

Cropland **Planning Resource Management Systems**

Successful resource management on croplands is the correct application of a combination of practices which will meet the needs of the cropland ecosystem (soil, water, air, plant and animal resources) and the objectives of the land user.

Managing growing plants and/or their residues is the foundation upon which a cropland Resource Management System (RMS) is built. The practice Conservation Crop Rotation is an ESSENTIAL practice on cropland because it is the mechanism by which crops are grown and adequate residues are produced which sustain soil organic matter.

Residue Management (329A, B, & C or 344) are also ESSENTIAL practices and are selected based on the severity of sheet and rill erosion, ephemeral gully erosion, and/or the amount of residue necessary to sustain or improve soil organic matter. Typically on highly erodible cropland and/or sites with poor soil condition, the more intense residue management systems (i.e. No-Till, 329 A or Mulch-Till, 329 B) are required to reduce erosion to tolerable levels and/or have a positive impact on soil organic matter.

Conversely, on non-highly erodible cropland and/or fields with previously existing good physical condition, the less intensive residue management systems (i.e. Ridge-Till, 329C or Seasonal, 344) are usually sufficient to control erosion and sustain soil organic matter. Cover Crops (340) will be essential if additional ground cover, canopy, and biomass are needed to control erosion and/or have a positive impact on Soil Conditioning Index (SCI).

Nutrient Management (590) becomes an ESSENTIAL practice when plant nutrients will be applied and requires a nutrient budget for nitrogen, phosphorus, and potassium. When all or part of plant nutrients are supplied by organic by-products (i.e. animal manure) Waste Utilization (633) becomes an ESSENTIAL practice and a site specific risk analysis for phosphorus index is required. When organic by-products are applied to cropland, Nutrient Management is planned in conjunction with Waste Utilization.

Pest Management (595) becomes an ESSENTIAL practice when pest control methods (cultural, mechanical, or chemical) are to be applied. Additionally, when pest control is accomplished through the use of pesticides, a soil/pesticide interaction analysis is performed and mitigating practices installed if the analysis produces a human risk rating of intermediate or higher. The WIN-PST Pesticide Screening Tool is used for soil/pesticide interaction analysis.

Crop residues produced and managed (or added) in specific amounts are generally necessary for erosion control and to sustain or improve soil organic matter. The amount needed for improvement can be the same as that for erosion control, or an additional specific amount may be needed. The Soil Conditions Index will be used to determine the amount of residue needed to sustain or improve soil organic matter.

Other conservation measures may be necessary to achieve land user objectives and protect resources. These measures may or may not have standards and specifications or be enumerated, but need to be considered in planning a RMS. Several examples might be

controlled traffic, tillage kind, tillage timing based on soil type and moisture, and the amount of tillage (number of trips).

Supporting practices to control sheet and rill erosion or ephemeral gully erosion may also be needed. Examples of these practices are Terraces, Diversions, Grassed Waterways, or strip cropping (contour or field). Buffers such as Filter Strips and Field Borders can be used to enhance RMS's by improving quality of runoff, providing wildlife habitat, and adding diversity to the landscape. The following is a list of practices applicable to cropland:

ESSENTIAL PRACTICES – (required practices)

- Conservation Crop Rotation (328)
- Residue Management (329A-C, 344) (Not all required at same time on same acres)
- Nutrient Management (590) (If nutrient applied)
- Pest Management (595) (If pesticide applied)
- Waste Utilization (633) (If animal waste applied)
- Irrigation Water Management (499) (If irrigated)

NEEDED PRACTICES - (required practices when needed to address site specific resource concerns)

- Cover Crop 340 (substitutable for residue management)
- Terrace (600)
- Diversion (362)
- Grassed Waterway or Outlet (412)
- Surface Drainage (606, 607, 608)
- Grade Stabilization Structure (410)

DESIRABLE PRACTICES - (practices that facilitate or enhance essential practices)

- Stripcropping (585, 586)
- Precision Land Forming (462)
- Deep Tillage (324)
- Contour Farming (330)
- Irrigation Water Conveyance (428 A-C)
- Field Border (386)
- Filter Strips (393)
- Row Arrangement (557)
- Upland Wildlife Habitat Management (645)
- Wetland Wildlife Habitat Management (644)