

BEST MANAGEMENT PRACTICES
FOR PESTICIDE STEWARDSHIP IN

SOYBEAN PRODUCTION IN THE
LOWER MISSISSIPPI VALLEY ALLUVIUM



FARMERS ADVOCATING RESOURCE MANAGEMENT

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Publication supported by EPA Project X8-96499108-0

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2010

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

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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 Soybean Production

Crop Rotation

Crop rotations can increase soybean yields in the LMAV by 10-15%. 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

Soybean residue is minimal compared to other crop residue like corn and rice. Fall tillage may be a good choice for residue management and can reduce the need for the fall applications of residual herbicides. Impounding winter water on fields is another way to manage soybean residue, provide wildlife habitat and reduce spring fall and spring herbicide requirements. Both fall tillage and flooding accelerates the decomposition rate of crop residue in the fall. Fall residual herbicide applications can also be used in no-till or reduce-till systems that are not flooded with winter water. By eliminating crop residues and winter weeds, subsequent over-wintering habitats for insect and disease pests are minimized. This reduces the need for planting and early season pesticides applications.

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 Burn Down

Spring herbicide applications, commonly known as the “burn down” application, are first used to control winter and spring weeds and prepare clean seed beds for planting without using spring tillage. But spring burn down applications do much more than just control weeds. By removing winter and spring weeds, you also remove the host plants needed by numerous LMAV pests. Without these host plants, the pests are not able to survive and transition to newly emerged soybean seedlings.

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 is typically better than aerial applications for insect control and can be applied as a band during the early season to reduce pesticide inputs
- Time applications when weather conditions are favorable.
- Tank mixes should only be used when necessary, not as 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.

Row Width

Weed pressure is greatly minimized once soybean plants “canopy.” Therefore, the shorter the amount of time it takes for soybeans to “canopy,” the shorter the period of time that herbicides are needed to control weed pressure. This reduces potential mid-season herbicide applications. Narrow row spacing generally allow for soybean canopy closure to be reached more quickly than wider row spacings.

Resistance Management

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

Optimize Planting Times

Optimum planting dates for soybeans in the LMAV vary, but general consensus among professionals suggests that planting should occur as early as possible within regional, state and varietal guidelines. The goal is simply to ensure an early harvest. Early harvest reduces irrigation needs and risks associated with late season pests (loopers & stink bugs) and late season weather threats (hurricanes). Furthermore, optimum planting provides a positive yield response. Without the threat of late season insects, late season insecticide applications can be greatly reduced.

R3/R4 Fungicide Application

In the LMAV, foliar disease including soybean rust can lead to a yield-limiting situation. Three or more fungicide applications may be needed to treat some of these diseases. While the science is still begin developed, preliminary information and the opinion of many crop consultants suggest that one automatic fungicide application, typically at the R3/R4 growth stage and generally with a strobilurin chemistry, should be used on soybeans in the LMAV to prevent foliar fungal diseases. One preventative application is better than three or more combative applications. Many producers have already begun to implement this practice but sometimes will also choose to include an insecticide in the tank mixture with the fungicide treatment. This insecticide treatment, coupled with the R3/R4 fungicide treatment, is NOT always needed, unless specifically recommend by the grower's independent crop consultant.

Seed Treatments

Fungicide and insecticide seed treatments for soybeans should almost always be considered in the LMAV, especially for early-planted soybeans. Some treatments allow soybeans to reach a more uniform stand and aid in early season vigor. Seed treatments greatly reduce the potential need for early season insecticide applications and late season insecticide and fungicide applications associated with later maturing soybeans. Furthermore, seed treatments typically represent a very small volume of preventative chemistry in the environment, as compared to alternate application methods.

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 could be required when using conventional varieties or reduces the potential use of a higher risk pesticide.
- Early maturity reduces the potential for late season pests reducing the need for late season insecticide and foliar fungicide applications.
- Drought tolerance reduces plant stress and encourages a healthier, more pest resistant plant.

Irrigation

Timing, duration, frequency and volume of irrigation are critical to foster rapid and healthy plant growth through maturity. Healthy plants can be much more resistant to pest pressure and may not require the same amount of pesticide applications as compared with non-irrigated, drought stressed plants. However, late season irrigation can also prolong plant maturity, attract late season insect and disease pressure, and increase the need for harvest aids. Timing of soybean irrigation is critical to maximize yields without unnecessarily prolonging production and attracting late season pests.

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, irrigation 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.