# Drainage ditches can help clean up field runoff

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ARS ecologist Matt Moore has found that vegetated drainage ditches can be a low cost way for farmers to capture pesticides and excess nutrients in runoff from fields.

Vegetated drainage ditches can help capture pesticide and nutrient loads in field runoff, U.S. Department of Agriculture (USDA) scientists report. These ditches—as common in the country as the fields they drain—give farmers a low-cost alternative for managing agricultural pollutants and protecting natural resources.

Agricultural Research Service (ARS) ecologist Matt Moore at the agency's National Sedimentation Laboratory in Oxford, Miss., and his

colleagues conducted the research. ARS is USDA's chief intramural scientific research agency.

Until recently, the primary function of many edge-of-field ditches was to provide a passage for channeling excess water from crop fields. Many farmers controlled ditch vegetation with trimming or dredging to eliminate plant barriers that could impede the flow of runoff.

But in one of Moore's first studies, he evaluated the transport and capture of the herbicide atrazine and the insecticide lambda-cyhalothrin for 28 days in a 160-foot section of a vegetated agricultural drainage ditch in Mississippi. One hour after he started a simulated runoff event, 61 percent of the atrazine and 87 percent of the lambda-cyhalothrin had transferred from the water to the ditch vegetation. At the end of the ditch, runoff pesticide concentrations had decreased to levels that were generally non-toxic to downstream aquatic fauna.

Moore also conducted work in California and determined that vegetated drainage ditches helped mitigate pesticide runoff from tomato and alfalfa fields. As a result, USDA's Natural Resources Conservation Service (NRCS) state office in California included vegetated agricultural drainage in their Environmental Quality Incentives Program (EQIP). This meant farmers who installed the ditches could be reimbursed for up to 50 percent of the cost. Moore's research also contributed to the decision by NRCS managers in Mississippi to include vegetated agricultural drainage ditches in the state's EQIP.

The research was published in *Ecological Engineering*, *Environmental Pollution*, *Journal of Environmental Quality*, and elsewhere.

**More information:** Read more about Moore's studies in the January 2013 issue of Agricultural Research magazine. www.ars.usda.gov/is/AR/archive/jan13/ditch0113.htm

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