

State Specific TSP Training Module for **Kentucky**

December 2014

Purpose of this Module

This module will provide some general information that TSPs need to conduct conservation planning in our state. This information is general in nature so the TSP may need to follow up with additional reading or training to make sure they have the knowledge, skill, licenses and certifications to conduct conservation planning in this state.

Review of State Laws

This state does not require that the competence of all nutrient management planners be certified by the State Department of Conservation to write Kentucky Agricultural Water Quality Plans and Kentucky State Nutrient Management Plans.

http://www.bae.uky.edu/awqpt/PDFs/KAWQ_Plan-Revised_2014.pdf

(Manure application setback requirements are listed on page 202 and 203.)

<http://www.bae.uky.edu/awqpt/default.htm>

To write a CNMP (CAP-102) or a (CAP-104) Nutrient Management Plan you have to be certified through the Natural Resources Conservation Service.

List of Kentucky Nutrient Management Planning Guidelines and Planning tools

Kentucky Agriculture Water Quality Act Planning Tool:

<http://www.bae.uky.edu/awqpt/calculators.htm>

Nutrient Management in Kentucky IP-71:

<http://www2.ca.uky.edu/agc/pubs/ip/ip71/ip71.pdf>

The Kentucky Agriculture Water Quality Plan:

[http://conservation.ky.gov/AWQA%20Documents/Kentucky%20Ag%20Water%20Quality%20Plan%20\(Revised%202014\).pdf](http://conservation.ky.gov/AWQA%20Documents/Kentucky%20Ag%20Water%20Quality%20Plan%20(Revised%202014).pdf)

Kentucky Nutrient Management Planning Guidelines (KyNMP):

http://dept.ca.uky.edu/agc/pub_area.asp?area=ANR

Kentucky Nutrient Management Planning Guidelines (KyNMP)

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COOPERATIVE EXTENSION SERVICE

UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT, LEXINGTON, KY, 40546

ID-211

Table A. Manure Application Setback Distances

Setback Feature	Liquid Manure Operations			Dry Manure Operations	
	Barn or Lagoon	Land Application Distance ^a		Barn and/or Manure Storage Structure (Facilities)	Land Application Distance ^a
		Injection/Incorporation	Other Method		
Lake, river, stream (a defined channel with flow three months or more of the year), spring, or karst feature (e.g. sinkhole, depression, etc.)	150 feet	35 ^c or 75 feet	50 ^c or 100 feet	150 feet	35 ^c or 75 feet
Water well ^b	300 feet	75 ^c or 150 feet	75 ^c or 150 feet	300 feet	50 ^c or 100 feet

^a Measured from the edge of the barn, lagoon, or land application area to the nearest edge of the setback feature.

^b Existing at the time the first animal feeding operation permit is issued.

^c Utilizing one or more of the following BMPs: Vegetative or forest buffer, cover crops, no-till, contouring, or terracing.

Kentucky No Discharge Operating Permit Holders

Producers obtaining a Kentucky No Discharge Operating Permit (KNDOP) must utilize setbacks and siting criteria in Table B below as described by the Kentucky Division of Water:

The following siting criteria applies to all land application areas and to all new barns and lagoons.

Table B. Setbacks and Siting Criteria

Setback Feature ¹	Barn or Lagoon	Land Application Area	
		Injection	Other Method
Dwelling not owned by applicant, church, school, school-yard, business, park or other structure to which the general public has access ²	1,500 feet	500 feet	1,000 feet
Incorporated city limit ^{2,3}	3,000 feet	1,000 feet	2,000 feet
Lake, river, blue-line stream or karst feature	150 feet	75 feet	150 feet
Water well not owned by applicant ²	300 feet	150 feet	150 feet
Downstream ⁴ water listed as Outstanding State Resource Water, Outstanding National Resource Water or Exceptional Water ⁵	1 mile	750 feet	1,500 feet
Downstream ⁴ public water supply surface water intake	5 miles	1 mile	1 mile
Roadways, primary (state and federal) ²	150 feet	75 feet	150 feet
Roadways, secondary (county) ²	150 feet	75 feet	150 feet

¹ Measured from the edge of the barn, lagoon, or land application area to the nearest edge of the setback feature.

² Existing at the time the first animal feeding operation permit is issued.

³ For existing operations, land application setbacks do not apply to city limits.

⁴ Measured along gradient.

⁵ Designated Outstanding State Resource Waters (OSRWs) are listed in 401 KAR 10:026, Section 5. Outstanding National Resource Waters (ONRWs) and Exceptional Waters (EWs) are listed in 10:030, Section 1.

Review of State FOTG Requirements

Vegetative Practices

- For 393 Filter strip or 635 Vegetated treatment area practice standards and guidelines go to:

<http://efotg.sc.egov.usda.gov/treemenuFS.aspx>

Go to Section IV. Conservation practices and scroll down to the Filter strip or to the Vegetated treatment area folders.

Review of Important Resource Issues

Kentucky has many beef feedlots that not meet the state nutrient management regulations and water quality standards.

About 200 small dairies with dry manure system have a “straight pipe” to discharge the milkhouse waste water into a road ditch or a creek.

Many farms have high Phosphorus soil test results and the new Kentucky Phosphorus Index will help planners to draw down these Phosphorus built up levels with better manure distribution on the farm.

Review of Major Land Uses or Agronomic Practices

This state is roughly 25% forest land and 50% cropland. About 30% of the cropland acres are managed for hay and pasture.

Review of Major Land Ownership

Approximately 40% of this state is public lands. Most of the public land is managed for multiple use, and leases by individual ranchers is common. Conservation planning on private land may include a public component, however the opportunity for private individuals to construct permanent conservation practices on public lands is limited.

Expected TSP Workflow

- The State Resource Conservationist (SRC) will be responsible for reviewing TSP conservation planning for the National Planner Certification.
- Subsequent conservation plans will be reviewed by the District Conservationist (DC) at the local USDA Service Center.
- The SRC will conduct plan reviews for TSP planner certification renewals.
- TSPs will work with the local District Conservationist to make sure the proper environmental evaluations (NRCS.CPA.52) are completed.

Additional References or Training

- State Field Office Technical Guide at www.nrcs.usda.gov
- State Training on CNMP Development
Call Mark Ferguson at 859-224-7370 to register for the next course
- State University Nutrient Management Guide:
- <http://www2.ca.uky.edu/agc/pubs/agr/agr1/agr1.pdf>
- <http://www.bae.uky.edu/awqpt/calculators.htm>
- State Statute when engineering license is need for planning conservation practices: – see the EXCEL spreadsheet in the same folder listing all practices need a P.E. license in Kentucky

Non-Discrimination Statement

Non-Discrimination Policy

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To File an Employment Complaint

If you wish to file an employment complaint, you must contact your agency's EEO Counselor within 45 days of the date of the alleged discriminatory act, event, or in the case of a personnel action. Additional information can be found online at http://www.ascr.usda.gov/complaint_filing_file.html

To File a Program Complaint

If you wish to file a Civil Rights program complaint of discrimination, complete the USDA Program Discrimination Complaint Form, found online at http://www.ascr.usda.gov/complaint_filing_cust.html, or at any USDA office, or call (866) 632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter to us by mail at U.S. Department of Agriculture, Director, Office of Adjudication, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9419, by fax at (202) 690-7442, or email at program.intake@usda.gov

Persons with Disabilities

Individuals who are deaf, hard of hearing or have speech disabilities and you wish to file either an EEO or program complaint please contact USDA through the Federal Relay Service at (800) 877-8339 or (800) 845-6136 (in Spanish).

