GAP CONNECTIONS

GAP Connections Members

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JTI Leaf Services (US), LLC
Lancaster Leaf
Philip Morris USA
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GROWER MEMBERS

Over 11,000 members in 19 states

In Partnership with:

Clemson University
North Carolina State University
The Ohio State University
Penn State University
Purdue University
University of Georgia
University of Kentucky
University of Maryland
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University of Tennessee
Virginia Tech University
U. S. Department of Labor,
Wage and Hour Division

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GAP Connections develops, maintains, and provides leadership for agricultural practices which promote production that is competitive, sustainable, fair, compliant, and responsive to changing industry conditions and stakeholder needs.

The practices outlined in the U.S. Tobacco GAP Program represent an industry-wide effort that aims at ensuring economically, environmentally, and socially sustainable production of useable tobacco. The U.S. Tobacco GAP Program does not replace or supersede contract requirements between growers and purchasing companies but instead offers the industry a set of guiding principles that identify and promote best practices for on-farm production and post-production processes which produce a quality crop while protecting, sustaining or enhancing the environment with regard to soil, water, air, animal and plant life as well as protecting and ensuring the rights of farm laborers.

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I. VARIETY INTEGRITY AND SELECTION

Tobacco variety integrity is a quality assurance step that requires that the seed used is the correct type for the growing region, was certified by an approving governing body, and has a lot number for traceability should issues arise. Variety selection is the foundation for a successful crop from an agronomic, environmental, quality and economic perspective.

Good Agricultural Practices

- Variety selection should be based on the following criteria:
  - Disease resistance
  - Curing characteristics and cured leaf quality
  - Yield
  - Holding ability
- Review actual on-farm variety performance records and Extension information such as the "University Tobacco Production Guides" at the start of each season. Your local Extension Agent is also available to help in variety selection.
- Identify and test new varieties which show potential to improve your farm's overall performance.
- Use only certified seed and LC varieties for dark and burley tobacco. Plant only varieties approved by your contracting company.
- Avoid planting varieties with high resistance to black shank race 0 and little or no resistance to race 1 in the same fields consecutively over a period of years.

Documentation

- Document:
  - Varieties planted
  - Seed lot numbers
  - Seedling sources -- whether you purchase plants or grow your own plants, all varieties and seed lot numbers should be documented
  - If applicable, verification of screened seed or LC varieties
  - Seeding dates
- Document sources of variety information (seed company literature, university production guides, buying company recommendations, etc.).

Inspection List

- Are seed or seedling sources documented?
- Are seed lot numbers and variety names recorded?
- Are transplant seeding dates recorded with their respective varieties?
- Are published sources used to select varieties?
- If applicable, did the grower use screened and low converter (LC) seed?

Integrated Pest Management (IPM) is a coordinated approach to crop management that uses as many suitable and compatible methods (cultural, biological, and chemical) as possible so that pest populations do not exceed economic thresholds and, therefore, avoids unacceptable crop losses and environmental damage.

IPM does not necessarily mean completely eliminating agrochemicals, but rather their judicious use as a defense against pests and diseases whose population cannot be maintained at acceptable levels using other alternatives.
Where agrochemicals have to be applied they should be used safely and in accordance with all State and Federal laws and regulations.

Good Agricultural Practices

IPM Fundamentals:

- Select varieties resistant to common diseases, nematodes, and other pests when available and appropriate to your field histories.
- Use a rotation of tobacco with other crops that effectively reduces pest pressure as appropriate for your field history. Follow local Extension recommendations in designing an appropriate rotation.
- Top and manage suckers in a timely fashion.
- Observe likely future tobacco fields for possible disease and weed problems, and review field records from previous years in tobacco prior to tobacco planting.
- Collect soil and root samples for nematode identification and population determination to determine management practices in areas where nematodes have been identified as a problem.
- Use disease and pest free seedlings that are uniform and healthy.

