grain	75	90	0	20								
2021	Henry Sow Unit (72)	14.5	Soybean	40	0	0	40	78	0	0	-12	0	-60	-70	-82
2022	Henry Sow Unit (72)	14.5	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
Total	**Henry Sow Unit (72)**				**660**	**0**	**330**	**650**	**0**	**140**					
2018	Robinson Car (65)	2.7	Small grain	75	75	80	20								
2018	Robinson Car (65)	2.7	Soybean	40	0	10	40	77	90	0	2	0	-60	20	-82
2019	Robinson Car (65)	2.7	Corn grain	160	160	140	70	160	140	70	0	0	0	90	24
2020	Robinson Car (65)	2.7	Small grain	75	90	80	20								
2020	Robinson Car (65)	2.7	Soybean	40	0	10	40	92	90	0	2	0	-60	110	-58
2021	Robinson Car (65)	2.7	Corn grain	160	160	140	70	160	140	70	0	0	0	180	24
2022	Robinson Car (65)	2.7	Small grain	75	90	80	20								
2022	Robinson Car (65)	2.7	Soybean	40	0	10	40	92	90	0	2	0	-60	200	-58
Total	**Robinson Car (65)**				**575**	**550**	**320**	**581**	**550**	**140**					
2018	Pete Desocio (18A)	0.1	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2019	Pete Desocio (18A)	0.1	Small grain	75	90	0	20								
2019	Pete Desocio (18A)	0.1	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
2020	Pete Desocio (18A)	0.1	Corn grain	160	160	0	70	160	0	0	0	0	-70	-70	-46
2021	Pete Desocio (18A)	0.1	Small grain	75	90	0	20								
2021	Pete Desocio (18A)	0.1	Soybean	40	0	0	40	74	0	0	-16	0	-60	-70	-82
2022	Pete Desocio (18A)	0.1	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
Total	**Pete Desocio (18A)**				**660**	**0**	**330**	**646**	**0**	**140**					
2018	Pete Desocio (18B)	5.6	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
2019	Pete Desocio (18B)	5.6	Small grain	75	90	0	20								

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2019	Pete Desocio (18B)	5.6	Soybean	40	0	0	40	92	0	0	2	0	-60	-70	-58
2020	Pete Desocio (18B)	5.6	Corn grain	160	160	0	70	160	0	0	0	0	-70	-70	-46
2021	Pete Desocio (18B)	5.6	Small grain	75	90	0	20								
2021	Pete Desocio (18B)	5.6	Soybean	40	0	0	40	74	0	0	-16	0	-60	-70	-82
2022	Pete Desocio (18B)	5.6	Corn grain	160	160	0	70	160	0	70	0	0	0	-70	24
Total	**Pete Desocio (18B)**				**660**	**0**	**330**	**646**	**0**	**140**					

[a] Fertilizer Recs are the crop fertilizer recommendations. The N rec accounts for any N credit from previous legume crop.

[b] Nutrients Applied are the nutrients expected to be available to the crop from that year's manure applications plus nutrients from that year's commercial fertilizer applications and nitrates from irrigation water. With a double-crop year, the total nutrients applied for both crops and the year's balances are listed on the second crop's line.

[c] For N, Nutrients Applied minus Fertilizer Recs for indicated crop year. Also includes amount of residual N expected to become available that year from prior years' manure applications. For P_2O_5 and K_2O, Nutrients Applied minus Fertilizer Recs *through* the indicated crop year, with positive balances carried forward to subsequent years. Negative values indicate a potential need to apply additional nutrients.

[d] Nutrients Applied minus amount removed by harvested portion of crop through the indicated year. Positive balances are carried forward to subsequent years.

[e] Custom fertilizer recommendation.

[f] Legume crop is assumed to utilize some or all of the supplied N.

[g] Includes residual N expected to become available that year from prior years' manure applications.

3.8. Manure Inventory Annual Summary (Optional)

Manure Source	Plan Period	On Hand at Start of Period	Total Generated	Total Imported	Total Trans-ferred In	Total Applied	Total Exported	Total Trans-ferred Out	On Hand at End of Period	Units
Gestation Barn 1	Oct '17 - Sep '18	0	980,000	0	0	490,200	0	0	489,800	gal
Gestation Barn 2	Oct '17 - Sep '18	0	490,000	0	0	244,800	0	0	245,200	gal
Farrowing 1	Oct '17 - Sep '18	0	465,000	0	0	232,800	0	0	232,200	gal
Farrowing 2	Oct '17 - Sep '18	0	465,000	0	0	232,800	0	0	232,200	gal
All Sources	**Oct '17 - Sep '18**	**0**	**2,400,000**	**0**	**0**	**1,200,600**	**0**	**0**	**1,199,400**	**gal**
Gestation Barn 1	Oct '18 - Sep '19	489,800	980,000	0	0	980,400	0	0	489,400	gal
Gestation Barn 2	Oct '18 - Sep '19	245,200	490,000	0	0	489,600	0	0	245,600	gal
Farrowing 1	Oct '18 - Sep '19	232,200	465,000	0	0	465,600	0	0	231,600	gal
Farrowing 2	Oct '18 - Sep '19	232,200	465,000	0	0	465,600	0	0	231,600	gal
All Sources	**Oct '18 - Sep '19**	**1,199,400**	**2,400,000**	**0**	**0**	**2,401,200**	**0**	**0**	**1,198,200**	**gal**
Gestation Barn 1	Oct '19 - Sep '20	489,400	980,000	0	0	980,400	0	0	489,000	gal
Gestation Barn 2	Oct '19 - Sep '20	245,600	490,000	0	0	489,600	0	0	246,000	gal
Farrowing 1	Oct '19 - Sep '20	231,600	465,000	0	0	465,600	0	0	231,000	gal
Farrowing 2	Oct '19 - Sep '20	231,600	465,000	0	0	465,600	0	0	231,000	gal
All Sources	**Oct '19 - Sep '20**	**1,198,200**	**2,400,000**	**0**	**0**	**2,401,200**	**0**	**0**	**1,197,000**	**gal**
Gestation Barn 1	Oct '20 - Sep '21	489,000	980,000	0	0	789,650	0	0	679,350	gal
Gestation Barn 2	Oct '20 - Sep '21	246,000	490,000	0	0	489,600	0	0	246,400	gal
Farrowing 1	Oct '20 - Sep '21	231,000	465,000	0	0	465,600	0	0	230,400	gal
Farrowing 2	Oct '20 - Sep '21	231,000	465,000	0	0	465,600	0	0	230,400	gal
All Sources	**Oct '20 - Sep '21**	**1,197,000**	**2,400,000**	**0**	**0**	**2,210,450**	**0**	**0**	**1,386,550**	**gal**
Gestation Barn 1	Oct '21 - Sep '22	679,350	980,000	0	0	985,350	0	0	674,000	gal
Gestation Barn 2	Oct '21 - Sep '22	246,400	490,000	0	0	489,600	0	0	246,800	gal
Farrowing 1	Oct '21 - Sep '22	230,400	465,000	0	0	465,600	0	0	229,800	gal
Farrowing 2	Oct '21 - Sep '22	230,400	465,000	0	0	465,600	0	0	229,800	gal
All Sources	**Oct '21 - Sep '22**	**1,386,550**	**2,400,000**	**0**	**0**	**2,406,150**	**0**	**0**	**1,380,400**	**gal**

3.9. Fertilizer Material Annual Summary (Optional)

Product Analysis	Plan Period	Product Needed Oct - Dec	Product Needed Jan - Sep	Total Product Needed	Units
18-46-0	Oct '17 - Sep '18	83,264	28,910	112,174	lbs
32-0-0	Oct '17 - Sep '18	0	7,345	7,345	gal
0-0-60	Oct '17 - Sep '18	0	37,570	37,570	lbs
82-0-0	Oct '17 - Sep '18	0	110,400	110,400	lbs
18-46-0	Oct '18 - Sep '19	42,855	56,746	99,601	lbs
32-0-0	Oct '18 - Sep '19	0	15,872	15,872	gal
0-0-60	Oct '18 - Sep '19	0	28,397	28,397	lbs
82-0-0	Oct '18 - Sep '19	0	45,901	45,901	lbs
18-46-0	Oct '19 - Sep '20	81,682	50,343	132,025	lbs
32-0-0	Oct '19 - Sep '20	0	8,413	8,413	gal
0-0-60	Oct '19 - Sep '20	0	31,204	31,204	lbs
82-0-0	Oct '19 - Sep '20	0	75,120	75,120	lbs
18-46-0	Oct '20 - Sep '21	42,342	71,409	113,751	lbs
32-0-0	Oct '20 - Sep '21	0	15,097	15,097	gal
0-0-60	Oct '20 - Sep '21	0	15,521	15,521	lbs
82-0-0	Oct '20 - Sep '21	0	42,946	42,946	lbs
18-46-0	Oct '21 - Sep '22	77,995	13,892	91,887	lbs
32-0-0	Oct '21 - Sep '22	0	8,515	8,515	gal
0-0-60	Oct '21 - Sep '22	0	35,004	35,004	lbs
82-0-0	Oct '21 - Sep '22	0	89,363	89,363	lbs