Persons with disabilities, who wish to file a program complaint, please see information above on how to contact us by mail or by email. If you require alternative means of communication for program information (e.g., Braille, large print, audiotope, etc.), please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

Supplemental Nutrition Assistance Program

For any other information dealing with Supplemental Nutrition Assistance Program (SNAP) issues, persons should either contact the USDA SNAP Hotline Number at (800) 221-5689, which is also in Spanish, or call the State Information/Hotline Numbers.

All Other Inquires

For any other information not pertaining to civil rights, please refer to the listing of the USDA Agencies and Offices.

State: KENTUCKY

Practice #	Practice Name	Federal/State Law Citation	Requirements	Comments
309	Agrichemical Handling Facility	State Professional Engineer's License		
310	Bedding	State Professional Engineer's License		
311	Alley Cropping			
313	Waste Storage Facility	State Professional Engineer's License		
314	Brush Management			
315	Herbaceous Weed Control			
316	Animal Mortality Facility	State Professional Engineer's License		
317	Composting Facility	State Professional Engineer's License		
320	Irrigation Canal or Lateral	State Professional Engineer's License		
322	Channel Bank Vegetation			
324	Deep Tillage			
326	Clearing and Snagging	State Professional Engineer's License		
327	Conservation Cover			
328	Conservation Crop Rotation			
329	Residue and Tillage Management, No-Till/Strip Till/Direct Seed			
330	Contour Farming			
331	Contour Orchard and Other Perennial Crops			
332	Contour Buffer Strips			
338	Prescribed Burning			
340	Cover Crop			
342	Critical Area Planting			
344	Residue Management, Seasonal			
345	Residue and Tillage Management, Mulch Till			
346	Residue and Tillage Management, Ridge Till			
348	Dam, Diversion	State Professional Engineer's License		
350	Sediment Basin	State Professional Engineer's License		
351	Well Decommissioning	State Professional Engineer's License		
353	Monitoring Well	State Professional Engineer's License		
355	Well Water Testing	State Professional Engineer's License		
356	Dike	State Professional Engineer's License		
359	Waste Treatment Lagoon	State Professional Engineer's License		
360	Closure of Waste Impoundment			
362	Diversion	State Professional Engineer's License		
366	Anaerobic Digester	State Professional Engineer's License		
367	Waste Facility Cover	State Professional Engineer's License		
370	Atmospheric Resource Quality Management			
371	Air Filtration and Scrubbing	State Professional Engineer's License		
372	Combustion System Improvement	State Professional Engineer's License		

373	Dust Control on Unpaved Roads and Surfaces	State Professional Engineer's License		
378	Pond	State Professional Engineer's License		
379	Multi-Story Cropping			
380	Windbreak/Shelterbelt Establishment			
381	Silvopasture Establishment			
382	Fence			
383	Fuel Break			
384	Forest Slash Treatment			
386	Field Border			
388	Irrigation Field Ditch	State Professional Engineer's License		
390	Riparian Herbaceous Cover			
391	Riparian Forest Buffer			
393	Filter Strip			
394	Firebreak			
395	Stream Habitat Improvement and Management			
396	Fish Passage			
397	Aquaculture Ponds	State Professional Engineer's License		
398	Fish Raceway or Tank	State Professional Engineer's License		
399	Fishpond Management			
402	Dam	State Professional Engineer's License		
409	Prescribed Forestry			
410	Grade Stabilization Structure	State Professional Engineer's License		
412	Grassed Waterway	State Professional Engineer's License		
422	Hedgerow Planting			
423	Hillside Ditch	State Professional Engineer's License		
428	Irrigation Ditch Lining	State Professional Engineer's License		
430	Irrigation Pipeline	State Professional Engineer's License		
431	Above Ground, Multi-Outlet Pipeline	State Professional Engineer's License		
432	Dry Hydrant	State Professional Engineer's License		
436	Irrigation Reservoir	State Professional Engineer's License		
441	Irrigation System, Microirrigation	State Professional Engineer's License		
442	Irrigation System, Sprinkler	State Professional Engineer's License		
443	Irrigation System, Surface and Subsurface	State Professional Engineer's License		
447	Irrigation System, Tailwater Recovery	State Professional Engineer's License		
449	Irrigation Water Management	State Professional Engineer's License		
450	Anionic Polyacrylamide (PAM) Application	State Professional Engineer's License		
453	Land Reclamation, Landslide Treatment	State Professional Engineer's License		
455	Land Reclamation, Toxic Discharge Control	State Professional Engineer's License		
457	Mine Shaft and Adit Closing	State Professional Engineer's License		
460	Land Clearing	State Professional Engineer's License		
462	Precision Land Forming	State Professional Engineer's License		
464	Irrigation Land Leveling	State Professional Engineer's License		
466	Land Smoothing	State Professional Engineer's License		
468	Lined Waterway or Outlet	State Professional Engineer's License		

472	Access Control			
482	Mole Drain	State Professional Engineer's License		
484	Mulching			
490	Tree/Shrub Site Preparation			
500	Obstruction Removal	State Professional Engineer's License		
511	Forage Harvest Management			
512	Forage and Biomass Planting			
516	Pipeline	State Professional Engineer's License		
521A	Pond Sealing or Lining, Flexible Membrane	State Professional Engineer's License		
521B	Pond Sealing or Lining, Soil Dispersant	State Professional Engineer's License		
521C	Pond Sealing or Lining, Bentonite Sealant	State Professional Engineer's License		
521D	Pond Sealing or Lining, Compacted Clay Treatment	State Professional Engineer's License		
527	Sinkhole and Sinkhole Area Treatment	State Professional Engineer's License		
528	Prescribed Grazing	State Professional Engineer's License		
533	Pumping Plant	State Professional Engineer's License		
543	Land Reconstruction, Abandoned Mined Land	State Professional Engineer's License		
544	Land Reconstruction, Currently Mined Land	State Professional Engineer's License		
548	Grazing Land Mechanical Treatment			
550	Range Planting			
554	Drainage Water Management	State Professional Engineer's License		
555	Rock Barrier	State Professional Engineer's License		
557	Row Arrangement			
558	Roof Runoff Structure	State Professional Engineer's License		
560	Access Road	State Professional Engineer's License		
561	Heavy Use Area Protection	State Professional Engineer's License		
562	Recreation Area Improvement	State Professional Engineer's License		
566	Recreation Land Grading and Shaping	State Professional Engineer's License		
568	Trails and Walkways	State Professional Engineer's License		
570	Runoff Management System	State Professional Engineer's License		
572	Spoil Spreading	State Professional Engineer's License		
574	Spring Development	State Professional Engineer's License		
575	Animal Trails and Walkways	State Professional Engineer's License		
578	Stream Crossing	State Professional Engineer's License		
580	Streambank and Shoreline Protection	State Professional Engineer's License		
582	Open Channel	State Professional Engineer's License		
584	Channel Stabilization	State Professional Engineer's License		
585	Stripcropping			
587	Structure for Water Control	State Professional Engineer's License		
588	Cross Wind Ridges			
589C	Cross Wind Trap Strips			
590	Nutrient Management			
591	Amendments for the Treatment of Agricultural Waste	State Professional Engineer's License		

