

Environmental Management

I. SOIL AND WATER MANAGEMENT

Soil and water management refers to the utilization of soil and water with a particular focus on implementing practices that promote agricultural sustainability. Some aspects of soil and water management are currently regulated by the United States Department of Agriculture National Resources Conservation Service.

Good Agricultural Practices

Soil Management

- Soil should be regarded as a dynamic, living and fragile resource.
- Criteria for site selection for tobacco production should be established taking into consideration:
 - soil type,
 - slope,
 - drainage, and
 - cropping history i.e. rotation.
- Plan rotations of growing sites 2-3 years in advance for better management of soil and water resources and pest management.
- Growing tobacco on land classified as Highly Erodible Land should be avoided unless conservation practices are used.
- Conservation tillage systems should be implemented where feasible and needed.
- Contour planting and conservation practices such as terraces or strip planting should be implemented where adequate rotation with sod crops or conservation tillage is not possible.
- Recommended nutrient management practices should be followed
- Cover crops should be used when not rotating to a fall seeded crop. Cover crops are planted to protect and improve the soil without the intent of being harvested. Soil should be covered with living crops or crop residues for as long as possible to prevent losses by erosion or the harmful action of extreme temperatures.
- Cover crops should be:
 - small grains, or
 - other fall seeded, cold tolerant species suitable to the environment which are not hosts for tobacco disease organisms.

Water Management

- Safeguard water supplies by:
 - Not mixing or applying agrochemicals near surface water or waterways.
 - Not allowing fertilizers or agrochemicals to enter waterways.
 - Protecting irrigation water sources from contaminations by agrochemicals and fertilizers.
 - Avoiding wastage of water by monitoring water usage.
 - Not allowing fertilized water from greenhouse seedling float production and other sources to contaminate water supplies.
 - Following all State and Federal Environmental Protection Agency label requirements for agrochemical use.
 - Maintaining buffer area between farmland and environmentally sensitive areas.
 - Strategically placing buffer strips in the agricultural landscape to effectively reduce the movement of sediment, nutrients, and agrochemicals.

Documentation

- Keep records of cropping history, slope, and soil type of fields/tracts in tobacco production.
- Keep records on crop rotation and tillage practices (conventional, strip, or no-till) for at least the two previous growing seasons.
- Keep records of cover crops for fields not rotated to fall seeded crops.
- Keep records of farm practices that are designed to conserve the land and protect the water supply, such as erosion control using grass borders or grass waterways.
- If applicable, conservation plan which meets conservation compliance requirements on highly erodible land (on farm or at the local Soil and Water Conservation District office).

Inspection List

- Does the grower have crop rotation plan?
- Does the grower list tillage practices (conventional, strip, or no-till options)?
- Does the grower have conservation plans for highly erodible fields?
- Are cover crops used to prevent bare soil in winter?
- Do you have adequate buffer zones around bodies of water and drainage areas?
- If irrigating, is grower's decision to irrigate based on the degree of crop stress?
- Are there grass borders, grass waterways, or buffer areas where needed?

II. AGROCHEMICAL MANAGEMENT

Agrochemical use is often necessary in the production of agricultural crops such as tobacco. Agrochemicals should be used in conjunction with alternative pest, weed, and disease management measures. Agrochemical use should be minimized and be in accordance with IPM principles and with a view towards environmental acceptability and worker protection. Sound agrochemical management programs address the importance of legal, safe, and environmentally responsible agrochemical selection, handling, application, storage and disposal.

Good Agricultural Practices

- Use agrochemicals according to IPM principles, considering worker safety and environmental protection.
- Use only agrochemicals that are labeled for tobacco in the state in which the tobacco is grown.
- Some contracting companies have additional restrictions regarding agrochemical use. Be sure to follow all contract requirements.
- Follow all aspects of the label instructions including: safe application methods, the use of personal protective equipment (PPE), mixing, handling, re-entry and pre-harvest interval time frames, storage requirements, correct disposal of containers and residual spray solution.
- Follow all requirements of state and national regulations related to worker protection and agrochemical use.
- Know the hazards and risks posed by agrochemicals, and give attention to safe working practices, adequate training of workers, emergency and accident action plans, health surveillance and record keeping.
- Prohibit eating, drinking and smoking while handling, mixing or applying agrochemicals and in areas where agrochemicals are stored. Provide decontamination and fully supplied washing stations.
- Prohibit mixing and applying agrochemicals near water sources such as wells or near open waterways.
- Consider effects on subsequent crops.

Other key principles and practices when using agrochemicals:

- Adhere to all legal requirements when using agrochemicals. The label is the law.
- Post signs with appropriate information in fields treated with agrochemicals regarding the Restricted Entry Interval (REI) as required by agrochemical labeling.
- Address applicator safety and adequate training before handling or applying any agrochemical.
- Fully consider the product choice and application in relation to the IPM strategy, worker safety, and the environment.
- Apply pest control agents only when crop monitoring indicates that the economic threshold level has been reached. Utilize resources such as the University agricultural specialists and agents.
- Minimize agrochemical use in terms of volume and range through targeted application and spot treatments.

- Use the minimum rate necessary of an agrochemical to achieve control.
- Wear appropriate protective clothing as stipulated on the product label when handling, mixing and applying agrochemicals.
- Maintain and inspect all personnel protective equipment (PPE) issued to all individuals involved with the handling, storage and use of agricultural chemicals.