3.10. Plan Nutrient Balance (Manure-spreadable Area)

	N (lbs)	P_2O_5 (lbs)	K_2O (lbs)
Total Manure Nutrients on Hand at Start of Plan[a]	0	0	0
Total Manure Nutrients Collected[b]	271,502	113,232	142,002
Total Manure Nutrients Imported[c]	0	0	0
Total Manure Nutrients Exported[d]	0	0	0
Total Manure Nutrients Gained/Lost in Transfer[e]	0	0	0
Total Manure Nutrients on Hand at End of Plan[f]	31,095	13,206	16,128
Total Manure Nutrients Applied[g]	240,360	99,889	125,661
Available Manure Nutrients Applied (Utilized by plan's crops)[h]	184,180	94,055	113,546
Available Manure Nutrients Applied (Not utilized by plan's crops)[i]	6,299	5,834	12,115
Commercial Fertilizer Nutrients Applied (Utilized by plan's crops)[j]	548,784	240,223	83,518
Commercial Fertilizer Nutrients Applied (Not utilized by plan's crops)[k]	0	0	0
Available Nutrients Applied (Manure and fertilizer; utilized by plan's crops)[l]	732,964	334,278	197,064
Nutrient Utilization Potential[m]	1,226,842	517,091	424,983
Nutrient Balance of Spreadable Acres[n p]	-493,878	-182,813	-227,919
Average Nutrient Balance per Spreadable Acre per Year[o p]	-84	-31	-39

a. Total manure nutrients present in storage at the beginning of the plan.
b. Total manure nutrients collected on the farm.
c. Total manure nutrients imported onto the farm.
d. Total manure nutrients exported from the farm to an external operation.
e. Net change in total manure nutrients due to transfers between storage units with differing analyses.
f. Total manure nutrients present in storage at the end of plan.
g. Total nutrients present in land-applied manure. These values do not account for losses due to rate, timing, and method of application.
h. Manure nutrients applied and available to crops in the plan. These values are based on the total manure nutrients applied after accounting for nutrient losses due to rate, timing, and method of application. Nutrients which will not be utilized by crops in the plan are excluded from these values.
i. Manure nutrients applied that will be utilized by crops outside the plan. This usually results from Fall nutrient applications at the end of the plan intended for crops in subsequent years.
j. Nutrients applied as commercial fertilizers and nitrates contained in irrigation water. Nutrients that will not be utilized by crops in the plan are excluded from these values.
k. Nutrients applied as commercial fertilizer which will be utilized by crops outside the plan.
l. Sum of available manure nutrients applied and commercial fertilizer nutrients applied.
m. Nutrient utilization potential of crops grown. For N the value is based on the N recommendation for non-legume crops and N uptake or other state-imposed limit for N application rates for legumes. P_2O_5 and K_2O values are based on fertilizer recommendations or crop removal (whichever is greater).
n. Available nutrients applied minus crop nutrient utilization potential. Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
o. Average per acre-year nutrient balance. Values are calculated by dividing nutrient balance of spreadable acres by the number of spreadable acres in the plan and by the length of the plan in years. Negative values indicate additional nutrient utilization potential and positive values indicate over-application.

p. Non-trivial, positive values for N indicate that the plan was not properly developed. Negative values for N indicate additional nutrient utilization potential which may or may not be intentional. For example, plans that include legume crops often will not utilize the full N utilization potential for legume crops if manure can be applied to non-legume crops that require N for optimum yield. Positive values for P_2O_5 and/or K_2O do not necessarily indicate that the plan was developed improperly. For example, producers may be allowed to apply N-based application rates of manure to fields with low soil test P values or fields with a low potential P-loss risk based on the risk assessment tool used by the state. Negative values for P_2O_5 and K_2O indicate that planned applications to some fields are less than crop removal rates or fertilizer recommendations.

Plan Nutrient Balance (Non-manure-spreadable Area)

	N (lbs)	P_2O_5 (lbs)	K_2O (lbs)

	N (lbs)	P_2O_5 (lbs)	K_2O (lbs)
Commercial Fertilizer Nutrients Applied[a]	43,398	13,270	5,607
Nutrient Utilization Potential[b]	44,096	17,437	16,657
Nutrient Balance of Non-spreadable Acres[c e]	-698	-4,167	-11,050
Average Nutrient Balance per Non-spreadable Acre per Year[d e]	-2	-12	-31

a. Nutrients applied as commercial fertilizers and nitrates contained in irrigation water.
b. Nutrient utilization potential of crops grown based on crop fertilizer recommendations.
c. Commercial fertilizer nutrients applied minus crop nutrient utilization potential. Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
d. Average per acre-year nutrient balance. Values are calculated by dividing nutrient balance of non-spreadable acres by number of non-spreadable acres in plan and by the length of the plan in years. Negative values indicate additional nutrient utilization potential and positive values indicate over-application.

e. Non-trivial, positive values for N indicate that the plan was not properly developed. Negative values for N indicate additional nutrient utilization potential which may or may not be intentional. Positive values for P_2O_5 and/or K_2O do not necessarily indicate that the plan was developed improperly. For example, multiple year applications may have been planned during the final plan year(s) and these nutrients will not be utilized by crops in the current plan. Negative values for P_2O_5 and K_2O indicate that applications to some fields may have been delayed to allow the producer to apply the nutrients in accordance with their fertilization schedule.

Closure Plan

In the event that Swine production at this location ceases, the following will be done within 360 days:

- All manure in all animal use areas will be removed and spread on the farm or spread elsewhere according to my current Nutrient Management Plan.
- The most current manure analysis will be provided to anyone removing manure from the farm.
- Any dead pigs on the farm will be disposed of at the time of closure according to methods outlined in my current Nutrient Management Plan and or allowable by Tennessee Law.
- Any manure which is land applied will be done so according to the rates discussed in my most recent Nutrient Management Plan.

The following will be completed within a reasonable period as allowable by law using Tennessee Natural Resources Conservation Service (NRCS) Standard Code 360- Closure of Waste Impoundments:

- Any manure storage facility (lagoon) located on the swine farm will be properly decommissioned.
- Any manure currently in storage at the time of closure will be removed and spread on the farm or spread elsewhere according to my current Nutrient Management Plan.
- The lagoon will be breached and backfilled and or converted to freshwater storage according to NRCS standards.

Date: 2-9-18

Record Keeping

This section includes a list of key records that Mr. Tosh will keep in order to document and verify implementation of the procedures in this CNMP. Records shall be kept for a minimum of 5 years, or for the length of the contract, rotation, or permit, whichever is longer, for each field where manure is applied.

These general records include but are not limited to:

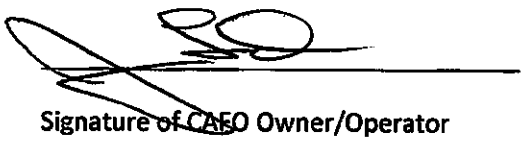
1. Soil Test Results
2. Weather and soil conditions 24 hours prior to, during and 24 hours application of manure, chemicals and pesticides.
3. Type, quantities, and sources of all nutrients generated and collected
4. Type, quantities, and sources of all nutrients applied to each field
5. Dates of manure applications
6. Inspection Reports
7. Operation and Maintenance records of conservation practices and equipment
8. Restricted pesticides used to meet label requirements
9. Equipment Calibration records
10. Crops planted, tillage method and dates planted
11. Crop harvest dates and yield
12. Adjustments to nutrient management plan based on records and changes in farming operations as appropriate
13. Weekly check of volume in pit
14. Annual visual inspection of retention structure (pits), animal holding areas, if applicable and land application areas
15. Records of mortalities and how managed

Section 9. Operation and Maintenance

Declarations to Nutrient Management Plan:

By my signature below, I affirm that I have read, understand, and will comply with the following stipulations from Tennessee's CAFO regulations that apply to my CAFO operation:

1) All animals in confinement are prevented from coming in direct contact with waters of the state.
2) All chemicals and other contaminants handled on-site are not disposed of in any manure, litter, process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants.
3) Pesticide-contaminated waters will be prevented from discharging into waste retention structures. Waste from pest control and from facilities used to manage potentially hazardous or toxic chemicals shall be handled and disposed of in a manner that will prevent pollutants from entering waste retention structures or waters of the state.
4) Chemicals, manure/litter, and process wastewater will be managed to prevent spills. Spill clean-up plans will be developed and any equipment needed for spill clean-up will be available to facility personnel.
5) All sampling of soil and manure/litter is conducted according to protocols developed by UT Extension.
6) All records outlined in the permit that I am applying for will be maintained and available on-site.
7) Any confinement buildings, waste/wastewater handling or treatment systems, lagoons, holding ponds, and any other agricultural waste containment/treatment structures constructed or modified after April 13, 2006, are or will be located in accordance with NRCS Conservation Practice Standard 313.
8) A copy of the most recent Nutrient Management Plan will be kept as part of the farm records and will be maintained and implemented as written.
9) If applicable, all waste directed to under floor pits shall be composed entirely of wastewater (i.e. washwater and animal waste).
10) The Tennessee Department of Environment and Conservation Division of Water Resources will be notified of any significant wildlife mortalities near retention ponds or following any land application of animal wastes to fields.
11) All employees involved in work activities that relate to permit compliance will receive regular training on proper operation and maintenance (O&M) of the facility and waste disposal. Training shall include appropriate topics, such as land application of wastes, good housekeeping and material management practices, proper O&M of the facility, record keeping, and spill response and clean up. The periodic scheduled dates for such training shall be identified in the current Nutrient Management Plan.
12) There shall be no land application of nutrients within 24 hours of a precipitation event that may cause runoff. The operator shall not land apply nutrients to frozen, flooded, or saturated soils.



Signature of CAFO Owner/Operator

2-[illegible]-18

Date

Operation and Maintenance

Mr. Tosh is responsible for safe operation and maintenance of the nutrient management plan including all equipment. Operation and maintenance includes the following items:

1. periodic plan review to determine if adjustments or modifications to the plan are needed. As minimum, plans will be reviewed/revised with each soil test cycle.
2. weekly there will be a visual inspection of pits
3. calibration of application equipment to ensure uniform distribution of material at planned rates.
4. documentation of the actual rate at which nutrients were applied. When the actual rates used differ from or exceed the recommended and planned rates, records will indicate the reasons for the differences.
5. Maintaining records to document plan implementation. As applicable, records include
    a. Soil test results and recommendations for nutrient application
    b. Quantities, analysis and sources of nutrients applied
    c. Dates and method of nutrient applications
    d. Crops planted, planting and harvest dates, yields, and residues removed
    e. Results of water, plant and organic byproduct analysis
    f. Dates of review and person performing the review and recommendations
    g. Conservation practices being applied.

Records will be maintained for five years or for a period longer than five years if required by other Federal, state, or local ordinances or program or contract requirements.

The disposal of material generated by the cleaning nutrient application equipment accomplished properly. Excess material should be collected and stored or field applied in an appropriate manner. Excess material should not be applied on areas of high potential risk for runoff and leaching.

The disposal/recycling of nutrient containers should be according to state and local guidelines or regulations.

Pesticides, toxic chemicals, and petroleum products will not be used in areas where leakage could enter the manure storage facility.

Conservation Practices Operation & Maintenance

Heavy Use Area Protection

The Operation and Maintenance (O&M) plan shall specify that the treatment areas and associated practices will be inspected annually and after significant storm events to identify repair and maintenance needs. The O&M plan shall contain the operational requirements for managing the heavy use area. Planned scraping intervals, replacement of fine material, storage, treatment, and/or utilization methods will also be described. Provisions for re-establishment of vegetated areas will be included. The O&M plan shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice. If using a front-end loader, recommend back dragging the manure/hay to conserve removal of gravel from the surface. Consider using fabricated large equipment tire for scraping surface. The O&M plan shall be provided to, and discussed with, the operator. The O&M plan must complement the Comprehensive Nutrient Management Plan, as necessary.