592	Feed Management			
595	Integrated Pest Management			
600	Terrace	State Professional Engineer's License		
601	Vegetative Barrier			
603	Herbaceous Wind Barriers			
606	Subsurface Drain	State Professional Engineer's License		
607	Surface Drain, Field Ditch	State Professional Engineer's License		
608	Surface Drain, Main or Lateral	State Professional Engineer's License		
609	Surface Roughening			
610	Salinity and Sodic Soil Management			
612	Tree/Shrub Establishment			
614	Watering Facility	State Professional Engineer's License		
620	Underground Outlet	State Professional Engineer's License		
629	Waste Treatment (bio-filter)	State Professional Engineer's License		
630	Vertical Drain	State Professional Engineer's License		
632	Solid/Liquid Waste Separation Facility	State Professional Engineer's License		
633	Waste Utilization	State Professional Engineer's License		
634	Waste Transfer	State Professional Engineer's License		
635	Vegetated Treatment Area	State Professional Engineer's License		
636	Water Harvesting Catchment	State Professional Engineer's License		
638	Water and Sediment Control Basin	State Professional Engineer's License		
640	Waterspreading	State Professional Engineer's License		
642	Water Well	State Professional Engineer's License		
643	Restoration and Management of Rare and Declining Habitats			
644	Wetland Wildlife Habitat Management			
645	Upland Wildlife Habitat Management			
646	Shallow Water Development and Management	State Professional Engineer's License		
647	Early Successional Habitat Development/Management			
650	Windbreak/Shelterbelt Renovation			
654	Road/Trail/Landing Closure and Treatment	State Professional Engineer's License		
655	Forest Trails and Landings	State Professional Engineer's License		
656	Constructed Wetland	State Professional Engineer's License		
657	Wetland Restoration	State Professional Engineer's License		
658	Wetland Creation	State Professional Engineer's License		
659	Wetland Enhancement	State Professional Engineer's License		
660	Tree/Shrub Pruning			
666	Forest Stand Improvement			

Conservation Activity Plans

102	Comprehensive Nutrient Management Plan - Written			
106	Forest Management Plan - Written			
110	Grazing Management Plan - Written			

114	Integrated Pest Management Plan - Written			
118	Irrigation Water Management Plan - Written	State Professional Engineer's License		
126	Comprehensive Air Quality Management Plan - Written			
128	Agriculture Energy Management Plan-Written	State Professional Engineer's License		
130	Drainage Water Management Plan - Written	State Professional Engineer's License		
134	Conservation Plan Supporting Transition from Irrigation to Dry-land Plan - Written			
138	Conservation Plan Supporting Organic Transition - Written			
142	Fish and Wildlife Habitat Plan - Written			
146	Pollinator Habitat Plan - Written			

Kentucky N & P Index calculator tool user's manual

Kentucky Nitrogen Index 4.5 | Basic Information

Navigation

* To save data/move forward or backward click Navigation Tab.

Name MSU F-40

Location Morehead

Date 02/04/2013 Today

Scenario Corn silage

Price: \$ / lbs N 0.52

Specific Treatments

Dry Manure Applied Past 2 Years

Liquid Manure Applied Past 2 Years

Fertilizer Applied Current Year

Irrigation Applied Current Year

Soil Sustainability

Fill out the info boxes on the left and select the tabs on the right if they apply dry or liquid manure and fertilizer. These tabs will bring up the appropriate info boxes later.

When finished – click on the “Navigation” tab and select “Save”.

Soils information box

Kentucky Nitrogen Index 4.5 | Soil Layer / Soil Info...

Navigation

Soil Layer: ppm

#1 #2 #3

*Top soil layer

Soil Depth 1 feet Soil PH 6.8

Organic Matter 3% Slope 0%

N-O3N 22 ppm SOM N Rate 40

NH4-N 9 ppm Default Custom

Bulk Density 1.3 g/cm3

Soil Profile: 0 - 1.0 feet

The three different soil layers are created for California where the regulators require annual soil Nitrogen tests before crop planting and after crop harvest to check on Nitrogen leaching on flood irrigated crops. In Kentucky we just need to fill out the layer #1 box.

If there is no soil organic material test available enter the OM content written in the general soils description for that map unit.

Most of the time we would have no Nitrogen soil test, unless for PSNT, but as a minimum you can always enter the above parameters for Nitrate and Ammonium. The bulk density could be found in the soils description also. The SOM – soil Nitrogen mineralization rate is pre-set for Kentucky at 40.

When finished entering the data click on the “Navigation” tab and select “Save”.

Dry manure information input screen

The screenshot displays the 'Dry Manure' input screen for the 'Kentucky Nitrogen Index 4.5'. The interface is divided into two main sections for entering data for two different years (1 and 2). Each section includes a dropdown for manure type, a unit selector (lbs N), and several input fields for nutrient and moisture values. The application method is selected via radio buttons, and the release percentages are entered in two boxes. The AVC (Ammonia Volatilization Coefficient) is also specified. A 'Manure Entry Converter' button is located at the bottom of the screen.

Year	Manure Type	Unit	Wet Weight (ton/a)	% Moisture	NH4-N DB (lbs)	WEP	Total N DB (lbs)	P2O5 DB (lbs)	K2O DB (lbs)	% Release (1st/2nd Year)	Application Method	AVC	Season	Temp
1	Beef Manure (KY)	lbs N	13	67	6	0.65	18	26	0	40 15	Incorporated	2	Fall	> 50°
2	Beef-Colorado	lbs N		32.0	4.0	0.65	34.0	36.0	60.0	40.0 15.0	Surface Applied	12.0	Fall	> 50°

Enter the dry manure applications for both year. Use the manure analysis records for the nutrient values. Check if the manure is surface applied or incorporated.

Do not change the AVC Ammonia Volatilization Coefficient value, it was set for Kentucky at 2.0.

When finished entering the data click on the “Navigation” tab and select “Save”.