- Transplant the crop within the recommended time period for your area.
- Avoid possible transfer of infection from tobacco products, waste tobacco materials, or infected soil by maintaining strict hygiene in the seedling production area and during the early stages of field crop production.
- Use alternative crop protection practices that minimize the use of synthetic pesticides such as promoting the proliferation of natural pest predators and destroying alternative host plants.
- Clean or sanitize equipment used in the production of seedlings and the crop regularly.
- Destroy unused transplants, tobacco field crop residues, and all waste tobacco materials (such as scrap) as soon as possible after their respective productive cycles are completed.

IPM Control Fundamentals:

- Monitor or scout frequently and systematically for infestation by pests.
- Identify the problem: pest, disease, or weed species.
- Understand pest life cycle, habits, damage caused to tobacco, and natural predators.
- Know economic threshold levels for pests with established thresholds and treat if pests reach this level.

IPM Chemical and Biological Fundamentals:

- Properly match pesticide to pest and time treatments to match the pest's most vulnerable life stage.
- Use only those agrochemicals and biological agents registered and approved for the particular tobacco type and specific pest problem, strictly following label instructions and complying with all regulations and guidelines.

- Apply pesticides at the right time of day and with the proper equipment for most effective control.
- Ensure adequate spray coverage.
- Select the appropriate rate of a pesticide for target pest(s).
- Rotate pesticide mode of action if multiple pesticide applications are necessary and use a variety of alternative practices to avoid the development of pests and pathogen resistance to crop protection agents or other control practices.
- Use natural crop protection agents such as biological control agents and plant extracts or other low toxicity products when they are economical, registered for use on tobacco and proven effective against the target pest.

Documentation

- Document:
  - field scouting dates
  - pests identified during scouting, and the level of infestation
  - crop protection agent applications made by field and date
  - follow-up assessment of pest control practices
- Maintain accurate field/tract records including the cropping history, pests, diseases, and weeds for at least the previous two growing seasons
- Document sources of pest control information

Inspection List

- Does the grower have scouting records indicating an established scouting program?
- Are pest problems (diseases, insects, weeds, etc) identified and recorded by field/tract?
- Are the levels of infestation recorded?
- Are records maintained that include cultural pest control practices and chemical controls, application date, rates by field/tract locations?
- Does the grower use appropriate information to determine best pest management practices?

III. NUTRIENT MANAGEMENT

Nutrient management is the practice of applying plant nutrients in the appropriate amount for the most profitable level of production while minimizing negative environmental impacts.

Good Agricultural Practices

- Review Extension Service publications for specific tobacco fertilization recommendations such as the “University Tobacco Production Guides.” Your local Extension Agent is also available to help with fertilization requirements.
- Maintain adequate soil fertility over time.
- Fertilization should be based on:
  - soil type
  - crop rotation (previous planted crop)
  - requirements as determined by a soil test that is no more than three years old
  - contract requirements
- Confirm fertilizers are appropriate for use with tobacco and applied using recommended or required application rates, timing and methods.
- Follow recommendations for the use of organic materials and animal manure. Take into account nutrients from organic sources when setting rates for inorganic sources of fertilization.
- If required by state or watershed regulations, implement a Nutrient Management Plan though your local Soil and Water Conservation District, the Natural Resource Conservation Service, or applicable organization in your area.

Documentation

- Keep field/tract specific records of:
  - soil test results that are no more than three years old at the applications are made,
  - soil type, and
  - specific nutrient(s) and/or lime applied and dates and rates of application (for all pre-plant, side dress, and foliar applications).
- To help determine if nutrient availability has been affected due to leaching keep records of:
  - rainfall received at each farm location per weather event and
  - if applicable, amount of water applied with irrigation per field/tract.
- Recommended observations and records:
  - Other weather conditions that may have affected nutrient availability
  - Performance of applied nutrient by field/tract
  - Agricultural practices which may impact nutrient management for tobacco fields in the future (i.e., crop rotations, fertilizer applications to other crops, cover crops , etc.)

Inspection List

- Does the producer have soil tests no more than three years old at the beginning of the field season on all tobacco fields/tracts?
- Are nutrient management practices consistent with soil test and University and contracting company guidelines?
- Is tobacco treated with fertilizers appropriate for use with tobacco and applied in accordance with the recommended application rates and methods?
- Are records of specific applications that include fertilizer analysis, application date, and rates kept by field/tract?
- Are rainfall and irrigation amounts recorded?

