

BEST MANAGEMENT PRACTICES
FOR PESTICIDE STEWARDSHIP IN
RICE PRODUCTION IN THE
LOWER MISSISSIPPI VALLEY ALLUVIUM



FARMERS ADVOCATING RESOURCE MANAGEMENT


DELTA F.A.R.M.

Publication supported by EPA Project X8-96499108-0

Delta F.A.R.M. P.O. Box 257 Stoneville, MS 38776 www.deltafarm.net 662-686-3370

2010

Best Management Practices For Pesticide Stewardship in Rice Production in the Lower Mississippi Valley Alluvium

Developed by Delta F.A.R.M. under advisement from:

Tom Allen

Mississippi State University, Delta Research and Extension Center, Plant Pathologist

Jason Bond

Mississippi State University, Delta Research and Extension Center, Weed Scientist

Nathan Buehring

Mississippi State University, Delta Research and Extension Center, Rice Specialist

Don Cook

Mississippi State University, Delta Research and Extension Center, Entomologist

Wayne Ebelher

Mississippi State University, Delta Research and Extension Center, Research Professor

Jeff Gore

Mississippi State University, Delta Research and Extension Center, Entomologist

Rick Kesler

FMC Corporation, Business Services Manager

Trey Koger

Mississippi State University, Delta Research and Extension Center, Soybean Specialist

Erick Larson

Mississippi State University, Grain Crops Agronomist

Ronnie Levy

Louisiana State University, Ag Center, State Soybean, Corn, Sorghum Extension Specialist

Steve Martin

Mississippi State University, Delta Research and Extension Center, Ag Economist & Head

Kim Morgan

Mississippi State University, Extension Economist

Carol Somody

Syngenta Crop Protection, Senior Stewardship Manager

Brian Ward

Certified Crop Advisor, Licensed Pest Management Consultant

Other sources for information used in this document came from:

- The First 40 Days
- Southern Region IPM Center
- Louisiana Master Farmer Program

Best Management Practices for Rice Production

Crop Rotation

During the short-term, some crop rotations can reduce weed, disease, insects, and nematode pressure and needed pesticide applications. Long-term benefits include improved soil quality, fertility, and moisture retention. This may reduce N-P-K requirements over time. Certain crop rotations can also be used as a pesticide resistance management tool for Lower Mississippi Alluvial Valley (LMAV) weeds, insects and nematodes.

Residue Management

Rice residue management is a serious struggle. Other techniques are used, but generally, significant fall tillage is necessary. Fortunately, this minimizes or eliminates the need for the fall applications of residual herbicides, especially if fields will be impounded with water over the winter months for waterfowl and/or winter weed control. This also accelerates the decomposition rate of crop residue in the fall, reducing the potential for various crop pests to overwinter in crop residues.

Mixed Fertilizer Applications

Soil testing for P and K (often referred to as mixed fertilizer) is recommended by all LMVA state Extension Services, but is not used as often as needed. Fertilizer applications should be made AS NEEDED according to soil test values. This can be accomplished through precision soil sampling methodologies and using variable rate application techniques for mixed fertilizers. While these techniques may represent an added cost to producers, the investment could provide for a return in fertilizer savings or greater yields. Furthermore, some producers can receive cash incentives for these practices through EQIP and/or CSP, both administered by the USDA Natural Resources Conservation Service. Ultimately, good soil fertility makes for healthy plants that typically do not require as many pesticide applications (primarily herbicides and insecticides).

Spring Seedbed Preparation

Spring herbicide applications, commonly known as the “burn down” application, are first used to control winter and spring weeds. And while spring “burn down” applications are used in rice production, it is not as important as in other crops. Spring tillage is more important in rice production because of the seed bed requirements needed for rice planting and uniform, healthy germination. But whether tillage is used alone or in combination with herbicide applications, winter and spring weeds are eliminated as are the habitats for any overwintering insects. Furthermore, superior seed bed preparation provides a greater opportunity for early harvest and minimizing late season pest management needs, specifically fungicide and insecticide applications.

Pesticide Application Methods

Various practices, techniques and technologies should be incorporated into all pesticide applications (insecticide, herbicide, foliar fungicide, etc...). The following should be considered:

- Ground Application may be better than aerial applications for insect control
- Time applications when weather conditions are favorable.
- Tank mixes should only be used when necessary, not as an automatic or insurance application to potentially save a trip across the field later.
- Droplet Size should be optimum for each different product, chemistry and volume needed.

Resistance Management

Multiple chemistries and approaches should be taken when managing pests of any kind.

Optimize Planting Times

Optimum planting dates for rice in the LMAV vary. But general consensus among professionals suggests that planting should occur as early as possible within regional, state and varietal guidelines. First, this generally provides for a positive yield response in rice. It is also the first critical step in producing a crop that is ready to harvest as early in the growing season as possible. Early harvest reduces irrigation needs and risks associated with mid to late season pests (rice water weevil, stink bugs and disease) and weather (hurricanes). By eliminating the potential for late season pests, late season insecticide and foliar fungicide applications may be avoided in the LMAV.

Seed Treatments

Fungicide seed treatments in rice should almost always be used in the LMAV. The treatments greatly improve germination and help achieve “earliness,” reducing the potential late season pesticide applications.

Multiple Nitrogen Applications

Multiple nitrogen applications are needed for optimum N uptake and plant utilization. This fosters rapid growth and maturity of healthy plants, further contributing to “earliness.” This ultimately reduces the potential for late season insecticide and foliar fungicide treatments.

Variety Selection

Proper variety selection is critical. The following varietal traits should be considered:

- Genetics package that reduces the total number of pesticide applications that would typically be needed when using conventional varieties or replaces the use of higher risk pesticides
- Early maturity reduces the potential for late season pests reducing the need for late season insecticide and foliar fungicide applications.
- Semi-dwarf cultivars reduce the potential for lodging.
- Disease resistant cultivars can greatly reduce the dependency on fungicides for foliar disease control.

Irrigation

Irrigation is required for rice production in the LMAV. Sustained flood irrigation is preferred and the most widely accepted form of rice irrigation. This irrigation system promotes N retention and uptake and greatly reduces weed pressure and subsequent need for herbicide applications.

Preventative Fungicide Application

While the merit of a preventative fungicide application in rice production systems are still being debated in the LMAV, significant yield responses have been documented in some rice varieties.

Harvest Aids

Most rice fields DO NOT need applications of harvest aids like sodium chlorate to adequately “dry down” rice before harvest.

Independent Crop Consultants

Crop consultants can help producers identify alternative pest management strategies if they are called upon to do so. However, complete and comprehensive pest management must begin before seeds are planted. Historically, consultants are only engaged or hired by producers in the LMAV to “scout for pests” and to advise producers on treatments from crop emergence through maturity. If more crop consultants were engaged earlier in the year, and allowed to work with the producers from a comprehensive approach, many pest issues could be avoided all together. This includes advisement of BMPs like fall residue management, tillage practices, spring burn down applications, variety selection and fertility. Crop consultants must be engaged throughout the entire year to best advise producers on proper economic and environmentally sound pest management practices. Crop consultants also have the greatest potential to reduce or stop the use of unjustified “automatic” pesticide applications