Liquid manure application input screen.

Kentucky Nitrogen Index 4.5 | Liquid Manure

Navigation

Current Year (1/2) Current Year (3/4) Previous Year (1/2)

Applied Application

IN-Swine Lagoon Gallons

NH4-N 3 lbs N/1k gal Amount 15000 gal/ac

Total N 4 lbs N/1k gal WEP 0.4

P2O5 2 lbs P2O5/1k gal Fall > 50°

% Release (1st/2nd Year) 0.35 10.0

Surface Applied Incorporated

AVC 12.0 Default Custom

Applied Application

CA-Average in/acre

NH4-N 230.0 ppm Amount in/ac

Total N 330.0 ppm WEP 0.65

P2O5 500.0 ppm Fall > 50°

% Release (1st/2nd Year) 30.0 15.0

Surface Applied Incorporated

AVC 12.0 Default Custom

We used Indiana’s default nutrient values for liquid manure, but you need to enter the actual manure analysis data. Check if it was surface applied or incorporated.

When finished entering the data click on the “Navigation” tab and select “Save”.

WEP = water extractable Phosphorus, means water soluble Phosphorus of the manure.

Fertilizer application input screen.

The screenshot shows a software window titled "Kentucky Nitrogen Index 4.5 | Fertilizer". The window contains a "Navigation" section with an "Application:" label and five tabs labeled "#1", "#2", "#3", "#4", and "#5". The "#1" tab is selected. Below the tabs, there are several input fields and checkboxes:

- "Source of N and Method of Application" dropdown menu set to "UAN Surface".
- "Applied Application" checkbox, which is checked.
- "Rain / Irrigation during Application" dropdown menu set to "1/2+ inch of rain/irrigation within 2 days".
- "Amount" input field set to "150" lbs N/ac.
- "Fall" dropdown menu.
- "Controlled Release Fertilizer" checkbox, which is unchecked.
- "Nitrification Inhibitor" checkbox, which is unchecked.
- "Split Fertilizer" checkbox, which is unchecked.
- "AVC" input field set to "3".
- "Default" radio button, which is unselected.
- "Custom" radio button, which is selected.

Enter all fertilizer applications including side-dress or top dress Nitrogen applications.

Check the appropriate boxes if they use controlled release fertilizer or Nitrification inhibitors.

When finished entering the data click on the “Navigation” tab and select “Save”.

Crops information input screen.

Kentucky Nitrogen Index 4.5 | Crop

Navigation

Root Depth of Deepest Rooted Crop inches

Crop #1 | Crop #2 | Crop #3

Crop #1

Crop

Corn-Silage

Yield (Wet Weight) Leguminous

Unit	Weight/Unit	% H2O	NUI
<input type="text" value="Ton"/>	<input type="text" value="2000.0"/>	<input type="text" value="70.0"/>	<input type="text" value="7.5"/>

Residue of Previous Crop #1

Crop

Alfalfa-Green Chop

Yield (Wet Weight) Leguminous

C/N Time of Incorporation

< 30

> 30

Unit	Weight/Unit	% H2O	NUI
<input type="text" value="Ton"/>	<input type="text" value="2000.0"/>	<input type="text" value="75.0"/>	<input type="text" value="18"/>

Enter the suggested rooting depth for the deepest rooted crop in the rotation according to the individual field's soil map unit characteristics.

Fill in the yield and residue values.

When finished entering the data click on the "Navigation" tab and select "Save".

Off-Site factors input screen.

Kentucky Nitrogen Index 4.5 | Off-Site Factors

Travel Time to Aquifer
Moderate (5-15 Years)