Composting Facility

An operation and maintenance (O&M) plan shall be developed consistent with the purposes of this standard, its intended life, safety requirements, and the criteria for its design. The O&M plan shall include recipe ingredients and sequence that they are layered and mixed, maximum and minimum temperature for operation, land application rates, moisture level, management of odors, testing, etc. Make adjustments throughout the composting period to ensure proper composting processes. The compost facility should be inspected regularly when the facility is empty. Replace deteriorated wooden materials or hardware. Patch concrete floors and curbs as necessary to assure water tightness. Roof structures should be examined for structural integrity and repaired as needed. Exposed metal components should be inspected for corrosion. Corroded metal should be wire brushed and painted as necessary. Closely monitor temperatures above 165^{o}F. Take action immediately to cool piles that have reached temperatures above 185^{o}F. The operation and maintenance plan shall state that composting is a biological process. It requires a combination of art and science for success. Hence, the operation may need to undergo some trial and error in the start-up of a new composting facility.

Nutrient Management (590)

The owner/client is responsible for safe operation and maintenance of the nutrient management plan including all equipment. Operation and maintenance addresses the following:

1. periodic plan review to determine if adjustments or modifications to the plan are needed. As a minimum, plans will be reviewed/revised with each soil test cycle.
2. protection of fertilizer and organic byproduct storage facilities from weather and accidental leakage or spillage.
3. calibration of application equipment to ensure uniform distribution of material at planned rates.
4. documentation of the actual rate at which nutrients were applied. When the actual rates used differ from or exceed the recommended and planned rates, records will indicate the reasons for the differences.
5. Maintaining records to document plan implementation. As applicable, records include:
   soil test results and recommendations for nutrient application,

   quantities, analyses and sources of nutrients applied,

dates and method of nutrient applications,

crops planted, planting and harvest dates, yields, and residues removed,

results of water, plant, and organic byproduct analyses, and

dates of review and person performing the review, and recommendations.

Records should be maintained for five years or for a period longer than five years if required by other Federal, state, or local ordinances, or program or contract requirements. Workers shall be protected from and avoid unnecessary contact with chemical fertilizers and organic by-products. Protection should include the use of protective clothing when working with plant nutrients. Extra caution must be taken when handling ammonia sources of nutrients, or when dealing with organic wastes stored in unventilated enclosures. The disposal of material generated by the cleaning nutrient application equipment should be accomplished properly. Excess material should be collected and stored or field applied in an appropriate manner. Excess material should not be applied on areas of high potential risk for runoff and leaching. The disposal/recycling of nutrient containers should be according to state and local guidelines or regulations.

Waters Agricultural Laboratories, Inc.

Manure/Sludge Analysis and Application Report

*P.O. Box 382 * 257 Newton Highway * Camilla, Georgia 31730-0382 * phone: (229) 336-7216*

Ship To:	Grower: **HERRONDALE**	
TOSH FARMS P.O. BOX 308 HENRY, TN 38231-	SampleNumber: **1** Lab Number: **81027MS** Type: **LAGOON**	Date Submitted: **10/09/2017** Report Date: **10/11/2017**

	Parts per million (ppm)	Pounds per 1000 gallons
Nitrogen - Total	2635	21.976
P2O5 - Total	1252.11	10.443
K2O - Total	1289.66	10.756

Results Reported On: L=LIQUID BASIS

Remarks: Suggest the use of PLANT and SOIL analysis to monitor the need for additional and/or build up of some elements.

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Ship To:	Grower: **HERRONDALE**	
TOSH FARMS P.O. BOX 308 HENRY, TN 38231-	SampleNumber: **2** Lab Number: **81028MS** Type: **LAGOON**	Date Submitted: **10/09/2017** Report Date: **10/11/2017**

	Parts per million (ppm)	Pounds per 1000 gallons
Nitrogen - Total	2730	22.768
P2O5 - Total	1084.52	9.045
K2O - Total	1629.37	13.589

Results Reported On: L=LIQUID BASIS

Remarks: Suggest the use of PLANT and SOIL analysis to monitor the need for additional and/or build up of some elements.

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Manure/Sludge Analysis and Application Report

*P.O. Box 382 * 257 Newton Highway * Camilla, Georgia 31730-0382 * phone: (229) 336-7216*

Ship To:	Grower: **HERRONDALE**	
TOSH FARMS P.O. BOX 308 HENRY, TN 38231-	SampleNumber: **3** Lab Number: **81029MS** Type: **LAGOON**	Date Submitted: **10/09/2017** Report Date: **10/11/2017**

	Parts per million (ppm)	Pounds per 1000 gallons
Nitrogen - Total	2621	21.859
P2O5 - Total	1037.15	8.650
K2O - Total	1292.38	10.778

Results Reported On: L=LIQUID BASIS

Remarks: Suggest the use of PLANT and SOIL analysis to monitor the need for additional and/or build up of some elements.

Waters Agricultural Laboratories, Inc.

Manure/Sludge Analysis and Application Report

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Ship To:	Grower: **HERRONDALE**	
TOSH FARMS P.O. BOX 308 HENRY, TN 38231-	SampleNumber: **4** Lab Number: **81030MS** Type: **LAGOON**	Date Submitted: **10/09/2017** Report Date: **10/11/2017**

	Parts per million (ppm)	Pounds per 1000 gallons
Nitrogen - Total	2995	24.978
P2O5 - Total	1044.99	8.715
K2O - Total	1640.13	13.679

Results Reported On: L=LIQUID BASIS

Remarks: Suggest the use of PLANT and SOIL analysis to monitor the need for additional and/or build up of some elements.

UTEXTENSION
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SOIL TEST REPORT

. TOSH FARMS
1586 ATLANTIC AVENUE
HENRY TN 38231

County: Henry

Robert Florence, Director
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Nashville, TN 37211-5112
(615) 832-5850
soilplantpestcenter@utk.edu

Mehlich 1 SOIL TEST RESULTS and RATINGS*
(Pounds Per Acre)

Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536649	01/18/2017	F18	1	7.3		16 L	33 L	2216 S	77 S					
536650	01/18/2017	F18	2	6.44		10 L	47 L	1976 S	100 S					
536652	01/17/2017	F18	3	6.67		14 L	74 L	1887 S	130 S					
536653	01/17/2017	F18	6	6.72		9 L	49 L	1463 S	74 S					
536654	01/17/2017	F18	7	6.69		11 L	33 L	2084 S	80 S					
536655	01/17/2017	F18	8	6.99		25 M	41 L	2194 S	104 S					
536656	01/17/2017	F18	9	6.23		12 L	84 L	2158 S	212 S					
536657	01/17/2017	F18	10	6.6		8 L	31 L	1841 S	67 S					
536658	01/17/2017	F18	12	6.96		10 L	115 M	2794 S	253 S					
536659	01/17/2017	F18	13	6.88		13 L	78 L	2234 S	149 S					
536660	01/17/2017	F18	14	6.84		24 M	59 L	2189 S	108 S					
536661	01/17/2017	F18	15	6.84		16 L	75 L	2333 S	174 S					
536662	01/17/2017	F18	17	6.66		11 L	37 L	1816 S	72 S					
536663	01/17/2017	F18	18	6.75		34 H	115 M	1782 S	113 S					
536664	01/17/2017	F18	19A	7.28		13 L	69 L	2712 S	267 S					
536665	01/17/2017	F18	19B	7.29		12 L	64 L	2477 S	192 S					
536666	01/17/2017	F18	21	7.09		18 L	46 L	2013 S	128 S					

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Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536897	01/20/2017	F-18	4	6.67		9 L	46 L	1689 S	81 S					
536898	01/20/2017	F-18	5	6.2		10 L	51 L	1454 S	73 S					
536899	01/20/2017	F-18	11	6.89		59 H	112 M	1768 S	103 S					
536900	01/20/2017	F-18	20	7.31		11 L	30 L	1983 S	79 S					

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
536897	F-18	4											
536898	F-18	5											
536899	F-18	11											
536900	F-18	20											

RECOMMENDATIONS-Fertilizer/Lime Applications and Rates

Lab Number	Farm ID	Sample Number	Crop	Nitrogen (N)	Phosphate (P2O5)	Potash (K2O)	Application Rate	Limestone	Application Rate
536897	F-18	4	Corn (150-175 BU/A)	180	140	140	pounds per acre	0	tons per acre
536897	F-18	4	Soybeans	0	40	80	pounds per acre	0	tons per acre
536898	F-18	5	Corn (150-175 BU/A)	180	140	140	pounds per acre	0	tons per acre
536898	F-18	5	Soybeans	0	40	80	pounds per acre	0	tons per acre
536899	F-18	11	Corn (150-175 BU/A)	180	0	70	pounds per acre	0	tons per acre
536899	F-18	11	Soybeans	0	0	40	pounds per acre	0	tons per acre
536900	F-18	20	Corn (150-175 BU/A)	180	140	140	pounds per acre	0	tons per acre
536900	F-18	20	Soybeans	0	40	80	pounds per acre	0	tons per acre

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(Pounds Per Acre)

Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
514713	01/04/2016		F37-1	6.08		10 L	197 H	1222 S	106 S					
514714	01/04/2016		F37-2	5.42	7.6	9 L	139 M	1353 S	164 S					
514715	01/04/2016		F37-3	6.38		9 L	177 H	1655 S	157 S					
514716	01/04/2016		F37-4	6.16		11 L	178 H	2058 S	225 S					
514717	01/04/2016		F37-5	6.18		9 L	79 L	1463 S	112 S					
514718	01/04/2016		F37-6	5.9	7.69	9 L	144 M	1635 S	175 S					
514719	01/04/2016		F37-7	6.27		11 L	175 H	2179 S	249 S					
514720	01/04/2016		F37-8	6.72		28 M	224 H	2481 S	226 S					
514722	01/04/2016		F37-9	6.26		18 L	221 H	1635 S	154 S					
514723	01/04/2016		F37-10	6.47		15 L	173 H	1360 S	115 S					
514724	01/04/2016		F37-11	6.24		14 L	215 H	1501 S	113 S					
514725	01/04/2016		F37-12	6.49		22 M	215 H	2228 S	242 S					

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
514713		F37-1											
514714		F37-2											
514715		F37-3											
514716		F37-4											
514717		F37-5											
514718		F37-6											
514719		F37-7											
514720		F37-8											
514722		F37-9											
514723		F37-10											
514724		F37-11											
514725		F37-12											

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Mehlich 1 SOIL TEST RESULTS and RATINGS* (Pounds Per Acre)

Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536394	01/18/2017	F47	1	6.71		9 L	91 M	2585 S	346 S					
536395	01/18/2017	F47	2	6.04	7.53	15 L	276 H	2081 S	327 S					
536396	01/18/2017	F47	3	6.22		12 L	152 M	2065 S	241 S					
536397	01/18/2017	F47	4	6.18		10 L	71 L	1836 S	234 S					
536398	01/18/2017	F47	5	5.85	7.51	9 L	128 M	1695 S	254 S					
536399	01/18/2017	F47	6	6.41		8 L	96 M	1651 S	183 S					
536400	01/18/2017	F47	8	6.28		20 M	79 L	1590 S	101 S					
536401	01/18/2017	F47	9	6.05	7.65	18 L	45 L	1455 S	55 S					
536402	01/18/2017	F47	10	5.58	7.56	11 L	95 M	1270 S	109 S					
536403	01/18/2017	F47	11	5.32	7.61	12 L	111 M	931 S	81 S					
536404	01/18/2017	F47	12	5.78	7.66	15 L	93 M	1062 S	101 S					
536405	01/18/2017	F47	13	6.43		53 H	63 L	1758 S	76 S					
536406	01/18/2017	F47	14	5.92	7.56	17 L	122 M	2098 S	280 S					

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
536394	F47	1											
536395	F47	2											
536396	F47	3											
536397	F47	4											
536398	F47	5											
536399	F47	6											
536400	F47	8											
536401	F47	9											
536402	F47	10											
536403	F47	11											
536404	F47	12											
536405	F47	13											
536406	F47	14											

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Mehlich 1 SOIL TEST RESULTS and RATINGS* (Pounds Per Acre)

Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536963	01/20/2017	F-65	1	6	7.62	8 L	83 L	1557 S	259 S					
536964	01/20/2017	F-65	2	5.74	7.62	15 L	87 L	1381 S	204 S					
536965	01/20/2017	F-65	3	6.04	7.58	8 L	71 L	1906 S	272 S					
536966	01/20/2017	F-65	4	5.67	7.64	6 L	70 L	1164 S	184 S					
536967	01/20/2017	F-65	5	5.39	7.62	22 M	114 M	1362 S	226 S					
536968	01/20/2017	F-65	6	6.23		12 L	96 M	2101 S	284 S					
536969	01/20/2017	F-65	7	5.88	7.58	14 L	91 M	2080 S	287 S					
536970	01/20/2017	F-65	8	5.76	7.57	8 L	130 M	1538 S	256 S					
536972	01/20/2017	F-65	9	6.47		13 L	147 M	1893 S	179 S					
536973	01/20/2017	F-65	10	5.31	7.64	11 L	102 M	640 S	68 S					
536974	01/20/2017	F-65	11	5.54	7.61	14 L	210 H	1263 S	193 S					
536975	01/20/2017	F-65	12	5.58	7.61	10 L	196 H	1474 S	212 S					

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
536963	F-65	1											
536964	F-65	2											
536965	F-65	3											
536966	F-65	4											
536967	F-65	5											
536968	F-65	6											
536969	F-65	7											
536970	F-65	8											
536972	F-65	9											
536973	F-65	10											
536974	F-65	11											
536975	F-65	12											

Mehlich 1 SOIL TEST RESULTS and RATINGS* (Pounds Per Acre)														
Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
517645	02/01/2016		F691	6.84		38 H	158 M	3823 S	382 S					
517646	02/01/2016		F692	6.53		32 H	158 M	2427 S	176 S					
517647	02/01/2016		F693	7.51		70 H	141 M	3720 S	279 S					
517648	02/01/2016		F694	7.02		43 H	106 M	2440 S	162 S					
517649	02/01/2016		F695	6.7		125 V	246 H	1982 S	131 S					
517650	02/01/2016		F696	6.58		65 H	186 H	1244 S	90 S					
517651	02/01/2016		F697	6.01		40 H	131 M	1853 S	147 S					
517652	02/01/2016		F698	6.26		59 H	273 H	2001 S	194 S					
517653	02/01/2016		F699	6.58		56 H	231 H	2076 S	141 S					
517654	02/01/2016		F6910	7.36		97 H	171 H	2348 S	144 S					
517655	02/01/2016		F6911	6.17		32 H	194 H	2035 S	164 S					
517656	02/01/2016		F6912	5.88	7.59	34 H	154 M	2003 S	285 S					
517657	02/01/2016		F6913	6.27		21 M	210 H	2125 S	296 S					
517658	02/01/2016		F6914	5.89	7.69	18 L	196 H	2517 S	242 S					
517659	02/01/2016		F6915	6.47		18 L	186 H	2298 S	194 S					
517660	02/01/2016		F6916	6.41		16 L	171 H	2743 S	217 S					
517661	02/01/2016		F6917	5.62	7.71	20 M	183 H	1820 S	149 S					
517662	02/01/2016		F6918	6.02		20 M	186 H	1609 S	126 S					
517663	02/01/2016		F6919	6.12		21 M	207 H	2429 S	256 S					
517664	02/01/2016		F6920	4.82	7.62	20 M	206 H	754 S	72 S					
517665	02/01/2016		F6921	5.65	7.65	16 L	119 M	1802 S	183 S					
517666	02/01/2016		F6922	4.74	7.5	18 L	164 H	1528 S	181 S					
517667	02/01/2016		F6923	5.58	7.65	32 H	302 H	2516 S	256 S					
517668	02/01/2016		F6924	4.97	7.65	17 L	269 H	1366 S	148 S					
517669	02/01/2016		F6925	6.41		60 H	265 H	2804 S	163 S					
517670	02/01/2016		F6926	5.37	7.64	15 L	176 H	2045 S	168 S					
517671	02/01/2016		F6927	4.94	7.66	10 L	223 H	1110 S	118 S					
517672	02/01/2016		F6928	5.52	7.61	16 L	201 H	1712 S	184 S					
517673	02/01/2016		F6929	5.43	7.7	22 M	302 H	1332 S	122 S					
517674	02/01/2016		F6930	5.77	7.71	25 M	195 H	1893 S	155 S					
517675	02/01/2016		F6931	5.54	7.64	13 L	172 H	1968 S	192 S					
517676	02/01/2016		F6932	5.8	7.71	25 M	202 H	1690 S	103 S					
517677	02/01/2016		F6933	6.06		23 M	231 H	1988 S	146 S					
517678	02/01/2016		F6934	6.67		52 H	224 H	3887 S	182 S					
517679	02/01/2016		F6935	5.53	7.68	14 L	194 H	1629 S	117 S					
517680	02/01/2016		F6936	6.63		52 H	198 H	3158 S	226 S					
517682	02/01/2016		F6937	5.9	7.7	16 L	130 M	1408 S	126 S					
517683	02/01/2016		F6938	5.58	7.66	8 L	153 M	1072 S	110 S					
517684	02/01/2016		F6939	5.97	7.7	32 H	136 M	1584 S	149 S					
517685	02/01/2016		F6940	5.28	7.61	14 L	204 H	1316 S	133 S					
517686	02/01/2016		F6941	6.45		29 M	245 H	1987 S	132 S					
517687	02/01/2016		F6942	6.65		58 H	188 H	1867 S	103 S					
517688	02/01/2016		F6943	5.97	7.68	22 M	145 M	1823 S	162 S					
517689	02/01/2016		F6944	6.79		33 H	149 M	3225 S	291 S					
517690	02/01/2016		F6945	6.12		19 M	156 M	2507 S	230 S					
517691	02/01/2016		F6946	5.41	7.53	35 H	108 M	1563 S	150 S					

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SOIL TEST REPORT

. TOSH FARMS
1586 ATLANTIC AVENUE
HENRY TN 38231

County: Henry

Robert Florence, Director
5201 Marchant Drive
Nashville, TN 37211-5112
(615) 832-5850
soilplantpestcenter@utk.edu

Mehlich 1 SOIL TEST RESULTS and RATINGS* (Pounds Per Acre)

Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536441	01/18/2017	F70	2	6.43		8 L	60 L	1302 S	67 S					
536442	01/18/2017	F70	3	6.45		14 L	68 L	1466 S	68 S					
536443	01/18/2017	F70	4	6.84		19 M	41 L	2058 S	83 S					
536444	01/18/2017	F70	5	6.63		21 M	39 L	2630 S	78 S					
536445	01/18/2017	F70	6	7.07		20 M	58 L	2548 S	79 S					
536446	01/18/2017	F70	7	7.29		29 M	151 M	2294 S	148 S					
536447	01/18/2017	F70	9	5.06	7.44	8 L	77 L	1049 S	215 S					
536448	01/18/2017	F70	11	5.82	7.57	8 L	118 M	1530 S	193 S					

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
536441	F70	2											
536442	F70	3											
536443	F70	4											
536444	F70	5											
536445	F70	6											
536446	F70	7											
536447	F70	9											
536448	F70	11											

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Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536976	01/20/2017	F-70	1	6.61		20 M	113 M	1606 S	92 S					
536977	01/20/2017	F-70	8	5.42	7.53	11 L	78 L	1386 S	289 S					
536978	01/20/2017	F-70	10	5.88	7.58	17 L	123 M	1653 S	312 S					

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
536976	F-70	1											
536977	F-70	8											
536978	F-70	10											

RECOMMENDATIONS-Fertilizer/Lime Applications and Rates

Lab Number	Farm ID	Sample Number	Crop	Nitrogen (N)	Phosphate (P2O5)	Potash (K2O)	Application Rate	Limestone	Application Rate
536976	F-70	1	Corn (150-175 BU/A)	180	70	70	pounds per acre	0	tons per acre
536976	F-70	1	Soybeans	0	20	40	pounds per acre	0	tons per acre
536977	F-70	8	Corn (150-175 BU/A)	180	140	140	pounds per acre	2	tons per acre
536977	F-70	8	Soybeans	0	40	80	pounds per acre	2	tons per acre
536978	F-70	10	Corn (150-175 BU/A)	180	140	70	pounds per acre	2	tons per acre
536978	F-70	10	Soybeans	0	40	40	pounds per acre	2	tons per acre

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Mehlich 1 SOIL TEST RESULTS and RATINGS* (Pounds Per Acre)

Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536978	01/20/2017	F-70	10	5.88	7.58	17 L	123 M	1653 S	312 S					

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
536978	F-70	10											

RECOMMENDATIONS-Fertilizer/Lime Applications and Rates

Lab Number	Farm ID	Sample Number	Crop	Nitrogen (N)	Phosphate (P2O5)	Potash (K2O)	Application Rate	Limestone	Application Rate
536978	F-70	10	Corn (150-175 BU/A)	180	140	70	pounds per acre	2	tons per acre
536978	F-70	10	Soybeans	0	40	40	pounds per acre	2	tons per acre

Sample Number: 10
On soils having a coarse textured subsoil, 10 pounds of sulfur per acre as part of the fertilizer blend may benefit yield, especially where deficiency symptoms have been observed in the past or where plant tissue tests have suggested sulfur deficiency. Split applications of nitrogen may be beneficial when nitrogen rates are greater than 120 pounds per acre. See Corn Nitrogen Rate Calculator at www.utcrops.com. If nitrogen sources containing urea are not incorporated, some loss of nitrogen may occur if applied to moist soils followed by three or more days of rapidly drying conditions without rainfall. Reduce N rate by 60 to 80 pounds per acre following a well-established single-species winter cover crop of crimson clover or hairy vetch that has reached early bloom stage. If zinc was tested and is below 2 pounds per acre, apply five pounds of zinc (approximately 15 pounds zinc sulfate) per acre just prior to planting. If zinc was not tested, apply 5 pounds of zinc (approximately 15 pounds zinc sulfate) per acre when soil pH is 6.1 or above and phosphorus is high or anytime lime is applied or anywhere zinc deficiencies were observed the previous year.

