



Crop & Environmental Management

HOW YOU GROW MATTERS

HOW YOU GROW MATTERS: CROP MANAGEMENT

OPERATION AND NUTRIENT MANAGEMENT

PRINCIPLE

A desirable nutrient management plan meets the needs of the crop, minimizes the costs to the grower, and minimizes the impact on the environment. Recording information about fields and applications helps to plan an effective nutrient management strategy.

CRITICAL STANDARDS

- If required in your watershed, comply with nutrient management regulations as applicable.

ADDITIONAL STANDARDS

High

- Keep records of all nutrient applications- greenhouse, transplant water, and field (soil and foliar), which includes date of fertilizer application, application timing (pre-plant, side-dressing, transplanting, or foliar), type of fertilizer applied (N-P-K), and rate of application. This includes lime applications.
- Follow Extension recommendations if Muriate of Potash is applied as recommendations on when and how much vary depending on the growing region and type of tobacco grown. Links to University Extension Production Guides can be found at www.gapconnections.com.

Medium

- Make fertilizer application decisions using soil test results that are no more than three years old before the time of transplanting.
- If using animal manure or litter for fertilizer, have it tested for nutrient content to determine appropriate rates. Guidelines on the use of animal manure in tobacco production can be found in University Extension Production Guides which can be found at www.gapconnections.com.

INTEGRATED PEST MANAGEMENT

PRINCIPLE

Growers should implement diverse methods of pest controls, paired with monitoring to reduce unnecessary pesticide applications to decrease potential human health risks and adverse environmental effects. CPAs should be used after other practical alternative pest, weed, and disease management measures have been utilized. Given the hazards associated with CPA use, it is important that the people who use them are informed and trained.

CRITICAL STANDARDS

- All CPA applications, restricted or non-restricted, should be completed or supervised by a licensed pesticide applicator. This includes organic growers using only non-restricted CPAs.
- Follow label instructions when applying CPAs.
- Use only CPAs that have been approved by the EPA for use on tobacco (labeled). Always refer to your grower contract; some buyers may prohibit use of CPAs which are labeled for tobacco.

- Keep field/tract records of all CPA applications, including in the greenhouse, transplant water and field.
This includes:
 - CPA common name
 - Active Ingredient
 - Application date
 - Application method (transplant water, hand sprayer, overhead sprayer, etc.)
 - Rate
 - Name of Applicator
 - Field name and location
 - EPA Number
 - REI

Note: Growers may use a reference sheet such as the “CPA Reference Sheet” found in the GAPC records to record brand name, EPA registration number, active ingredient, and REI to avoid writing this information for each individual application. This reference sheet must be kept with the records of the individual agrochemical applications.

ADDITIONAL STANDARDS

High

- Keep field/tract records of all CPA applications, including greenhouse, transplant water and in the field.
This includes:
 - Pest targeted or reason for application
- Use established economic thresholds for pests and apply CPAs for those pests only when exceeded as confirmed by scouting and monitoring.
- Use low-toxicity or pest targeted CPAs instead of more toxic broad-spectrum CPAs when available and applicable.
- Use environmentally and biologically methods to control pests with available and applicable.
- Maintain pesticide application records for the previous two growing seasons as well as the current season.
- Maintain calibration records for current year

Medium

- Have a documented scouting program for pests and record the scouting information by field/tract following GAP standards.
- Scouting should be done at a minimum of every two weeks after crop establishment and records should include the following:
 - Field scouting dates
 - Pests observed and identified
 - Field/tracts where pests were identified
 - Level of infestation of pests identified (i.e., percent of plants affected/infested)
 - Corrective actions taken by field and date (i.e. crop protection agent (CPA) applications made by field and date)
 - Follow-up of your pest control practices to determine the effectiveness of the action taken
- Look for and count beneficial insects when you are scouting.

- Use appropriate methods such as washing, steaming, bleaching, or use of commercial tray cleaner to clean or sanitize transplant trays in the production of seedlings.
- Destroy unused seedlings within 30 days after transplanting is completed.
- Destroy crop residues and establish a cover crop within 60 days after harvest.

CROP OPERATIONS MANAGEMENT

PRINCIPLE

Implementing acceptable agronomic and industry requested practices from planning to post harvest will help achieve industry acceptable and quality production. Observation and records of variety disease resistance, yields, and other characteristics will assist in planning future quality and productive crops.