Position of Aquifer
Medium

Vulnerability of Aquifer
IIB: Potential Drinking Water

Denitrification Coefficient 16.0
 Default
 Custom

K Constant 1.2
 Default
 Custom

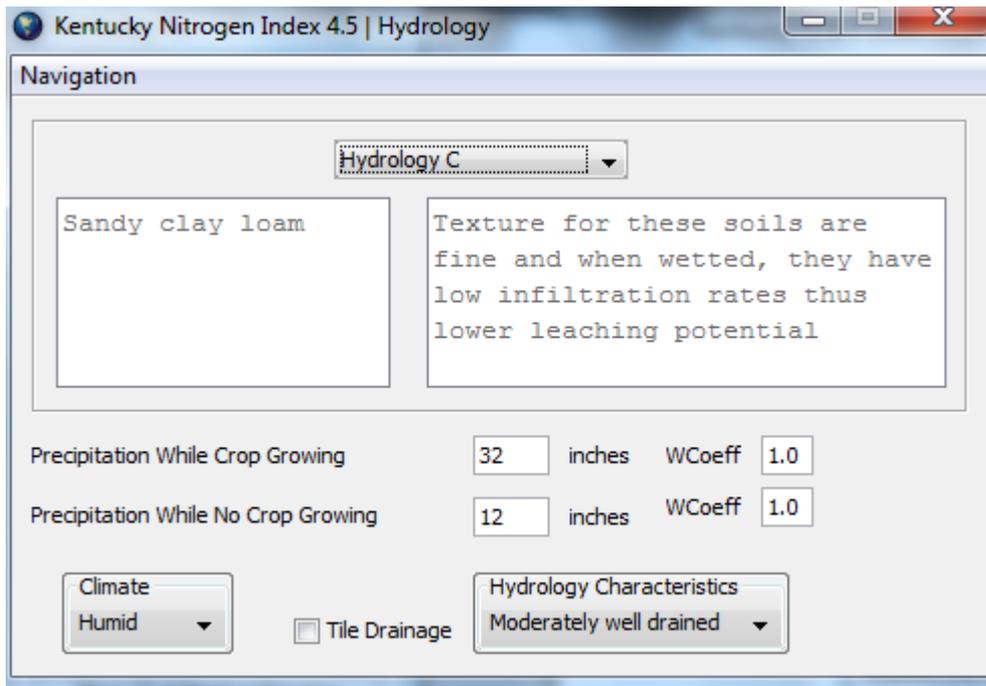
Save

Annual Atmospheric Wet/Dry N Deposition 12 lbs N/acre

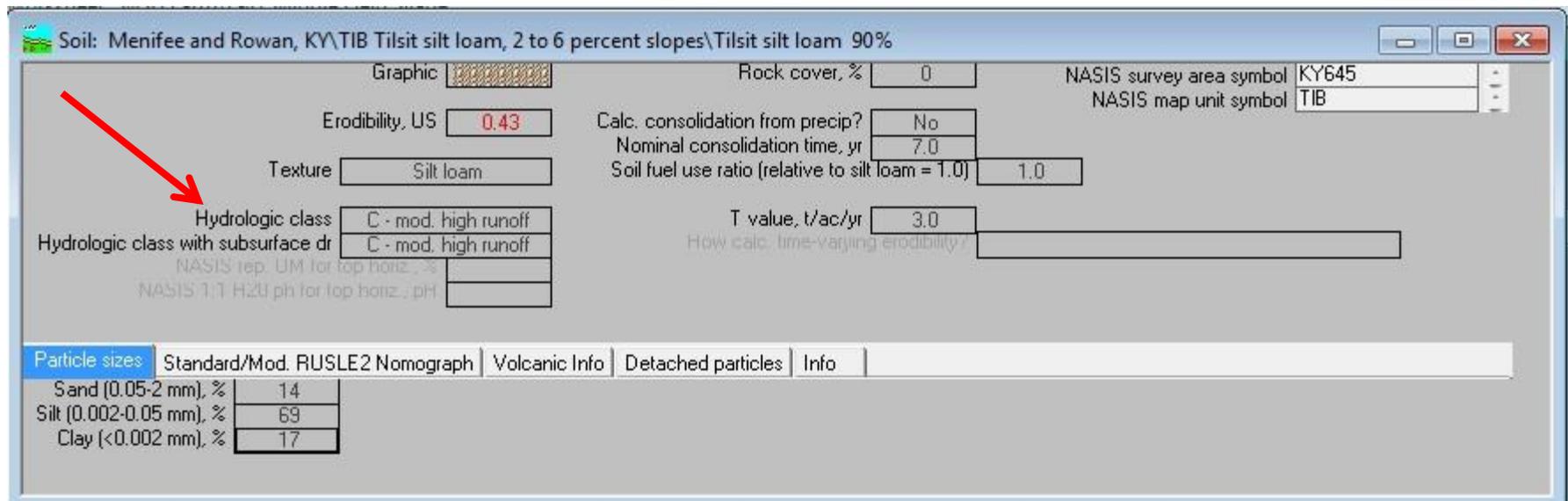
Select the corresponding options for “Travel Time to Aquifer”, “Position of Aquifer” and “Vulnerability of Aquifer” based on the Kentucky Groundwater Sensitivity Regions Map (next slide).

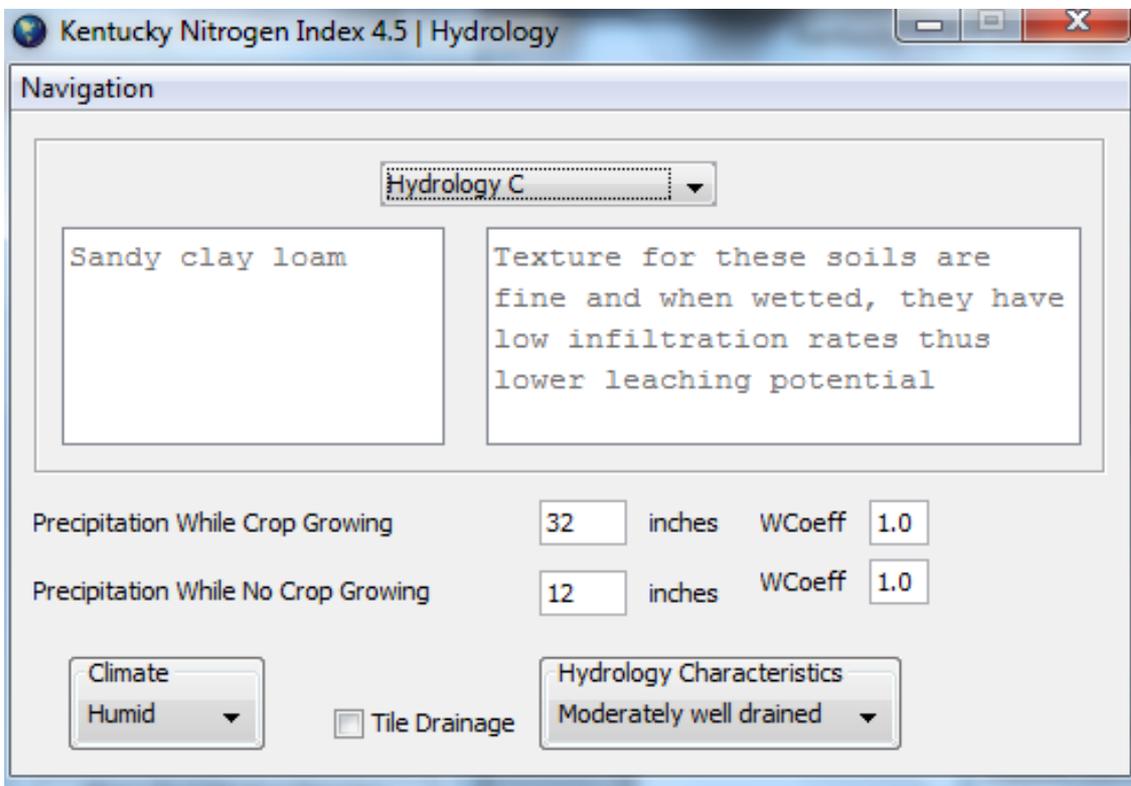
Enter about 12 lbs N/acre Atmospheric N Deposition in Kentucky.

When finished entering the data click on the “Navigation” tab and select “Save”.



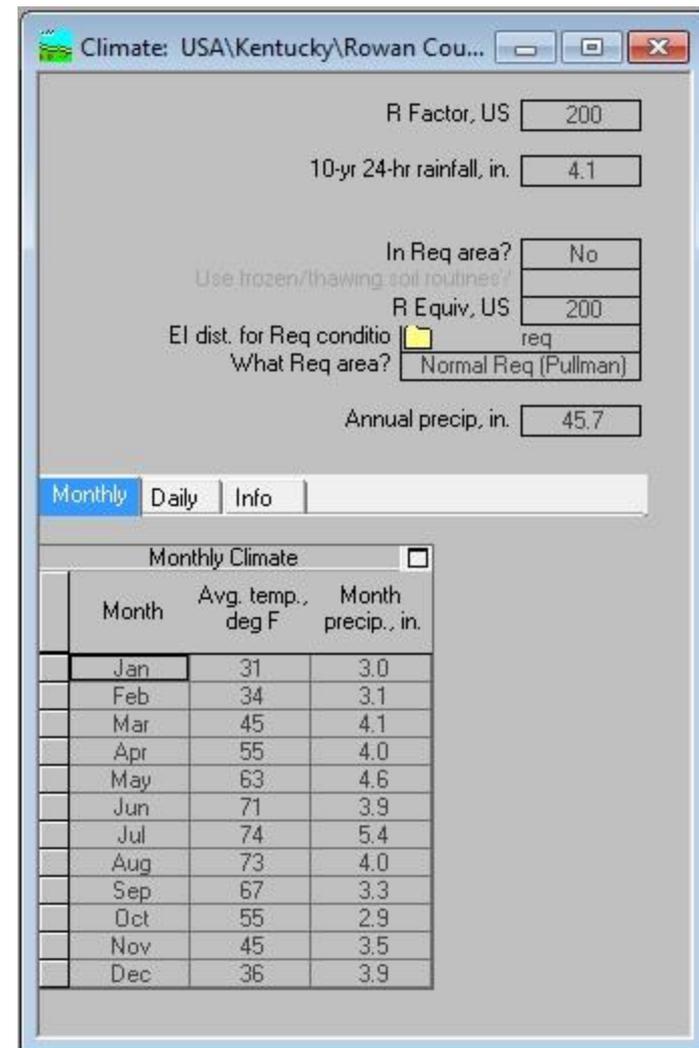
Check the soil map unit's Hydrologic group – found in the the RUSLE2 soil file:





Enter the precipitation data from RUSLE2 climate window for the months while crop is growing and for the months while no crop is grown.