IV. CROP AND OPERATION MANAGEMENT

Good Agricultural Practices

- If required by your contract, complete FSA Form 578 Crop Report each year.
- Ensure surfaces used for market preparation, baling, storing or hauling tobacco do not have materials that have been treated with or have spillage of petroleum-based preservatives or fluids or pesticides.
- Keep tobacco types (burley, dark, Maryland, cigar, flue-cured, etc.) strictly separated from each other during seeding, curing, and market preparation operations.
- Manage the tobacco crop with a focus on improving agrobiodiversity. This means consider growing practices that will improve the ecosystem in regard to protection of different species of mammals, birds, bacteria, plants and fungi.
- Strictly follow crop identity preservation practices (e.g., the selection of genetically modified GM crop fields) to prevent commercial tobacco crops from mingling with other GM crops.
- Develop an awareness of climate change issues; e.g., carbon dioxide, impact of CPA usage and fertilizer.

Seedling Production:

- Manage tobacco plant production greenhouses in an environmentally responsible manner and grow healthy, vigorous, uniform plants.
- Prohibit smoking or the use of tobacco products in the greenhouse to reduce the risk of spreading of tobacco mosaic virus.

In the Field:

- Transplant and top the tobacco at the appropriate time and harvest it at the correct stage of maturity to be consistent with contract requirements to achieve desired product quality while maintaining yield.
- Follow the terms of your contract with regard to specific leaf number or plant spacing requirements or recommendations related to the particular tobacco type.

Curing, Market Preparation and Storage:

- Separate tobacco by stalk position and quality to meet contract requirements.
- Ensure the moisture levels and bale weight are within contract specifications.
- Ensure marketing packages are uniform and meet all contractual requirements.

Tobacco Transportation from Farm to Market:

- All tobacco should be covered and secured to ensure protection from inclement weather. Avoid use of plastic covers.
- Ensure all transportation surfaces are free from contaminants (e.g. oils, greases, animal residues, agrochemicals)

Documentation

- Keep records of:
  - plant population
  - planting, topping, and harvesting dates
  - worker training on grade/stalk separation
  - worker training on moisture and weight requirements

Inspection List

- Is tobacco planted within the required dates if stated in your contract?
- Are records kept of plant population (or row width and plant spacing)? Does tobacco planted meet the plant population density requirements (if stated in your contract)?
- Are dates of key production practices recorded by field?
- Are workers trained on grade/stalk position separation (posters, videos, CDS, GAP handbook)?
- Are workers trained on moisture and weight requirements?

V. CURING AND BARN MANAGEMENT

Proper curing and barn management is critical for maximizing both yield and quality and, therefore, crop value. Curing tobacco is the culmination of all previous steps taken to produce and maintain the crop. Quality can decline with improper curing, or be maintained and realized when curing is performed correctly.

Good Agricultural Practices

- Select sites and designs for curing barns that will allow the most efficient operation.
- Balance barn capacity with its capability to cure efficiently and cure in ways that optimize output while maintaining the desired cured leaf quality.
- Ensure that the curing structures are safe and well designed for workers and protect the tobacco.
- Exclude livestock from curing barns/structures

Flue-cured Tobacco Operations:

- Use only indirect fired systems to prevent the tobacco from being exposed to combustion gases.
- Inspect the overall condition of the barn prior to curing including exposed insulation, heat exchangers and equipment in curing barns for leaks that could result in exposure to combustion gases.

- Barns must be tested every three years for C02 (carbon dioxide) emissions that indicate possible leaks in the barn heating system.
- Use hygrometers, a wet-bulb or other temperature and humidity sensors to either automatically or manually control barn ventilation to optimize leaf quality.
- Conserve fuel by employing the most energy efficient curing structures and management systems to cure tobacco in the most efficient manner.
- Consider selecting fuel supply systems that use renewable energy sources when technology advances make them economically feasible and environmentally positive.

Air-cured Operations:

- Check that adequate ventilation is provided during the curing process and that the tobacco is spaced properly for good air movement to prevent "house burn."
- Burley growers should use the Burley Curing Advisory website to get the latest weather and climatic forecasts to help you manage your burley curing program in locations where available (most of Kentucky and counties that border Kentucky in adjoining states).