Sample Number: 10
Lime, phosphate and potash can be broadcast over the soil surface in fall, winter or spring. If soybeans follow established wheat, apply the phosphate and potash for soybeans when the wheat is topdressed with nitrogen, or at time of planting the soybeans. Nitrogen is not recommended since soybeans are legumes and when properly inoculated produce their own nitrogen. Treat soybean seed with two-tenths (0.2) ounce molybdenum per bushel when soil pH is 6.5 or below. Apply either one-half (0.5) ounce of sodium molybdate per bushel or follow the product label for liquid hopper-box applied sources containing fungicides. Where only soybeans are to be grown, lime recommended may be omitted if water pH of the soil is greater than 5.6 and if soybean seed are properly treated with molybdenum. On soils having a coarse textured subsoil, 10 pounds of sulfur per acre as part of the fertilizer blend may benefit yield, especially where deficiency symptoms have been observed in the past or where plant tissue tests have suggested sulfur deficiency.

Mehlich 1 SOIL TEST RESULTS and RATINGS* (Pounds Per Acre)														
Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536979	01/20/2017	F-72	1	6.01	7.75	57 H	182 H	1264 S	139 S					
536980	01/20/2017	F-72	2a	6.45		56 H	155 M	1876 S	214 S					
536981	01/20/2017	F-72	2b	6.36		47 H	209 H	1508 S	140 S					
536982	01/20/2017	F-72	3	6.7		44 H	159 M	1680 S	113 S					
536983	01/20/2017	F-72	4	6.24		34 H	248 H	966 S	87 S					
536984	01/20/2017	F-72	5	6.12		20 M	220 H	1227 S	78 S					
536985	01/20/2017	F-72	6	6.1		34 H	358 V	1758 S	99 S					
536986	01/20/2017	F-72	7	6.62		35 H	415 V	1541 S	120 S					
536987	01/20/2017	F-72	8	6.44		49 H	260 H	1247 S	92 S					
536988	01/20/2017	F-72	9	6.49		39 H	148 M	1579 S	84 S					
536989	01/20/2017	F-72	10	6.58		31 H	187 H	1305 S	87 S					
536990	01/20/2017	F-72	11	6.74		88 H	245 H	1539 S	136 S					
536991	01/20/2017	F-72	12	6.55		74 H	235 H	1867 S	136 S					
536992	01/20/2017	F-72	13	5.75	7.85	90 H	145 M	406 S	81 S					
536993	01/20/2017	F-72	14	6.03	7.82	85 H	176 H	593 S	107 S					
536994	01/20/2017	F-72	15	5.67	7.68	15 L	177 H	1290 S	115 S					
536995	01/20/2017	F-72	16	5.47	7.58	27 M	229 H	1257 S	136 S					
536996	01/20/2017	F-72	17	5.64	7.64	28 M	232 H	1372 S	144 S					
536997	01/20/2017	F-72	18	6.27		87 H	185 H	1990 S	149 S					
536998	01/20/2017	F-72	19	6.04	7.76	81 H	223 H	1625 S	128 S					
536999	01/20/2017	F-72	20	6.74		112 H	207 H	2051 S	125 S					
537000	01/20/2017	F-72	21	6.36		56 H	160 M	1542 S	149 S					
537001	01/20/2017	F-72	22	6.09		31 H	186 H	1503 S	139 S					
537002	01/20/2017	F-72	23	6.3		67 H	191 H	1510 S	158 S					
537003	01/20/2017	F-72	24	6.29		47 H	150 M	1335 S	111 S					
537004	01/20/2017	F-72	25	6.48		35 H	172 H	1960 S	149 S					
537005	01/20/2017	F-72	26	6.45		48 H	173 H	1664 S	138 S					
537006	01/20/2017	F-72	27	6.38		47 H	266 H	1401 S	133 S					
537007	01/20/2017	F-72	28	6.19		52 H	402 V	1292 S	164 S					
537008	01/20/2017	F-72	29	6.52		38 H	203 H	1714 S	137 S					
537009	01/20/2017	F-72	30	5.47	7.45	21 M	224 H	960 S	185 S					
537010	01/20/2017	F-72	31	6.37		39 H	275 H	1178 S	201 S					
537012	01/20/2017	F-72	32	6.3		28 M	188 H	1731 S	183 S					
537013	01/20/2017	F-72	33	6.14		27 M	285 H	1395 S	170 S					
537014	01/20/2017	F-72	34	5.62	7.66	22 M	204 H	874 S	175 S					
537015	01/20/2017	F-72	35	5.45	7.61	25 M	301 H	852 S	158 S					
537016	01/20/2017	F-72	36	6.06		46 H	195 H	1485 S	221 S					
537017	01/20/2017	F-72	37	5.56	7.67	14 L	187 H	1077 S	107 S					
537018	01/20/2017	F-72	38	6.24		18 L	257 H	838 S	134 S					
537019	01/20/2017	F-72	39	7.13		56 H	481 V	2422 S	312 S					
537020	01/20/2017	F-72	40	5.73	7.67	24 M	308 H	850 S	154 S					
537021	01/20/2017	F-72	41	5.64	7.66	27 M	300 H	734 S	151 S					

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Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
535637	01/10/2017	F77	1	6.72		14 L	157 M	2459 S	158 S					
535638	01/10/2017	F77	2	5.62	7.55	16 L	273 H	1928 S	176 S					
535639	01/10/2017	F77	3	6.45		56 H	456 V	2696 S	162 S					
535640	01/10/2017	F77	4	5.22	7.48	9 L	213 H	1861 S	229 S					
535642	01/10/2017	F77	5	5.75	7.65	7 L	253 H	1430 S	130 S					
535643	01/10/2017	F77	6	5.41	7.54	7 L	210 H	1308 S	170 S					
535644	01/10/2017	F77	7	6.81		15 L	449 V	2424 S	129 S					
535645	01/10/2017	F77	8	5.94	7.66	10 L	371 V	1464 S	112 S					
535646	01/10/2017	F77	9	5.62	7.64	7 L	145 M	1162 S	66 S					
535647	01/10/2017	F77	10	5.66	7.66	8 L	147 M	1246 S	86 S					
535648	01/10/2017	F77	11	5.68	7.64	6 L	267 H	1361 S	133 S					
535649	01/10/2017	F77	12	4.99	7.64	25 M	206 H	1529 S	184 S					
535650	01/10/2017	F77	13	6.12		7 L	158 M	2010 S	153 S					
535651	01/10/2017	F77	14	5.84	7.6	8 L	173 H	2035 S	243 S					
535652	01/10/2017	F77	15	5.74	7.53	12 L	94 M	2340 S	209 S					
535653	01/10/2017	F77	16	5.91	7.65	8 L	169 H	1642 S	144 S					
535654	01/10/2017	F77	17	5.6	7.54	36 H	81 L	1894 S	117 S					

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Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536206	01/12/2017	F78	4	6.68		18 L	124 M	2093 S	131 S					
536207	01/12/2017	F78	5	6.37		9 L	106 M	2486 S	184 S					
536208	01/12/2017	F78	6	6.94		11 L	87 L	1972 S	117 S					
536209	01/12/2017	F78	8	6.37		8 L	82 L	1871 S	96 S					
536210	01/12/2017	F78	10	6.72		23 M	109 M	3000 S	246 S					
536212	01/12/2017	F78	13	5.66	7.67	6 L	86 L	1126 S	66 S					
536213	01/12/2017	F78	14	5.67	7.52	7 L	117 M	1745 S	153 S					
536214	01/12/2017	F78	15	6.47		7 L	110 M	2278 S	216 S					
536215	01/12/2017	F78	16	6.34		5 L	68 L	2168 S	179 S					

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
536206	F78	4											
536207	F78	5											
536208	F78	6											
536209	F78	8											
536210	F78	10											
536212	F78	13											
536213	F78	14											
536214	F78	15											
536215	F78	16											

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				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536252	01/12/2017	F83	1	6.24		21 M	132 M	1365 S	112 S					
536253	01/12/2017	F83	2	6.65		11 L	185 H	2227 S	238 S					
536254	01/12/2017	F83	3	6.16		13 L	157 M	1946 S	275 S					
536255	01/12/2017	F83	4	5.77	7.69	21 M	97 M	1281 S	108 S					
536256	01/12/2017	F83	5	6.25		17 L	133 M	1823 S	180 S					
536257	01/12/2017	F83	6	6.03	7.67	24 M	141 M	1433 S	158 S					
536258	01/12/2017	F83	7	6.68		13 L	78 L	1910 S	186 S					
536259	01/12/2017	F83	8	6.5		13 L	107 M	1863 S	204 S					
536260	01/12/2017	F83	9	6.17		35 H	133 M	1706 S	176 S					
536261	01/12/2017	F83	10	6.38		27 M	153 M	1610 S	144 S					
536262	01/12/2017	F83	11	6.52		14 L	108 M	1721 S	223 S					
536263	01/12/2017	F83	12	6.58		37 H	104 M	1501 S	161 S					
536264	01/12/2017	F83	13	6.43		33 H	71 L	1499 S	97 S					
536265	01/12/2017	F83	14	7.12		26 M	156 M	2527 S	226 S					
536266	01/12/2017	F83	15	6.51		13 L	68 L	1464 S	125 S					
536267	01/12/2017	F83	16	6.45		38 H	161 H	1409 S	151 S					
536268	01/12/2017	F83	17	6.47		34 H	143 M	1493 S	154 S					
536269	01/12/2017	F83	18	6.14		23 M	121 M	1751 S	200 S					
536270	01/12/2017	F83	19	5.77	7.66	41 H	147 M	1164 S	134 S					
536271	01/12/2017	F83	20	6.36		20 M	176 H	1601 S	200 S					
536272	01/12/2017	F83	21	6.96		23 M	90 L	2100 S	229 S					
536273	01/12/2017	F83	22	5.82	7.64	25 M	63 L	1309 S	128 S					
536274	01/12/2017	F83	23	5.92	7.68	19 M	86 L	1309 S	101 S					
536275	01/12/2017	F83	24	7.51		59 H	145 M	2612 S	300 S					
536276	01/12/2017	F83	25	6.34		19 M	136 M	1806 S	179 S					
536277	01/12/2017	F83	26	6.44		34 H	135 M	1540 S	155 S					
536278	01/12/2017	F83	27	5.71	7.64	55 H	208 H	1148 S	114 S					
536279	01/12/2017	F83	28	6.57		65 H	182 H	1789 S	148 S					
536280	01/12/2017	F83	29	6.78		18 L	154 M	2190 S	242 S					
536281	01/12/2017	F83	30	6.77		9 L	73 L	1699 S	125 S					
536282	01/12/2017	F83	31	6.81		40 H	140 M	1572 S	134 S					