The WC – water infiltration coefficient indicates how many percent of the precipitation will percolate into the soil – in this scenario we selected 75%. (depends on slope, ground cover, compaction, and contour farming)



Kentucky Nitrogen Index 4.5 | Qualitative Factors

Navigation

Vegetative Buffer
20 - 65 feet wide

Nitrogen Application Rate
Yield goal respective to University Rate AND tissue/soil test in season

Proximity of nearest field edge to named stream or lake
Medium (> 200 - 500 feet)

Volatilization Susceptible N Application Method
None applied

Runoff Class (Runoff Class Table)
Medium

Tile Drainage
No Tile Drainage

Rooting Depths and Crop Rotation
2.5 - 3.5 feet wide

Irrigation Erosion
No irrigation OR negligible sediment erosion

Soil Erosion (Wind & Water)
Very Low (< 1 t/ac)

Cultivation
Cultivated

Cover crop and Fertilizer
Cover crops - Split Fertilizer /over karst or no karst

Leaching
Corn-soybean deep soil

Fill in the data for all windows based on the actual crop field's characteristics.

Soil: Menifee and Rowan, KY\TIB Tilsit silt loam, 2 to 6 percent slopes\Tilsit silt loam 90%

Graphic 

Rock cover, % 0

NASIS survey area symbol KY645

NASIS map unit symbol TIB

Erodibility, US 0.43

Calc. consolidation from precip? No

Nominal consolidation time, yr 7.0

Soil fuel use ratio (relative to silt loam = 1.0) 1.0

Texture Silt loam

T value, t/ac/yr 3.0

How calc. time-varying erodibility?

Hydrologic class C - mod. high runoff

Hydrologic class with subsurface dr C - mod. high runoff

NASIS rep. UM for top horiz. %

NASIS 1:1 H2O pH for top horiz. pH

Particle sizes Standard/Mod. RUSLE2 Nomograph Volcanic Info Detached particles Info

Sand (0.05-2 mm), %	14
Silt (0.002-0.05 mm), %	69
Clay (<0.002 mm), %	17

Kentucky Nitrogen Index 4.5 | Phosphorus Index

Navigation

Phosphorus Index

Soil Test Phosphorus	<input type="text" value="35"/>	Mehlich-3 STP (lbs P/ac)
Fertilizer Phosphorus	<input type="text" value="0"/>	lbs P2O5/ac
Average annual erosion rate	<input type="text" value="0.92"/>	tons/ac/yr
Curve number	<input type="text" value="76"/>	
Sediment Delivery Ratio	Receiving slope length <input type="text" value="30 feet"/>	
Distance to receiving water body	Distance to receiving water body <input type="text" value="0-30 feet"/>	
Slope	Slope <input type="text" value="0 - 2%"/>	
Best management practices	Best management practices <input type="text" value="Buffer/Filter strip 20-75 feet wide"/>	
County	Kentucky Counties <input type="text" value="Rowan"/>	

Application factors

Fertilizer application	<input type="text" value="Banded or injected >2 inches"/>
Dry manure 1 application	<input type="text" value="Surface applied, not incorporated Mar, Apr, Nov"/>
Dry manure 2 application	<input type="text" value="Banded or injected >2 inches"/>
Wet manure 1 application	<input type="text" value="Banded or injected >2 inches"/>
Wet manure 2 application	<input type="text" value="Banded or injected >2 inches"/>

Enter the soil test Phosphorus, the RUSLE2 soil erosion prediction rate and the runoff curve number (CN) from RUSLE2. (see the RUSLE2 slides to learn where to find CN in RUSLE2.

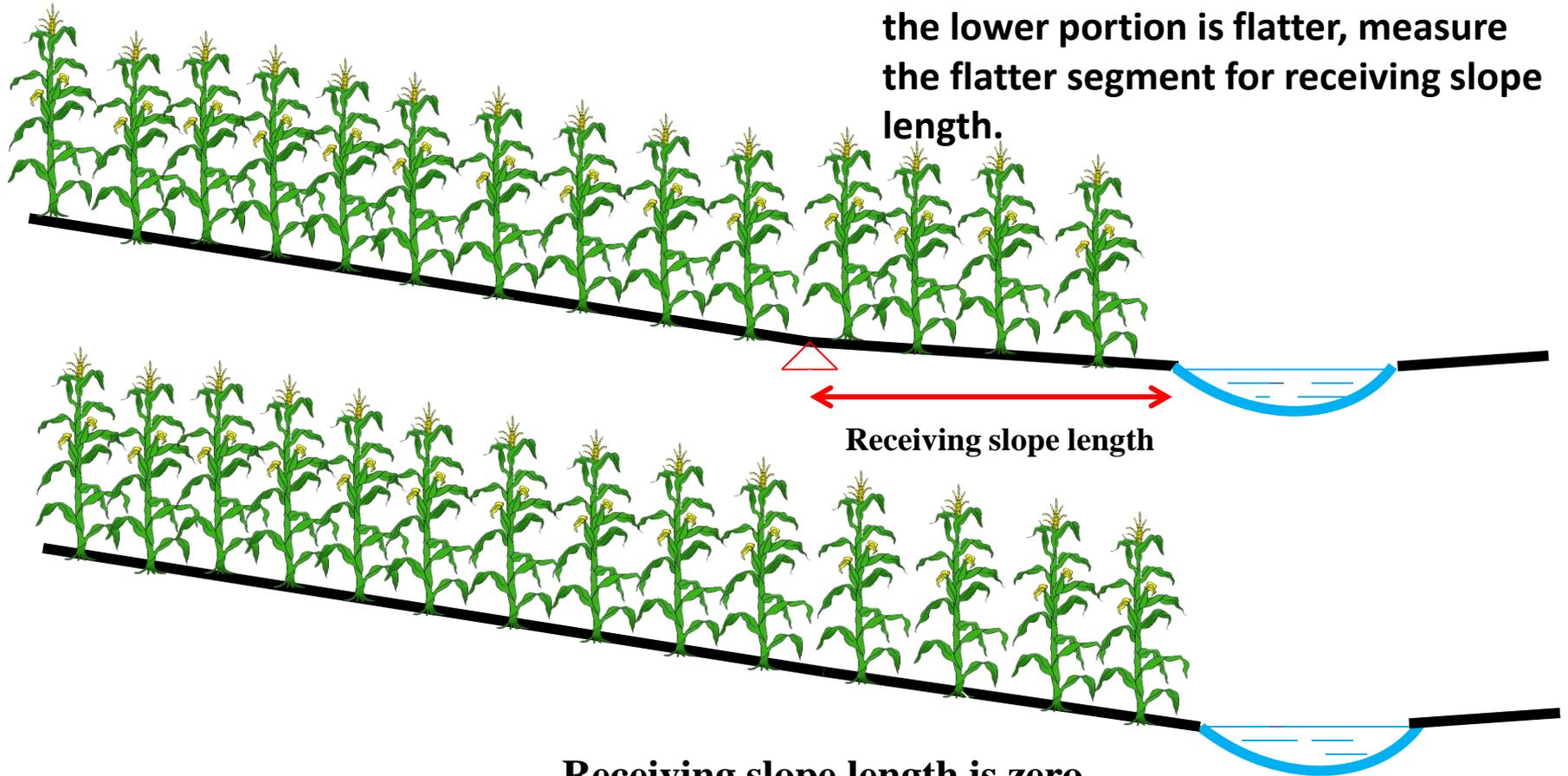
The next slides will explain the determination of the receiving slope length.