In the selection of agrochemicals, it is important that:

- The approved product selected is the least toxic and least persistent available and is as safe as possible to humans, wildlife and the environment while providing effective management of the pest, disease or weed problem.
- It has been selected to suit the situation and minimizes harm to natural predators of the pests.
- It is specific in mode of action and not broad spectrum when possible.

In the specific use of maleic hydrazide, it is important that:

- It has been intensely managed and applied in a manner that results in the lowest residue levels possible.

Agrochemical storage:

- Store agrochemicals in facilities that are suitable and designated for that purpose, and well away from wrapping materials and leaf, combustibles and anything that could serve as an ignition source.
- Store all agrochemicals as recommended on the Material Safety Data Sheets (MSDS) to ensure that the physical conditions of the storage are appropriate.
- Store only in original containers. Pay special attention to chemical flash points, maximum safe storage temperature, humidity restrictions.
- Identify all products designated as flammable or reactive and isolate these agrochemicals.
- Keep all agrochemicals well away from any fire hazard or flammable materials.
- Secure all storage areas to prevent unauthorized access especially by children, straying farm animals and wildlife. Clearly display appropriate warning and danger signs to prevent accidents.
- Ensure that the construction and maintenance of the storage structure and its contents will prevent contamination of water sources from the contents.
- Ensure that there is a means for containing spilled or washed-down material within the storage area - e.g. a containment area – and sufficient absorbent material for spill containment.
- Store agrochemicals in original manufacturer's containers. If the original label becomes misplaced record the EPA Registration Number, brand name, active ingredient and their percentages, use classification on the label and signal word and write or paste this information on the container.
- Any partially used containers must be closed firmly.
- Never store agrochemicals in any container designed to hold food, feed, beverages, or medicine.
- Develop and maintain an emergency action plan to deal with unforeseen circumstances such as accidental spills, fires and flooding.
- Keep inventory of stocks, MSDS and specimen labels outside the storage area and ensure that they are available to the emergency services.
- Keep to a minimum the amount of agrochemicals in storage by only purchasing what is required.



Agrochemical disposal:

- The correct disposal of unwanted concentrated products and empty containers is an essential part of safeguarding human health and the environment.
- Prohibited disposal procedures for any pesticide or pesticide container include open dumping, water dumping, ocean dumping, and any violation of disposal requirements on the pesticide product labeling. Most states also prohibit open burning.
- When purchasing large volumes of chemicals, the contract should include the right to return to the supplier unused stocks contained in the original unopened container within an agreed period.
- In the disposal of old stocks, the containers should be in sound condition prior to dispatch for disposal.
- All empty containers must be rinsed at least three times, pressure rinsed or equivalent before disposal and rendered non-reusable (e.g. punctured). Where possible, empty agricultural pesticide containers should be recycled at sites that accept properly rinsed containers.
- It should be determined whether the supplier or manufacturer, or your local government has a pesticide container recycling program. General recycling programs should not be used for pesticide containers.
- An empty non-refillable pesticide container should not be used to store anything other than the original pesticide product that is listed on the label.
- Agrochemical rinse water should be captured and used for mixing future applications or applied to the crop.

Requirements for Agrochemical Management:

- Maintain an up-to-date pesticide applicator license if applying restricted-use agrochemicals.
- Keep copies of labels for all agrochemicals used in tobacco production, and Materials Safety Data Sheets (MSDS) or Safety Data Sheets (SDS) for all agrochemicals stored on the farm.
- Keep application records which include dates of application, product brand name, EPA #, Active Ingredients, Restricted Entry Interval, rate applied, location and size of treated area.
- Attend Extension or other training/meetings to stay up-to-date on agrochemicals.
- Keep records of training provided to workers who will be handling or applying pesticides for the proper storage, handling, application, and disposal of agrochemicals. Records of training required by the Worker Protection Standards must be kept at least two years.
- Store agrochemicals away from tobacco in a lockable area with appropriate signage.
- Follow proper procedure to recycle or dispose of agrochemical containers.
- Calibrate all sprayers at least once per year.

Documentation

- A copy of pesticide applicator's current license
- Records of:
 - agrochemical labels and applications
 - who performs chemical applications
 - reason for application
 - Restricted Entry Interval (REI) by field ID
 - pesticide training dates and certification
 - Worker Protection Standards training
 - sprayer calibration
- Copies of Material Safety Data Sheets (MSDS) or Safety Data Sheets (SDS) for stored agrochemicals

Inspection List

- Are chemical storage areas secure, dry, and properly signed, with spill containment features adequate and appropriate for the nature and volume of the stored materials?
- Are all restricted-use chemical applications on tobacco performed by a licensed pesticide applicator or supervised by a licensed pesticide applicator?
- Are workers that handle agrochemicals trained in the proper storage, handling, application and disposal of tobacco agrochemicals?
- Does the grower have Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS) for each agrochemical stored and used for tobacco production?
- Do agrochemicals have their original labels and are they stored in their original containers?
- Does the grower attend meetings on agrochemicals labeled for tobacco?
- Does the grower use published information (production guides, newsletter, and/or documentation from consultations with Extension/chemical representative) to determine the best tobacco agrochemical management activity?
- Are only pesticides approved for use on tobacco applied?
- Are all tobacco agrochemical applications documented? If so, does the documentation contain weather conditions at time of application and the reason for applying tobacco agrochemicals?