536283	01/12/2017	F83	32	6.45		21 M	103 M	1396 S	102 S
536284	01/12/2017	F83	33	6.51		13 L	83 L	1775 S	166 S
536285	01/12/2017	F83	34	6.92		60 H	115 M	2986 S	202 S
536286	01/12/2017	F83	35	6.53		33 H	121 M	1858 S	152 S
536287	01/12/2017	F83	36	6.18		46 H	133 M	1536 S	95 S
536288	01/12/2017	F83	37	6.87		15 L	134 M	2278 S	199 S
536289	01/12/2017	F83	38	5.17	7.69	6 L	88 L	629 S	55 S
536290	01/12/2017	F83	39	5.56	7.69	9 L	85 L	1067 S	79 S
536292	01/12/2017	F83	40	5.17	7.67	12 L	68 L	919 S	59 S
536293	01/12/2017	F83	41	5.79	7.65	8 L	62 L	1233 S	86 S
536294	01/12/2017	F83	42	5.36	7.72	26 M	92 M	844 S	56 S
536295	01/12/2017	F83	43	5.77	7.68	44 H	51 L	1575 S	120 S
536296	01/12/2017	F83	44	5.66	7.57	15 L	88 L	1978 S	298 S
536297	01/12/2017	F83	45	5.85	7.56	36 H	134 M	2196 S	349 S
536298	01/12/2017	F83	46	6.64		60 H	181 H	2599 S	377 S
536299	01/12/2017	F83	47	6.12		28 M	80 L	1764 S	177 S
536300	01/12/2017	F83	48	7.51		39 H	174 H	5807 S	324 S
536301	01/12/2017	F83	49	5.77	7.63	8 L	278 H	1954 S	272 S
536302	01/12/2017	F83	50	5.87	7.6	15 L	151 M	1691 S	210 S
536303	01/12/2017	F83	51	6.22		12 L	158 M	1910 S	258 S
536304	01/12/2017	F83	52	5.98	7.78	22 M	45 L	1416 S	83 S
536305	01/12/2017	F83	53	5.85	7.56	8 L	122 M	1880 S	317 S
536306	01/12/2017	F83	54	6.33		23 M	135 M	1939 S	227 S
536307	01/12/2017	F83	55	5.85	7.6	62 H	201 H	1676 S	361 S
536308	01/12/2017	F83	56	5.86	7.67	44 H	122 M	1562 S	210 S
536309	01/12/2017	F83	57	6.17		63 H	181 H	1970 S	258 S
536310	01/12/2017	F83	58	6.31		19 M	158 M	1757 S	180 S
536311	01/12/2017	F83	59	6.24		37 H	106 M	1936 S	219 S
536312	01/12/2017	F83	60	7.37		57 H	272 H	2201 S	160 S
536313	01/12/2017	F83	61	6.22		41 H	166 H	2076 S	261 S
536314	01/12/2017	F83	62	6.43		24 M	114 M	1708 S	185 S
536315	01/12/2017	F83	63	6.12		23 M	150 M	2152 S	328 S
536316	01/12/2017	F83	64	6.55		25 M	117 M	1934 S	219 S
536317	01/12/2017	F83	65	5.96	7.62	73 H	243 H	1890 S	245 S
536318	01/12/2017	F83	66	6.31		53 H	150 M	1884 S	205 S
536319	01/12/2017	F83	67	5.92	7.68	18 L	177 H	1513 S	127 S
536320	01/12/2017	F83	68	6.14		21 M	180 H	1604 S	115 S
536321	01/12/2017	F83	69	6.03	7.59	19 M	123 M	1890 S	339 S
536322	01/12/2017	F83	70	6.25		15 L	112 M	2258 S	308 S
536323	01/12/2017	F83	71	6	7.63	51 H	251 H	2334 S	201 S
536324	01/12/2017	F83	72	5.81	7.66	17 L	124 M	1470 S	166 S
536325	01/12/2017	F83	73	5.8	7.71	9 L	80 L	1395 S	136 S
536326	01/12/2017	F83	74	5.76	7.67	15 L	115 M	1602 S	162 S
536327	01/12/2017	F83	75	5.96	7.57	14 L	139 M	2232 S	281 S
536328	01/12/2017	F83	76	6.78		42 H	200 H	2880 S	300 S
536329	01/12/2017	F83	77	6.26		15 L	156 M	1780 S	219 S
536330	01/12/2017	F83	78	6.41		17 L	314 H	1998 S	287 S
536332	01/18/2017	F83	79	6.39		29 M	325 V	1612 S	160 S
536333	01/18/2017	F83	80	5.7	7.61	20 M	217 H	1354 S	202 S
536334	01/18/2017	F83	81	5.78	7.57	11 L	155 M	1521 S	247 S

536335	01/18/2017	F83	82	6.46		28 M	241 H	2537 S	221 S
536336	01/18/2017	F83	83	6.8		24 M	212 H	2623 S	218 S
536337	01/18/2017	F83	84	7.08		12 L	185 H	2618 S	201 S
536338	01/18/2017	F83	85	6.52		26 M	113 M	1769 S	144 S
536339	01/18/2017	F83	86	6.83		15 L	165 H	2434 S	212 S
536340	01/18/2017	F83	87	6.32		10 L	128 M	2133 S	267 S
536341	01/18/2017	F83	88	6.05		79 H	184 H	1910 S	217 S
536342	01/18/2017	F83	89	6.02	7.65	20 M	155 M	1524 S	158 S
536343	01/18/2017	F83	90	5.48	7.6	61 H	230 H	966 S	112 S
536344	01/18/2017	F83	91	5.71	7.65	41 H	101 M	1296 S	110 S
536345	01/18/2017	F83	92	7.02		66 H	113 M	3288 S	210 S
536346	01/18/2017	F83	93	7.24		34 H	150 M	2357 S	159 S
536347	01/18/2017	F83	94	7.17		75 H	312 H	3795 S	205 S
536348	01/18/2017	F83	95	6.57		42 H	189 H	2101 S	175 S

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
536252	F83	1											
536253	F83	2											
536254	F83	3											
536255	F83	4											
536256	F83	5											
536257	F83	6											
536258	F83	7											
536259	F83	8											
536260	F83	9											
536261	F83	10											
536262	F83	11											
536263	F83	12											
536264	F83	13											
536265	F83	14											
536266	F83	15											
536267	F83	16											
536268	F83	17											
536269	F83	18											
536270	F83	19											
536271	F83	20											
536272	F83	21											
536273	F83	22											
536274	F83	23											
536275	F83	24											
536276	F83	25											
536277	F83	26											
536278	F83	27											
536279	F83	28											
536280	F83	29											
536281	F83	30											
536282	F83	31											
536283	F83	32											
536284	F83	33											

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Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
517837	02/01/2016		F8911	6.44		23 M	198 H	1751 S	124 S					
517838	02/01/2016		F8912	6.39		60 H	190 H	2127 S	216 S					
517839	02/01/2016		F8913	6.27		9 L	172 H	2265 S	277 S					
517840	02/01/2016		F8914	5.6	7.59	7 L	133 M	1729 S	214 S					
517842	02/01/2016		F8915	5.85	7.53	13 L	137 M	2362 S	241 S					
517843	02/01/2016		F8916	5.74	7.64	36 H	161 H	1324 S	129 S					
517844	02/01/2016		F8933	5.97	7.68	46 H	151 M	1616 S	94 S					
517845	02/01/2016		F891	6.35		26 M	189 H	2408 S	241 S					
517846	02/01/2016		F892	5.93	7.57	10 L	140 M	1940 S	384 S					
517847	02/01/2016		F893	6.12		14 L	236 H	1910 S	207 S					
517848	02/01/2016		F894	6.43		25 M	202 H	1748 S	109 S					
517849	02/01/2016		F895	6.32		15 L	227 H	1724 S	135 S					
517850	02/01/2016		F896	6.37		8 L	176 H	1973 S	194 S					
517851	02/01/2016		F897	6.15		21 M	189 H	1842 S	127 S					
517852	02/01/2016		F898	6.63		16 L	167 H	1918 S	152 S					
517853	02/01/2016		F899	5.24	7.63	67 H	196 H	836 S	93 S					
517854	02/01/2016		F8910	6.35		22 M	215 H	2576 S	254 S					

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Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536369	01/18/2017	F99	1	5.87	7.57	7 L	113 M	2105 S	163 S					
536370	01/18/2017	F99	2	5.25	7.57	11 L	61 L	1087 S	73 S					
536372	01/18/2017	F99	3	5.91	7.64	26 M	149 M	1413 S	86 S					
536373	01/18/2017	F99	4	6.14		10 L	66 L	1348 S	81 S					
536374	01/18/2017	F99	5	5.73	7.61	8 L	103 M	1511 S	122 S					
536375	01/18/2017	F99	6	5.44	7.53	8 L	111 M	1500 S	134 S					
536376	01/18/2017	F99	7	5.6	7.56	19 M	116 M	1496 S	145 S					
536377	01/18/2017	F99	8	6.09		12 L	128 M	2373 S	228 S					
536378	01/18/2017	F99	9	5.67	7.48	15 L	105 M	2078 S	202 S					
536379	01/18/2017	F99	10	5.41	7.48	11 L	83 L	1587 S	124 S					
536380	01/18/2017	F99	11	5.45	7.54	13 L	119 M	1229 S	101 S					
536381	01/18/2017	F99	12	5.86	7.64	36 H	213 H	1577 S	128 S					
536382	01/18/2017	F99	13	5.61	7.55	7 L	113 M	1657 S	136 S					
536383	01/18/2017	F99	14	5.56	7.54	9 L	146 M	1520 S	128 S					
536384	01/18/2017	F99	15	5.99	7.65	14 L	106 M	1379 S	85 S					
536385	01/18/2017	F99	16	5.81	7.55	15 L	170 H	1727 S	146 S					
536386	01/18/2017	F99	17	5.67	7.57	11 L	145 M	1468 S	106 S					
536387	01/18/2017	F99	18	5.5	7.57	8 L	175 H	1335 S	100 S					
536388	01/18/2017	F99	19	6.08		7 L	86 L	1822 S	132 S					
536389	01/18/2017	F99	20	6.41		10 L	122 M	2360 S	214 S					
536390	01/18/2017	F99	21	6.08		30 M	132 M	2528 S	221 S					
536391	01/18/2017	F99	22	5.99	7.72	7 L	113 M	1633 S	109 S					
536392	01/18/2017	F99	23	5.77	7.55	10 L	131 M	2092 S	220 S					
536393	01/18/2017	F99	24	6.14		12 L	86 L	1600 S	93 S					