Check the appropriate fertilizer and manure application methods by clicking on the down arrows and selecting the practices.

When finished entering the data click on the “Navigation” tab and select “Save”.

Receiving Slope Length for Sediment Delivery Ratio (SDR)

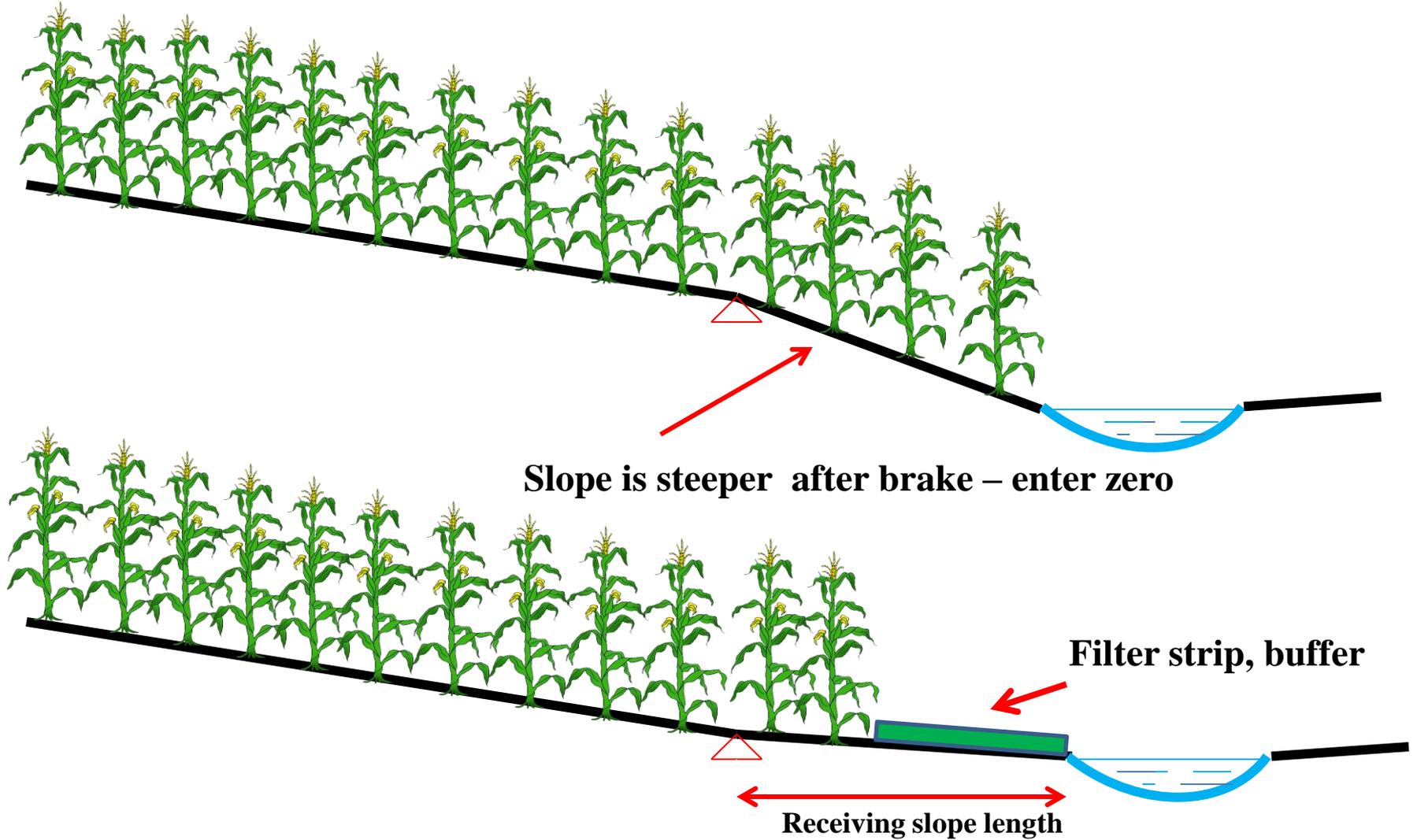
If there is a brake in the slope where the lower portion is flatter, measure the flatter segment for receiving slope length.



Receiving slope length

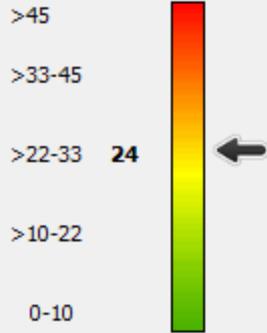
Receiving slope length is zero
(no brake in slope)

Receiving Slope Length for Sediment Delivery Ratio (SDR)

