

Conservation in the Mississippi DELTA

paul.rodrique@ms.usda.gov



Resource Concerns: the principal resource concerns in the DELTA are: water quality (sediment, nutrients), water quantity (aquifer overdraft) and wildlife (habitat restoration).

Initiative Partnerships: NRCS cooperates with several local partners in the DELTA to provide Initiative Programs. All initiatives are actually collaborative efforts of all the partners. These include: Mississippi Soil and Water Conservation Commission and local Soil and Water Conservation Districts (Mississippi River Basin Initiative {MRBI}), Delta F.A.R.M./Delta Wildlife (CCPI-DELTA), Yazoo Mississippi Delta Water Management District (Agricultural Water Enhancement Program {AWEP}). These partners are also represented in local workgroups for county based programs and initiatives.

Coordinating organizations: The conservation efforts in the DELTA are coordinated with and supported by other agencies and organizations such as the Mississippi Department of Environmental Quality, Mississippi Farm Bureau, The Nature Conservancy, U.S. Army Corps of Engineers (COE), Agricultural Research Service (ARS), Mississippi State University (MSU), Alcorn University, Farm Service Agency, and United States Geological Survey.

Planning: The DELTA is fortunate that the planning process has allowed the adoption by the partners of suites of practices within NRCS guidelines that can address all the major resource concerns of the DELTA , so that all the initiatives complement and build upon one another.

Practice Suites: The DELTA partnership has promoted the following suites of conservation practices in the DELTA to address the broadest range of resource concerns.

Pads/pipes/winter flooding: This suite consists of Dikes (356), Water Control Structures (587), and Drainage Water Management (554) along with Irrigation Land Leveling (464) in some initiatives. Elevated turn rows are built along the perimeter of the field. Drainage is directed to water control structures, typically 2 per field. This controls runoff, causes ponding, and accelerates sediment deposition within the field. For irrigated land, the irrigation outflow is controlled by the water control structure. In the non-growing season, the water control structure is used to seasonally flood the field, further enhancing sediment and nutrient retention while providing wildlife habitat. Irrigation landleveling allows for the precise management of water in these fields. *ARS and MSU have demonstrated that sediment reductions of 60% can be obtained. The COE has also found sediment and nutrient reductions from BMP suites.* Pads and Pipes function like filter strips or vegetative barriers.

Resources addressed: Water Quality, Water Quantity, and Wildlife.

On-Farm Storage: this suite consists of Irrigation Storage Reservoir (436), Pumping Plant (533), and Irrigation Water Conveyance (430). A large embankment reservoir (pond) is constructed along with a tailwater recovery (TWR) pit. In the non-growing season, the TWR pit is used to capture storm runoff and a pumping plant is used to fill the reservoir. This water is stored until the following summer when the stored water is pumped through the irrigation water conveyance system to fields for irrigation reducing groundwater pumping. During the irrigation

season, the TWR pit captures irrigation return flows, enhancing irrigation efficiency, which can be returned to the fields directly or stored in the reservoir for future use. This essentially makes a “closed” system. *Stormwater runoff and its associated constituents (sediment, nutrient, pesticides) can be reduced by 50%, while groundwater use can be reduced by 75%.* Ponds, TWR pits, and required buffers provide wildlife habitats.

Resources addressed: Water Quality, Water Quantity, and Wildlife.

Tailwater Recovery: this suite consists of Irrigation Storage Reservoir (436), Pumping Plant (533), and Irrigation Water Conveyance (430). A Tailwater Recovery (TWR) pit is constructed without a reservoir. In the non-growing season, the TWR pit functions as a detention basin to mitigate storm runoff, reducing peak runoff, increasing sedimentation, and allowing the processing of nutrients. During the irrigation season, the TWR pit captures irrigation return flows which is be returned to the fields directly by the pumping plant and irrigation water conveyance system. This enhances irrigation efficiency to 95%-100%. *Irrigation runoff, and its associated constituents (sediment, nutrient, pesticides) can be eliminated, while groundwater use can be reduced by 25-30%.* TWR pits, and required buffers, provide wildlife habitats.

Resources addressed: Water Quality, Water Quantity, and Wildlife.

Edge of Field/Farm Treatments: this suite consists of Constructed Wetlands (656) and/or Vegetated Agricultural Drains (607). These treatments are designed to slow runoff, provide maximum vegetative contact, and increase detention times allowing infiltration, deposition, and nutrient reduction. *A 6 acre wetland/pond system to treat 400 acres of cropland was demonstrated by ARS in Louisiana to reduce nutrient exports by over 35%.* Vegetated agricultural drains have also been demonstrated by ARS and MSU to achieve nutrient reduction benefits. ARS has additionally demonstrated that designing conservation practices to provide temporary, seasonal, or semi-permanent water, greatly increases wildlife diversity and abundance. However, 656 and 607 should not be used for wildlife benefits as a primary purpose due to possible concentration of pollutants, although wildlife will benefit.

Resources addressed: Water Quality, Water Quantity, and Wildlife.

Additional practices: many additional practices are used to complement and enhance these primary suites of practices including, but not limited to:

- 590 – Nutrient Management
- 449 – Irrigation Water Management
- 443 – Irrigation System Surface and Subsurface (for flowmeters, timers, and drop nozzles)
- 646 – Shallow Water Management for Wildlife
- 647 – Early Successional Habitat Management (Native Warm Season Grasses, Pollinators)
- 601 – Vegetative Barriers
- 327/329/340 – Conservation Cover/Residue Management/Cover Crop
- 397 – Aquaculture Ponds (Split Pond System)
- 410 – Grade Stabilization Structure