Conservation Practice Overview

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Phosphorus Removal System (Code 624)

Phosphorus removal systems are flow through beds and chambers containing a sorption media which removes dissolved phosphorus via sorption from runoff and drain flows from agricultural lands.

Practice Information

Phosphorus removal systems remove dissolved phosphorus contained in runoff from agricultural lands. These systems can be used to treat runoff induced by precipitation, subsurface drains, and irrigation applications.

Phosphorus removal systems are installed at locations where flow is concentrated and able to be routed through a bed or a chamber containing phosphorus sorption media. Ideally, they are located near the edge of a field or a point where flow enters a drainage ditch or stream. The primary component of phosphorus removal systems designed to treat surface runoff is commonly a media bed within a concentrated surface flow path or enclosed basin. When utilized in a concentrated surface flow path, the media bed is constructed in the direct flow path with upstream and downstream structural supports to keep the bed stable and in place. When installed within enclosed basins, a small area is excavated with media placed over catch drains plumbed to an underground outlet. In subsurface drainage systems, drain effluent is typically routed to sub-grade media chambers or lined trenches filled with media which are plumbed to underground outlets. Systems are designed to accommodate larger flow events for respective site conditions as that is when the highest phosphorus loading typically occurs. However, systems are still designed to allow for flow to bypass the systems as necessary.

The amount of phosphorus removed from the flow is a function of the media characteristics, the length of time the flow is contained within the system, and the phosphorus concentration of the influent. Performance is highly dependent on the media. Media containing aluminum or iron are common due to their efficacy in removing phosphorus. Over time the media will become saturated with phosphorus and thus require replacement or regeneration. The conservation practice standard requires systems to be designed such that the sorption media has lifespan of at least 3 years while all other components have a lifespan of 10 years.

Common Associated Practices

NRCS Conservation Practice Standard (CPS) Phosphorus Removal System (Code 624) is commonly applied with CPSs such as Nutrient Management (Code 590), Cover Crop (Code 340), Drainage Water Management (Code 554), and Subsurface Drain (Code 606).

For further information, contact your local NRCS field office.