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Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536369	01/18/2017	F99	1	5.87	7.57	7 L	113 M	2105 S	163 S					
536370	01/18/2017	F99	2	5.25	7.57	11 L	61 L	1087 S	73 S					
536372	01/18/2017	F99	3	5.91	7.64	26 M	149 M	1413 S	86 S					
536373	01/18/2017	F99	4	6.14		10 L	66 L	1348 S	81 S					
536374	01/18/2017	F99	5	5.73	7.61	8 L	103 M	1511 S	122 S					
536375	01/18/2017	F99	6	5.44	7.53	8 L	111 M	1500 S	134 S					
536376	01/18/2017	F99	7	5.6	7.56	19 M	116 M	1496 S	145 S					
536377	01/18/2017	F99	8	6.09		12 L	128 M	2373 S	228 S					
536378	01/18/2017	F99	9	5.67	7.48	15 L	105 M	2078 S	202 S					
536379	01/18/2017	F99	10	5.41	7.48	11 L	83 L	1587 S	124 S					
536380	01/18/2017	F99	11	5.45	7.54	13 L	119 M	1229 S	101 S					
536381	01/18/2017	F99	12	5.86	7.64	36 H	213 H	1577 S	128 S					
536382	01/18/2017	F99	13	5.61	7.55	7 L	113 M	1657 S	136 S					
536383	01/18/2017	F99	14	5.56	7.54	9 L	146 M	1520 S	128 S					
536384	01/18/2017	F99	15	5.99	7.65	14 L	106 M	1379 S	85 S					
536385	01/18/2017	F99	16	5.81	7.55	15 L	170 H	1727 S	146 S					
536386	01/18/2017	F99	17	5.67	7.57	11 L	145 M	1468 S	106 S					
536387	01/18/2017	F99	18	5.5	7.57	8 L	175 H	1335 S	100 S					
536388	01/18/2017	F99	19	6.08		7 L	86 L	1822 S	132 S					
536389	01/18/2017	F99	20	6.41		10 L	122 M	2360 S	214 S					
536390	01/18/2017	F99	21	6.08		30 M	132 M	2528 S	221 S					
536391	01/18/2017	F99	22	5.99	7.72	7 L	113 M	1633 S	109 S					
536392	01/18/2017	F99	23	5.77	7.55	10 L	131 M	2092 S	220 S					
536393	01/18/2017	F99	24	6.14		12 L	86 L	1600 S	93 S					

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Mehlich 1 SOIL TEST RESULTS and RATINGS* (Pounds Per Acre)

Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
516303	01/26/2016		F141-1	6.35		31 H	101 M	1511 S	130 S					
516304	01/26/2016		F141-2	6.15		39 H	122 M	2011 S	245 S					
516305	01/26/2016		F141-3	5.83	7.8	17 L	93 M	1884 S	180 S					
516306	01/26/2016		F141-4	6.34		22 M	125 M	1515 S	121 S					
516307	01/26/2016		F141-6	5.56	7.71	22 M	85 L	1211 S	114 S					
516308	01/26/2016		F141-7	5.69	7.7	25 M	140 M	1311 S	101 S					
516309	01/26/2016		F141-8	6.19		25 M	153 M	1727 S	121 S					
516310	01/26/2016		F141-9	6.94		22 M	97 M	2087 S	127 S					
516311	01/26/2016		F141-10	6.8		32 H	135 M	2082 S	123 S					
516312	01/26/2016		F141-12	5.54	7.66	12 L	91 M	1461 S	180 S					
516313	01/26/2016		F141-13	6.58		16 L	71 L	1705 S	173 S					
516314	01/26/2016		F141-14	5.64	7.67	14 L	77 L	1668 S	185 S					
516315	01/26/2016		F141-15	6.17		23 M	141 M	1580 S	166 S					
516316	01/26/2016		F141-16	5.91	7.73	19 M	234 H	1294 S	159 S					
516317	01/26/2016		F141-18	5.65	7.7	24 M	106 M	1597 S	162 S					
516318	01/26/2016		F141-19	5.83	7.79	41 H	102 M	1358 S	103 S					
516319	01/26/2016		F141-20	5.94	7.69	18 L	163 H	2014 S	224 S					
516320	01/26/2016		F141-21	6.77		41 H	257 H	2477 S	140 S					

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Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
536532	01/18/2017	F162	7	5.17	7.67	15 L	105 M	887 S	100 S					
536533	01/18/2017	F162	9	5.4	7.56	16 L	105 M	1147 S	154 S					
536534	01/18/2017	F162	12	5.3	7.58	11 L	53 L	1484 S	161 S					
536535	01/18/2017	F162	13	5.66	7.62	6 L	45 L	1278 S	165 S					
536536	01/18/2017	F162	15	6.57		10 L	118 M	2339 S	152 S					
536537	01/18/2017	F162	20	6.82		24 M	117 M	2933 S	164 S					
536538	01/18/2017	F162	27	6.22		19 M	93 M	2011 S	136 S					
536539	01/18/2017	F106	5	6.26		20 M	115 M	1679 S	95 S					
536540	01/18/2017	F106	13	6.1		21 M	112 M	2201 S	207 S					
536541	01/18/2017	F162	1	5.22	7.7	37 H	125 M	389 S	67 S					
536542	01/18/2017	F162	2	5	7.49	11 L	80 L	1175 S	199 S					
536543	01/18/2017	F162	3	5.7	7.63	9 L	64 L	1273 S	139 S					
536544	01/18/2017	F162	4	5.37	7.65	12 L	111 M	1127 S	93 S					
536545	01/18/2017	F162	5	5.77	7.61	13 L	52 L	1383 S	180 S					
536546	01/18/2017	F162	6	5.86	7.73	10 L	166 H	1267 S	102 S					
536547	01/18/2017	F162	8	5.63	7.68	13 L	50 L	1152 S	104 S					
536548	01/18/2017	F162	10	5.43	7.65	5 L	52 L	1308 S	128 S					
536549	01/18/2017	F162	11	5.35	7.5	16 L	106 M	1349 S	199 S					
536550	01/18/2017	F162	13	5.85	7.67	16 L	62 L	1556 S	121 S					
536551	01/18/2017	F162	14	5.56	7.6	13 L	121 M	1473 S	165 S					
536552	01/18/2017	F162	15	5.32	7.51	13 L	184 H	1780 S	219 S					
536553	01/18/2017	F162	16	5.6	7.63	13 L	151 M	1302 S	113 S					
536554	01/18/2017	F162	17	5.18	7.68	10 L	49 L	967 S	120 S					
536555	01/18/2017	F162	18	5.59	7.67	7 L	34 L	1158 S	128 S					
536556	01/18/2017	F162	19	5.97	7.65	15 L	60 L	1931 S	210 S					
536557	01/18/2017	F162	20	5.22	7.67	22 M	46 L	816 S	149 S					
536558	01/18/2017	F162	21	4.97	7.63	17 L	46 L	1239 S	157 S					
536559	01/18/2017	F162	22	5.13	7.46	9 L	78 L	1161 S	289 S					
536560	01/18/2017	F162	23	5.72	7.7	9 L	40 L	1452 S	130 S					

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Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
514398	12/31/2015		F175-1	5.61	7.61	29 M	204 H	1451 S	171 S					
514399	12/31/2015		F175-2	6.54		46 H	174 H	2549 S	227 S					
514400	12/31/2015		F175-3	5.26	7.53	10 L	75 L	1570 S	261 S					
514402	12/31/2015		F175-4	6.18		12 L	82 L	1756 S	162 S					
514403	12/31/2015		F175-7	6		11 L	103 M	1904 S	227 S					
514404	12/31/2015		F175-9	5.97	7.68	8 L	55 L	1860 S	179 S					
514405	12/31/2015		F175-10	5.58	7.61	7 L	136 M	1416 S	217 S					

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
514398		F175-1											
514399		F175-2											
514400		F175-3											
514402		F175-4											
514403		F175-7											
514404		F175-9											
514405		F175-10											

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Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
514362	12/31/2015		F175-8	5.63	7.62	22 M	205 H	1656 S	231 S					

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
514362		F175-8											

RECOMMENDATIONS-Fertilizer/Lime Applications and Rates

Lab Number	Farm ID	Sample Number	Crop	Nitrogen (N)	Phosphate (P2O5)	Potash (K2O)	Application Rate	Limestone	Application Rate
514362		F175-8	Corn (150-175 BU/A)	180	70	0	pounds per acre	2	tons per acre
514362		F175-8	Soybeans	0	20	0	pounds per acre	2	tons per acre

Sample Number: F175-8
On soils having a coarse textured subsoil, 10 pounds of sulfur per acre as part of the fertilizer blend may benefit yield, especially where deficiency symptoms have been observed in the past or where plant tissue tests have suggested sulfur deficiency. Split applications of nitrogen may be beneficial when nitrogen rates are greater than 120 pounds per acre. See Corn Nitrogen Rate Calculator at www.utcrops.com. If nitrogen sources containing urea are not incorporated, some loss of nitrogen may occur if applied to moist soils followed by three or more days of rapidly drying conditions without rainfall. Reduce N rate by 60 to 80 pounds per acre following a well-established single-species winter cover crop of crimson clover or hairy vetch that has reached early bloom stage. If zinc was tested and is below 2 pounds per acre, apply five pounds of zinc (approximately 15 pounds zinc sulfate) per acre just prior to planting. If zinc was not tested, apply 5 pounds of zinc (approximately 15 pounds zinc sulfate) per acre when soil pH is 6.1 or above and phosphorus is high or anytime lime is applied or anywhere zinc deficiencies were observed the previous year.