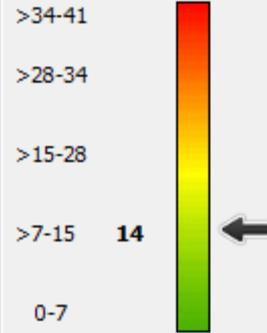


Qualitative Nitrogen Results

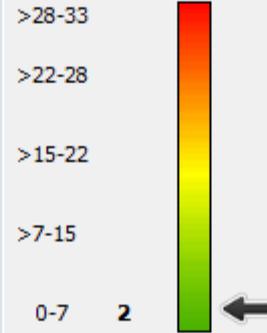
Nitrate Leaching



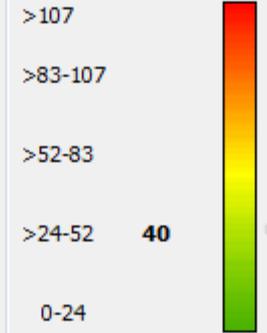
Surface Transport



Atmospheric



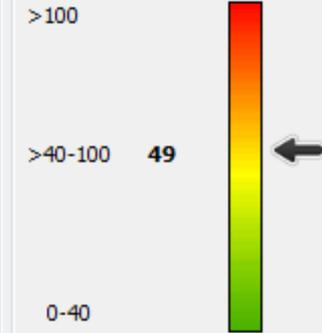
Total



Qualitative Phosphorus Results

Phosphorus Index

Kentucky Beta Version



N2O Index

Interpretation of Rankings

Interpretation of Phosphorus Rankings

Definitions of Outputs

Economic Assessment

Ranking Matrix

Save File

Generate Report

Quantitative Nitrogen Results

Total N System In	536 lbs N / a y	Leaching Index (LI)	1.6 inches
Ammonia Volatilization	10 lbs N / a y	Total Nitrogen Leached	57 lbs N / a y
Denitrification	44 lbs N / a y	Residual Nitrate	180 lbs N / a y
Above Ground Uptake	246 lbs N / a y	System Use Efficiency	46 %
Ratio N Applied to N Removed by Crop		0.98	

Quantitative Nitrogen (N) Input

N Fertilizer	140 lbs N / a y
NH4 Manure	67 lbs N / a y
Total N Manure	234 lbs N / a y (current year)
N Mineralized Manure	32 lbs N/ac (current & last year)

Quantitative Phosphorus Results

Fertilizer Phosphorus	0 lbs P2O5 / a y
Soil Test Phosphorus	73 lbs P / a y
Manure Phosphorus	215 lbs P2O5 / a y

The Phosphorus Index reading is 46 – means Phosphorus application rates cannot exceed the crop removal rate for the given crop year. Since the operation needs to apply their manure, we need to go back and change the tillage or crop rotation to bring the P Index below 40.

New Kentucky Phosphorus Index Risk Categories and Limitations

Range	Category	Interpretation
0-40	Low	<p>Phosphorus can be applied at rates greater than crop requirement not to exceed the nitrogen requirement for the succeeding crop.</p> <p><i>If the soil total Phosphorus level is 800 or higher no P application of any kind allowed.</i></p>
40-100	Moderate	<p>Phosphorus can be applied not to exceed the crop requirement rate.</p> <p><i>If the soil total Phosphorus level is 600 or higher no P application of any kind allowed.</i></p>
>100	High	<p>Phosphorus can be applied not to exceed the crop removal rate if the following requirements are met:</p> <ul style="list-style-type: none"> • A soil phosphorus drawdown strategy has been implemented, and • A site assessment for nutrients and soil loss has been conducted to determine if mitigation practices are required to protect water quality. • <i>If the soil total Phosphorus level is 400 or higher no P application of any kind allowed.</i> • Any deviation from these high risk requirements must have the approval of the Chief of NRCS.

Navigation

Phosphorus Index

Soil Test Phosphorus	<input type="text" value="35"/>	Mehlich-3 STP (lbs P/ac)
Fertilizer Phosphorus	<input type="text" value="0"/>	lbs P2O5/ac
Average annual erosion rate	<input type="text" value="2.6"/>	tons/ac/yr
Curve number	<input type="text" value="81"/>	
Sediment Delivery Ratio	Receiving slope length <input type="text" value="30 feet"/>	
Distance to receiving water body	Distance to receiving water body <input type="text" value="0-30 feet"/>	
Slope	Slope <input type="text" value="0 - 2%"/>	
Best management practices	Best management practices <input type="text" value="Buffer/Filter strip 20-75 feet wide"/>	
County	Kentucky Counties <input type="text" value="Rowan"/>	

Application factors

- Fertilizer application
- Dry manure 1 application
- Dry manure 2 application
- Wet manure 1 application
- Wet manure 2 application

The farm is utilizing minimum tillage – called conservation disk – but going for no-till corn silage will greatly reduce the annual soil loss and the runoff curve number.

When finished entering the data click on the “Navigation” tab and select “Save”.

Kentucky Nitrogen Index 4.5 | Phosphorus Index

Phosphorus Index

Soil Test Phosphorus	<input type="text" value="73"/>	Mehlich-3 STP (lbs P/ac)
Fertilizer Phosphorus	<input type="text" value="0"/>	lbs P2O5/ac
Average Annual Erosion Rate	<input type="text" value="1.2"/>	tons/ac/yr
Curve Number	<input type="text" value="77"/>	
Sediment Delivery Ratio	Receiving Slope Length <input type="text" value="30 feet"/>	
Best Management Practices	Best Management Practice <input type="text" value="Buffer/Filter strip 20-75 feet wide"/>	
County	Kentucky Counties <input type="text" value="Rowan"/>	

Application Factors

Fertilizer Application	<input type="text" value="Banded or injected > 2 inches"/>
Dry Manure 1 Application	<input type="text" value="Surface Applied, incorporated < 30 days"/>
Dry Manure 2 Application	<input type="text" value="Banded or injected > 2 inches"/>
Wet Manure 1 Application	<input type="text" value="Banded or injected > 2 inches"/>
Wet Manure 2 Application	<input type="text" value="Banded or injected > 2 inches"/>

The planned no-till practice reduced the annual soil loss rate from 2.6 T/acre/year to 1.2 T/acre/year and the runoff curve number (CN) from 81 to 77.

When finished entering the data click on the “Navigation” tab and select “Save”.



The P-Index rating is 32 with the no-till practice and the farm can continue applying manure based on the crop's Nitrogen need. When you finished with the planning, click on the "Save File" tab to save the Nitrogen & Phosphorus Index scenario.

Review of State Soil Health Concerns

Soil health in Kentucky has been severely degraded on crop and pasture fields due to soil organic matter depletion from a long history of tillage and over grazing as well as a climate conducive to organic matter depletion.

To improve soil health on crop fields, special emphasis should be given to growing large biomass cash crops and/or cover crop mixtures where heavy biomass is left on the soil surface. Whenever possible all cash crops should be no-tilled into heavy biomass crop residues and/or cover crop mixture residues.

Care should be taken to implement rotational grazing and/or mob grazing in pasture fields to increase organic matter content and rebuild a functioning soil water cycle.

Certificate of Completion

After viewing the State Specific Training module, please print and sign the completion certificate on the following slide.

The certificate is your acknowledgement that based on the information provided in this module, you have the proper knowledge, skills and ability to conduct planning in this state.

Send the signed certificate to the State TSP Coordinator. Copy the below link to your browser for a list of State TSP Coordinators.

<https://techreg.sc.egov.usda.gov/RptStateContact4Admin.aspx>

STATE SPECIFIC TRAINING MODULE COMPLETION CERTIFICATE

I, _____, hereby verify I have viewed and understand the
TSP Name
content of the Kentucky State Specific Training Module and affirm I have the
knowledge, skills and ability to conduct conservation planning services in that
state.

TSP signature

Date