CRITICAL STANDARDS

- Direct the day-to-day activities involved in producing the tobacco sold under your name, the name of an Associated Grower, employee, or the name of the farming operation.
- AIR and FIRE ONLY: Use only Low Converting seed for tobacco production.
- Use only Certified and non-GMO seed for tobacco production.
- Whether you produce or purchase your tobacco plants, keep records of transplant/greenhouse seeding dates, varieties, and seed lot numbers by field/tract.
- Keep tobacco types strictly separated from each other during seeding, curing, and market preparation.
- If tarps are used to cover tobacco during transport, use tarps made of non-plastic material on the side of the tarp in contact with the tobacco when covering it during transport and ensure all surfaces used in transport are free of contaminants.
- If an enclosed trailer or vehicle is used to transport tobacco to market, all surfaces should be free of contaminants. Stock trailers should not be used for tobacco transport.

ADDITIONAL STANDARDS

Medium Risk

- Select tobacco variety based on, disease resistance, curing characteristics, cured leaf quality, and yield, and maintain documentation of sources you used to select your tobacco varieties (examples are seed company literature, university production guides, buying company recommendations, etc.)
- Keep records of transplanting and topping dates by field/tract.
- Use recommended measures to control weed seed contamination of tobacco.

Low

- Keep records of plant and row spacing and plant population maintained by field/tract.
- Prior to harvest, mow all field borders, turning areas, and manual removal of pigweed and other weeds of concern from fields.

CURING AND BARN MANAGEMENT

PRINCIPLE

Proper curing and barn management including monitoring the curing atmosphere, is critical for maximizing both yield and quality, impacting crop value. Inspecting and maintaining barns and structures allows for safe and efficient labor housing the crop and the efficient use of fuel to cure the crop. Traceability provides transparency and integrity to your crop, operation, and brand in the market and an added reassurance to purchasers.

CRITICAL STANDARDS

- AIR and FIRE ONLY: Record the date that tobacco was placed in the curing structure and the date it was removed.
- FLUE ONLY: Have barn tested every 3 years and use only indirect fired barns with heat exchangers.
- Have a documented safety program for air cured and fire-cured barns that includes inspection of tier rails and support beams for soundness, inspection of general barn soundness, removal of stored machinery, lumber and other items from barn floors that could enhance injury in falls. Ladders or steps should be installed and maintained to reach tiers.¹

ADDITIONAL STANDARDS

High

- Have a documented program that allows for traceability of tobacco through curing and delivery.

Medium

- Maintain records of the type and number of curing structures or barns.
- Keep records of harvesting dates by field/tract.
- Maintain documentation on the curing structure or barn used for tobacco from each field and tract for traceability purposes.
- FIRE ONLY: Maintain records of firing procedures in fire cured barns to include the number of firings and fuel used (i.e. slabs, sawdust, etc.)
- FLUE ONLY: Use some method or tool to monitor temperature and humidity in the barn.² This includes a wet-bulb and a dry-bulb thermometer.

Low

- AIR AND FIRE ONLY: No curing structures more than two tiers high, barns designed such that no worker is more than 12 feet above the barn floor in normal hanging operations.
- AIR AND FIRE ONLY: Maintain records of spacing of sticks in curing barns and/or structures.
- FLUE ONLY: Use automated curing controls to measure temperature and humidity.
- FIRE ONLY: Monitor temperature in fire cured barns during firing.

¹ See Barn Inspection template in GAPC Records (www.gapconnections.com)

² See Example on page 27 in Appendix 2.

NON-TOBACCO RELATED MATERIAL (NTRM)

PRINCIPLE

Providing a product that is free of NTRM is critical in producing a quality crop at time of delivery. By eliminating sources of NTRM or physically removing NTRM operations are increasing crop value.

GUIDANCE

Market preparations (market prep) is defined as all preparations of tobacco for delivery and sale. This includes all activities surrounding stripping and baling tobacco.

ADDITIONAL STANDARDS

High

- Have at least one trash can in market prep areas. If market prep area is not currently in use, the trash cans that will be used should be visible.
- Do not use brooms with synthetic bristles in market preparation area.
- Regularly inspect market prep area and remove Non-Tobacco Related Materials (NTRM), keeping records of weekly inspection dates when market preparation areas in in use. If market prep area is not currently in use, a documented inspection program including an inspection checklist and log of dates needs to be available or last year's inspection log.

Medium

- Have designated break areas away from market prep area.
- Do not have tools with plastic handles in market prep area.

Low

- FLUE-CURED: Use picking lines to reduce NTRM.
- FLUE-CURED: Use sand reels/leaf tumblers to reduce NTRM.
- AIR AND FIRE ONLY: Use a slotted stripping table with wire mesh cover or other stripping systems that permits dirt and other NTRM to freely fall out of the tobacco as it is stripped (stripping chains, stripping wheels, etc.)
- Have a dedicated market prep and baling area with concrete, wood, or asphalt floor.

ON-FARM TOBACCO STORAGE

PRINCIPLE

On-farm storage is often necessary to hold tobacco from the time it has completed curing through market preparation until it is ready to be delivered. Proper tobacco leaf conditions help to avoid deterioration in quality and loss of yield.