Sample Number: F175-8
Lime, phosphate and potash can be broadcast over the soil surface in fall, winter or spring. If soybeans follow established wheat, apply the phosphate and potash for soybeans when the wheat is topdressed with nitrogen, or at time of planting the soybeans. Nitrogen is not recommended since soybeans are legumes and when properly inoculated produce their own nitrogen. Treat soybean seed with two-tenths (0.2) ounce molybdenum per bushel when soil pH is 6.5 or below. Apply either one-half (0.5) ounce of sodium molybdate per bushel or follow the product label for liquid hopper-box applied sources containing fungicides. Where only soybeans are to be grown, lime recommended may be omitted if water pH of the soil is greater than 5.6 and if soybean seed are properly treated with molybdenum. On soils having a coarse textured subsoil, 10 pounds of sulfur per acre as part of the fertilizer blend may benefit yield, especially where deficiency symptoms have been observed in the past or where plant tissue tests have suggested sulfur deficiency.

UTEXTENSION
INSTITUTE OF AGRICULTURE
THE UNIVERSITY OF TENNESSEE

SOIL TEST REPORT

. TOSH FARMS
1586 ATLANTIC AVENUE
HENRY TN 38231

County: Henry

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Mehlich 1 SOIL TEST RESULTS and RATINGS* (Pounds Per Acre)

Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
514964	02/22/2016		F200-1	6.1		29 M	199 H	2440 S	222 S					
514965	02/22/2016		F200-2	6.66		30 M	133 M	2178 S	172 S					
514966	02/22/2016		F200-3	5.41	7.49	12 L	128 M	1489 S	210 S					
514967	02/22/2016		F200-4	5.72	7.61	54 H	220 H	2048 S	163 S					
514968	02/22/2016		F200-5	7.13		235 V	362 V	3404 S	140 S					
514969	02/22/2016		F200-6	6.79		20 M	114 M	2765 S	261 S					
514970	02/22/2016		F200-7	5.65	7.52	14 L	107 M	1983 S	240 S					
514971	02/22/2016		F200-8	6.43		21 M	64 L	1976 S	185 S					
514972	02/22/2016		F200-9	6.28		10 L	121 M	1378 S	111 S					
514973	02/22/2016		F200-10	6.41		49 H	127 M	1653 S	81 S					
514974	02/22/2016		F200-11	5.95	7.69	14 L	150 M	1667 S	136 S					
514975	02/22/2016		F200-12	5.95	7.67	53 H	228 H	1758 S	184 S					
514976	02/22/2016		F200-13	6.1		17 L	49 L	1968 S	201 S					
514977	02/22/2016		F200-14	6.85		16 L	70 L	2401 S	220 S					
514978	02/22/2016		F200-15	5.93	7.61	53 H	278 H	1676 S	267 S					
514979	02/22/2016		F200-16	5.94	7.57	22 M	157 M	2005 S	289 S					
514980	02/22/2016		F200-17	5.45	7.53	22 M	125 M	1447 S	236 S					
514981	02/22/2016		F200-18	5.56	7.56	9 L	105 M	1591 S	211 S					
514982	02/22/2016		F200-19	6.1		66 H	109 M	1695 S	117 S					
514983	02/22/2016		F200-20	5.64	7.67	27 M	53 L	1274 S	152 S					

Tennessee Phosphorus Index

Operation: Herrondale Sow Farm ***County:*** Henry ***Plan Saved:*** 12/28/2017
Plan File: Herron Dale Sow Unit.mmp ***State:*** Tennessee ***Init. File Rev:*** 4/6/2015
Plan Folder: \\Jt\i\CNMP NMP\Tosh\Henry Sow Unit\2017 ***Soils File Rev:*** 1/11/2016

Field	Crop Year	Site Total	Management Total	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
Taylor Bro (83)	2018	11	18	11	198	Medium
Taylor Bro (83)	2019	11	16	11	176	Medium
Taylor Bro (83)	2020	11	17	11	187	Medium
Taylor Bro (83)	2021	12	16	12	192	Medium
Taylor Bro (83)	2022	11	14	11	154	Medium
Taylor Bro (2)	2018	11	24	11	264	Medium
Taylor Bro (2)	2019	11	19	11	209	Medium
Taylor Bro (2)	2020	11	24	11	264	Medium
Taylor Bro (2)	2021	11	19	11	209	Medium
Taylor Bro (2)	2022	11	12	11	132	Low
Taylor Bro (3)	2018	11	24	11	264	Medium
Taylor Bro (3)	2019	11	19	11	209	Medium
Taylor Bro (3)	2020	11	24	11	264	Medium
Taylor Bro (3)	2021	11	19	11	209	Medium
Taylor Bro (3)	2022	11	12	11	132	Low
Taylor Bro (4)	2018	11	17	11	187	Medium
Taylor Bro (4)	2019	11	16	11	176	Medium
Taylor Bro (4)	2020	11	17	11	187	Medium
Taylor Bro (4)	2021	11	16	11	176	Medium
Taylor Bro (4)	2022	11	18	11	198	Medium
J Aldridge (37)	2018	11	19	11	209	Medium
J Aldridge (37)	2019	11	15	11	165	Medium
J Aldridge (37)	2020	11	19	11	209	Medium
J Aldridge (37)	2021	11	24	11	264	Medium
J Aldridge (37)	2022	11	19	11	209	Medium
Tosh Clark (99)	2018	11	19	11	209	Medium
Tosh Clark (99)	2019	11	16	11	176	Medium
Tosh Clark (99)	2020	11	19	11	209	Medium
Tosh Clark (99)	2021	11	24	11	264	Medium
Tosh Clark (99)	2022	11	19	11	209	Medium
Webb Hart (78)	2018	11	19	11	209	Medium
Webb Hart (78)	2019	11	13	11	143	Medium
Webb Hart (78)	2020	11	19	11	209	Medium
Webb Hart (78)	2021	11	24	11	264	Medium
Webb Hart (78)	2022	11	19	11	209	Medium
Prosser (77)	2018	11	16	11	176	Medium
Prosser (77)	2019	11	12	11	132	Low
Prosser (77)	2020	11	15	11	165	Medium

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Field	Crop Year	Site Total	Management Total	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
Prosser (77)	2021	11	18	11	198	Medium
Prosser (77)	2022	12	16	12	192	Medium
Morris Stroup (89)	2018	11	16	11	176	Medium
Morris Stroup (89)	2019	11	19	11	209	Medium
Morris Stroup (89)	2020	11	16	11	176	Medium
Morris Stroup (89)	2021	11	14	11	154	Medium
Morris Stroup (89)	2022	11	14	11	154	Medium
Tosh Chunn (141)	2018	11	16	11	176	Medium
Tosh Chunn (141)	2019	11	17	11	187	Medium
Tosh Chunn (141)	2020	11	16	11	176	Medium
Tosh Chunn (141)	2021	11	13	11	143	Medium
Tosh Chunn (141)	2022	11	14	11	154	Medium
Jamey Tosh (47)	2018	11	19	11	209	Medium
Jamey Tosh (47)	2019	11	24	11	264	Medium
Jamey Tosh (47)	2020	11	19	11	209	Medium
Jamey Tosh (47)	2021	11	23	11	253	Medium
Jamey Tosh (47)	2022	11	19	11	209	Medium
Tosh Milam (70)	2018	11	24	11	264	Medium
Tosh Milam (70)	2019	11	19	11	209	Medium
Tosh Milam (70)	2020	11	24	11	264	Medium
Tosh Milam (70)	2021	11	19	11	209	Medium
Tosh Milam (70)	2022	11	24	11	264	Medium
Tosh Car Hopper (161)	2018	11	19	11	209	Medium
Tosh Car Hopper (161)	2019	11	24	11	264	Medium
Tosh Car Hopper (161)	2020	11	19	11	209	Medium
Tosh Car Hopper (161)	2021	11	23	11	253	Medium
Tosh Car Hopper (161)	2022	11	19	11	209	Medium
Milam Carothers (69)	2018	11	4	22	44	Low
Milam Carothers (69)	2019	11	4	22	44	Low
Milam Carothers (69)	2020	11	5	22	55	Low
Milam Carothers (69)	2021	11	4	22	44	Low
Milam Carothers (69)	2022	11	4	22	44	Low
Carothers CBAR (113)	2018	11	4	22	44	Low
Carothers CBAR (113)	2019	11	4	22	44	Low
Carothers CBAR (113)	2020	11	4	22	44	Low
Carothers CBAR (113)	2021	11	4	22	44	Low
Carothers CBAR (113)	2022	11	4	22	44	Low
Pete Desocio (175)	2018	11	17	11	187	Medium
Pete Desocio (175)	2019	11	16	11	176	Medium

Tennessee Phosphorus Index

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Field	Crop Year	Site Total	Management Total	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
Pete Desocio (175)	2020	11	12	11	132	Low
Pete Desocio (175)	2021	11	15	11	165	Medium
Pete Desocio (175)	2022	11	17	11	187	Medium
Pete Desocio (200)	2018	11	4	22	44	Low
Pete Desocio (200)	2019	11	4	22	44	Low
Pete Desocio (200)	2020	11	14	22	154	Medium
Pete Desocio (200)	2021	11	4	22	44	Low
Pete Desocio (200)	2022	11	4	22	44	Low
Henry Sow Unit (72)	2018	11	4	22	44	Low
Henry Sow Unit (72)	2019	11	4	22	44	Low
Henry Sow Unit (72)	2020	11	14	22	154	Medium
Henry Sow Unit (72)	2021	11	4	22	44	Low
Henry Sow Unit (72)	2022	11	4	22	44	Low
Robinson Car (65)	2018	11	19	11	209	Medium
Robinson Car (65)	2019	11	24	11	264	Medium
Robinson Car (65)	2020	11	19	11	209	Medium
Robinson Car (65)	2021	11	24	11	264	Medium
Robinson Car (65)	2022	11	19	11	209	Medium
Pete Desocio (18A)	2018	11	4	22	44	Low
Pete Desocio (18A)	2019	11	4	22	44	Low
Pete Desocio (18A)	2020	11	16	22	176	Medium
Pete Desocio (18A)	2021	11	4	22	44	Low
Pete Desocio (18A)	2022	11	4	22	44	Low
Pete Desocio (18B)	2018	11	4	22	44	Low
Pete Desocio (18B)	2019	11	4	22	44	Low
Pete Desocio (18B)	2020	11	16	22	176	Medium
Pete Desocio (18B)	2021	11	4	22	44	Low
Pete Desocio (18B)	2022	11	4	22	44	Low