

Glossary

4R Nutrient Stewardship:

Right Source: The right source matches fertilizer type to crop needs.
E.g., Liquid or granular; synthetic or organic (manure).

Right Rate: The right rate matches the amount of fertilizer type the crop needs.
E.g., Using soil tests to determine how much is needed by growing crop.

Right Time: The right timing makes nutrients available when crops need them.
E.g., Apply at the time of planting or as it is growing.

Right Place: The right place keeps nutrients where crops can use them.
E.g., Getting nutrients below the surface.

Conventional tillage: A tillage system using cultivation as the major means of seedbed preparation and weed control. Typically includes a sequence of soil tillage, such as plowing and harrowing, to produce a fine seedbed, and also the removal of most of the plant residue from the previous crop. (Source: The Organisation for Economic Co-operation and Development)

Cover crops: Cover crops are planted after the primary crop is harvested in the fall. They can be planted to hold soil and add organic matter until first frost in winter, or to overwinter and be removed or plowed under in the spring. Common cover crops are oats, winter wheat, turnips, radishes, mustard and other grasses, legumes or small grains.

Cover crops are used to:

- 1) Increase the organic matter in the soil which helps to increase the water-holding capacity of a field,
- 2) return nutrients to the soil, and
- 3) reduce soil erosion.

Dissolved phosphorus and particulate phosphorus: Dissolved phosphorus is the phosphorus that remains in water after that water has been filtered to remove particulate matter. Phosphorus attached to the particulate matter that remains on the filter is called particulate phosphorus (i.e., phosphorus bound to the soil sediment). Together these two forms of phosphorus make up the total phosphorus concentration in a water sample. Dissolved phosphorus is the form that algae need to grow. Learn more at <http://lakeeriealgae.com/different-types-of-phosphorus/>.

Drawdown: Drawdown is the removal of nutrients from the soil by crops. It must be considered when making decisions about application of fertilizers.

Fertilizer: All plants are hungry for three primary nutrients: nitrogen, phosphorus and potassium. These elements are not supplied by photosynthesis but are found in soils and absorbed by the plant through its root system. Plant nutrients are manufactured so farmers can provide the exact minerals crops need to be healthy and grow.

Harmful Algal Blooms (HAB): When cyanobacteria (blue-green algae) grow due to high levels of phosphorus and nitrogen, they can produce toxins. These toxins are harmful to fish, wildlife and humans if present in high enough concentration.

Landsat photo: Various satellites used to gather data for images of the Earth's land surface and coastal regions. These satellites are equipped with sensors that respond to Earth-reflected sunlight and infrared radiation. The first Landsat satellite was launched in 1972. (Source: dictionary.com)



Macronutrients: Nitrogen, phosphorus and potassium are macronutrients that help plants with standability (ability to stay upright), sugar movement through the plant and yield production.

Macronutrient	Needed for:	If not enough (nutrient deficiency):
Nitrogen (N) - This nutrient cycles more quickly than either of the other two nutrients, therefore it is depleted more quickly.	-Growth -Photosynthesis	-Leaves turn yellow -Plants are small and spindly
Phosphorus (P) - This nutrient can be found in two forms: dissolved and particulate.	-Seed germination -Efficient use of water -Yield production	-Plants grow slowly -Late maturation -Plants are more likely to be affected by disease or drought -Leaves and stems may look purple or red
Potassium (K) - This nutrient is fundamental to seed and fruit development.	-Water use -Strong stalks (standability)	-Edges of leaves turn yellow or brown -Stems are weak and break easily -Root formation is damaged

Microcystin: A microcystin is a toxin produced by cyanobacteria (blue-green algae).

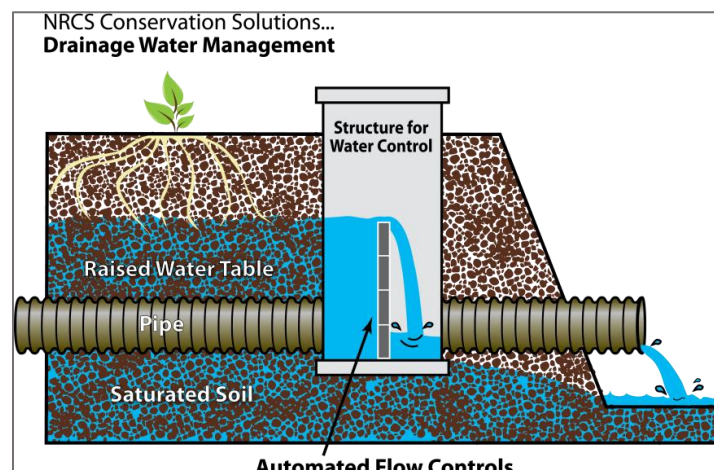
No-till management: No-till is a method of planting and harvesting that keeps the majority of soil undisturbed. A field that is considered no-till will have residue (e.g., stubble such as cut corn stalks) from the previous year's crop and the new crop is planted in the spring by making a furrow for the seed and covering it. There is no soil turned over or plowed.

Ozonation: The addition of ozone (O₃) in the drinking water process, which helps to destroy microcystin (toxin produced by blue-green algae) that is harmful to humans.

Runoff: Runoff is water from the land that enters a water source (ditch or creek). If a farmer uses no-till management, the runoff will have less sediment than using conventional tillage methods.

Strip till: Strip till is a tillage method that combines advantages of conventional tillage (fracturing compacted soil) without the disadvantages (drying out soil and loosening large amounts of soil particles to erosion).

Tile drain (subsurface drainage): A tile drain is a perforated plastic tubing under the ground typically between 3-6 feet below ground in many farm fields. Tile aids in draining away excess water to drainage ditches, culverts and creeks.



Variable Rate Technology (VRT): VRT allows farmers to control the amount of fertilizer (or seed or pesticides) applied in specific areas of a field at differing rates. VRT involves a computer in the tractor and software to read the soil map that is connected to special fertilizer application equipment such as the one pictured below:



Watershed: The area where water drains to a specific water body is called a watershed.

