



# The Rapid Phosphorus Index

Choose only one tool. Put the field identifier in the top row. For each field, check the appropriate box if a criteria is met. If any one of the criteria are met, then the full MN P Index should be run on the field to calculate a more reliable estimate of P loss risk.

## High sensitivity screening tool

The total P Index may be greater than 2 if a field meets any of these criteria.

		Field i.d.:						
----- Screening criteria -----	Any amount of manure or fertilizer <i>unincorporated</i>							
	More than 100 lbs P <sub>2</sub> O <sub>5</sub> /ac/yr manure and/or fertilizer <i>incorporated</i>							
	Soil test P is >100ppm (Olsen) and soil loss is >3 t/ac/yr							
	Soil test P is >100ppm (Olsen) and drainage is poor							
	Erosion is >8 t/ac/yr							
	Distance to water is <100 ft and erosion is >5 t/ac/yr							
	Distance to water is <10 ft and erosion is >3 t/ac/yr							

## Moderate sensitivity screening tool

The total P Index may be greater than 4 if a field meets any of these criteria, or any two of the criteria in the high sensitivity tool.

		Field i.d.:						
----- Screening criteria -----	More than 100 lbs P <sub>2</sub> O <sub>5</sub> /ac/yr manure and/or fertilizer <i>unincorporated</i>							
	More than 200 lbs P <sub>2</sub> O <sub>5</sub> /ac/yr manure and/or fertilizer <i>incorporated</i>							
	Soil test P is >100ppm (Olsen) and soil loss is >3 t/ac/yr							
	Erosion is >10 t/ac/yr							
	Distance to water is <100 ft and erosion is >6 t/ac/yr							
	Distance to water is <10 ft and erosion is >4 t/ac/yr							

## Low sensitivity screening tool

The total P Index may be greater than 6 if a field meets any of these criteria, or any two of the criteria in the moderate sensitivity tool.

		Field i.d.:						
-- Screening criteria --	More than 200 lbs P <sub>2</sub> O <sub>5</sub> /ac/yr manure and/or fertilizer <i>unincorporated</i>							
	More than 200 lbs P <sub>2</sub> O <sub>5</sub> /ac/yr manure and/or fertilizer <i>incorporated</i> AND erosion is more than 4 t/ac/yr							
	Erosion is >10 t/ac/yr							
	Distance to water is <10 ft and erosion is >6 t/ac/yr							

## The Rapid Phosphorus Index: Instructions

The Minnesota Phosphorus Index (MN P Index) is a tool for estimating the risk of P loss from an agricultural field. When many fields need to be analyzed, the Rapid Phosphorus Index (RPI) can be used as a screening tool to eliminate the lowest risk sites or highlight the highest risk sites where the MN P Index will be applied.

The RPI is a set of indicators and thresholds based on the MN P Index. It identifies sites with high risk of P loss if risk is attributable to major risk factors, but it will not assess minor risk factors nor interactions among multiple factors.

The inputs needed for the RPI are manure and fertilizer application rates and method, soil test P, erosion rate, distance to water, and whether the soil is poorly drained. Use the table below to collect these inputs.

The RPI is three separate screening tools of varying sensitivity. Choose the one appropriate for your goals. The high sensitivity version identifies sites likely to have a MN P Index value greater than 2; the medium sensitivity version identifies sites likely to be greater than 4; and the low sensitivity version only identifies sites likely to have a MN P Index value greater than 6. The RPI will occasionally mis-identify a field as either higher or lower risk. Consider which type of error you can tolerate. For example, if it is important not to miss any high risk sites, choose a higher sensitivity tool. If it is important to minimize the number of fields analyzed with the MN P Index, choose a lower sensitivity tool.

**Data Collection Table:** Circle one option in each cell and enter an erosion estimate.

Field i.d.:								
<b>Manure* and fertilizer</b> (non-injected) lbs P <sub>2</sub> O <sub>5</sub> /ac/yr	0	0	0	0	0	0	0	0
	1-100	1-100	1-100	1-100	1-100	1-100	1-100	1-100
	101-200	101-200	101-200	101-200	101-200	101-200	101-200	101-200
	>200	>200	>200	>200	>200	>200	>200	>200
Unincorporated or incorporated?	Uninc. Inc.	Uninc. Inc.	Uninc. Inc.	Uninc. Inc.	Uninc. Inc.	Uninc. Inc.	Uninc. Inc.	Uninc. Inc.
<b>Erosion</b> t/ac/yr								
<b>Soil test P</b> ppm Olsen	<100	<100	<100	<100	<100	<100	<100	<100
	>100	>100	>100	>100	>100	>100	>100	>100
100 ppm Olsen = 140 ppm Bray or Mehlich								
<b>Distance to water</b>	<10 ft	<10 ft	<10 ft	<10 ft	<10 ft	<10 ft	<10 ft	<10 ft
	<100 ft	<100 ft	<100 ft	<100 ft	<100 ft	<100 ft	<100 ft	<100 ft
	>100 ft.	>100 ft.	>100 ft.	>100 ft.	>100 ft.	>100 ft.	>100 ft.	>100 ft.
<b>Internal drainage</b>	Good	Good	Good	Good	Good	Good	Good	Good
	Slow	Slow	Slow	Slow	Slow	Slow	Slow	Slow
Good = Artificially drained or naturally drained      Slow = Soil hydrologic group C or D, or >27% clay, and without artificial drainage								

**\*Approximate manure application rates equivalent to 100 – 200 lbs P<sub>2</sub>O<sub>5</sub>/ac**

	Solid manure (tons/ac)	Liquid slurry (1000 gals/ac)	Liquid anaerobic lagoon (1000 gals/ac)	Pasture (animal units/ac)
Beef	25 – 50	5.9 – 11.8	34.5 – 69.0	3.2 – 6.4
Dairy	33 – 67	6.7 – 13.3	37.0 – 74.1	3.4 – 6.7
Turkey	2 – 4	2.6 – 5.1		
Poultry	2 – 4	2.3 – 4.7	27.8 – 55.6	
Swine	13 – 25	2.9 – 5.7	45.5 – 90.9	
Sheep	10 – 20			3.3 – 6.6
Horse	25 – 50			6.0 – 12.0