CRITICAL STANDARDS

- Maintain a clean, dry tobacco storage area, with no preservative treated wood in contact with tobacco, no storage of pesticides, petroleum products, paint, stains, fertilizers or Styrofoam trays in storage area or other sources that could contaminate the tobacco in storage area.
- AIR AND FIRE ONLY: Ensure that livestock are excluded from curing and storage structures. If curing and storage structures are multi-tier there must be a permanent floor to separate livestock from tobacco to prevent contamination.

ADDITIONAL STANDARDS

High

- Store baled tobacco on concrete floor, untreated wood, trailers, wagons, or truck beds.

Medium

- Have an enclosed storage area with doors and windows that can be secured, if windows present. Doors and windows can be closed.

HOW YOU GROW MATTERS: ENVIRONMENTAL MANAGEMENT

AGROCHEMICAL MANAGEMENT

PRINCIPLE

Growers shall manage agrochemical applications using legal, safe, and environmentally friendly practices.

Growers shall implement proper handling, controlled storage and proper disposal techniques of all agrochemicals and agrochemical containers used on tobacco production.

CRITICAL STANDARDS

- Maintain SDS sheets for all Crop Protection Agents (CPAs) used in tobacco production.
- Maintain copies of labels for all CPAs currently being used in tobacco production either on the container in storage, or in farm files. Does not include CPAs that are no longer in use and are not on the farm.
- Have a designated, enclosed, dry (weather protected) and lockable CPA storage area with proper signage. Signage should signify “Danger”, “Pesticide Storage”, or “Keep Out” at a minimum, be able to withstand normal wear and tear and if exposed to outdoor conditions, be able to withstand weather. If no storage area a grower must show CPA purchase receipts, receipts from a custom applicator, or organic certification.
- Ensure that CPAs are stored in original manufacturer's containers with labels attached or on file in CPA storage room. If there is no storage area a grower must show CPA purchase receipts, receipts from a custom applicator, or organic certification.
- Dispose of empty CPA containers by triple-rinsing and punching or removing lid AND either recycling through programs or sites designated for CPA container recycling OR disposing of them in appropriate landfill. CPA containers cannot be burned.
- Properly segregate, store, recycle, or dispose of hazardous waste including but not limited to residual CPAs, fuel, oil, grease, paint, and batteries.

ADDITIONAL STANDARDS

Medium

- CPA storage with impermeable floor. This includes tubs, bins, or containers used to hold CPAs made of impermeable material.
- CPA storage designed to retain runoff from spills and leakages. This includes tubs, bins, or containers used to hold CPAs made of impermeable material that can hold more than the volume of CPA being stored.
- Mix or transfer CPAs in containment areas away from runoff channels.
- Ensure that greenhouse float water is properly and legally disposed of.

Low

- Maintain a current inventory of CPAs in storage and update monthly if changes occurred within the month.
- Have a designated, fenced or otherwise lockable storage area for empty CPA containers that have not been tripled rinsed and punched pending disposal.

- Properly dispose of non-hazardous waste products (i.e., wastepaper, cardboard, plastic (other than CPA containers)) by moving to a trash receptacle or recycle container. Burning non-hazardous waste is not acceptable.

SOIL AND WATER MANAGEMENT

PRINCIPLE

Soils are a dynamic, living, and fragile resource while water is a limited resource. Growers shall manage both to conserve, protect, preserve, and improve.

CRITICAL STANDARDS

- As required by law, maintain a conservation management plan approved by the soil and water conservation district for fields that are considered highly erodible land.

ADDITIONAL STANDARDS

High

- Use vegetated buffers between field and streams or lakes (minimum buffer distance is 33 feet).

Medium

- Keep records of dates and amounts of irrigation water and maintain records of rainfall amounts during the growing season.
- Use cover crop or fall seeded crop following tobacco harvest.
- Use crops planted with conservation tillage practices or sod as rotation crops on highly erodible land if applicable.

Low

- If you use irrigation, then use proper irrigation management methods, which include:
 - Maintain equipment and piping to prevent leakage
 - Maintain runoff water
- In a single field do not plant tobacco annually. Instead, use a rotation of no more than two years of tobacco followed by at least two years in other non-solanaceae crops (Solanaceae crops include tomatoes, eggplant, and peppers).
- Use conservation tillage practices in tobacco production (i.e. minimum or reduced tillage, strip tillage, no tillage).
- Use crops planted with conservation tillage practices or sod as rotation crops on all land (carbon sequestration by increasing soil organic matter).
- Maintain field borders/buffer strips along lower edges of fields and beside field ditches and drainage ways (minimum buffer distance is 33 feet).