Documentation

- Document:
  - the type and number of curing structures/barns
  - the curing structure/barn used for each field's/tract's harvested tobacco
  - the date tobacco was put in curing structure and the date it was taken out of the curing structure
- Air-cured and fire-cured operations need to document the spacing of sticks in curing structures.
- Fire-cured operations need to document the number of firings used to cure each field/tract.
- Flue-cured operations need to maintain proof of a "passing" barn test for C02 emissions and faulty or cracked heat exchangers that is no more than three years old.
- Flue-cured operations need to maintain records of fuel used in curing for calculation of pounds cured per gallon of fuel

Inspection List

- Are air cured and fire cured barns well designed to be safe for workers and allow adequate ventilation and efficient operation?
- In air cured structures, is tobacco adequately protected from adverse weather?
- Flue-cured Operations:
  - Verification of barn test no more than three years old.
  - Presence of instrumentation for monitoring temperature and humidity in each barn.

VI. NON-TOBACCO RELATED MATERIALS (NTRM)

NTRM or foreign matter is a broad term that refers to all materials that are not tobacco lamina and stem. This includes, but is not limited to: soil particles, paper, string, metal fragments, tobacco stalks and suckers, plastics, foam materials, wood, grasses, weeds, oils and burlap fibers, as well as gloves and other personal protection equipment. Providing a product that is free of all forms of NTRM is a critical aspect of GAP that begins at the farm level with elimination of NTRM sources and physical removal of all NTRM materials during on-farm tobacco handling, storage and transport.

Good Agricultural Practices

- Provide training and increase awareness on NTRM issues and the importance of clean tobacco throughout production and marketing preparation.
- Develop a proactive program (see details below) to eliminate and avoid any tobacco contamination and insect infestation sources on the farm: before the growing season begins, during growing, harvesting, curing, market preparation, and transportation.

- Ensure that all facilities including green and cured leaf working areas, machinery and equipment are routinely inspected for possible NTRM contamination.
- Follow recommended crop management practices to control weeds and grasses in the field, which can be a source of NTRM.
- Monitor and inspect farmer facilities and bales for NTRM throughout the production and marketing cycle.
- Ensure that all the tools used in the market preparation area are in good condition and have handles made of wood or metal.
- Confirm elimination of NTRM sources and physical removal of all NTRM materials through regular visual inspections.
- Provide trash cans in market preparation areas that are secured i.e. not easily tipped over.
- Provide and enforce the use of designated break areas for workers in market preparation areas.
- A farm-level proactive NTRM program to eliminate and avoid any tobacco contamination and insect infestation sources on the farm often includes:
  - focusing upon the individual stages of the production cycle (e.g., greenhouse seedling production area, field, harvesting, curing, grading, baling, etc.),
  - identifying specific items to be inspected for each stage of production and for all tobacco handling areas, facilities, equipment, and storages,
  - maintaining general farm sanitation and cleanliness, and
  - reviewing materials and products used in tobacco production, handling, curing, and storage that could be potential NTRM.

Prevention of Weed Seed Contamination

Contamination of cured and baled tobacco with seed of herbicide resistant pigweed and/or other problem weeds has become an important issue in some export markets. This is largely a flue cured issue but can be a problem in all tobacco types. All reasonable efforts should be made to prevent weeds from forming seed in the field prior to harvest.

Best practices include:

- Choose the most effective herbicide for control of the problem weeds.
- Use timely cultivation and hand weeding to supplement herbicides.
- Control weeds in field borders where harvesters will be turning.
- Scout fields before harvest and clean out escaped weeds.
- Control weeds after harvest by tillage or chemicals until a cover crop is established.

Documentation

- Keep records of worker training on NTRM prevention, including
  - topics covered,
  - dates conducted, and
  - number of workers who attended.
- Keep records of inspection dates for all facilities, machinery and equipment for NTRM contamination.
- Keep records of practices for preventing weed seed contamination.

Inspection List

- Has a program to eliminate NTRM (suckers, stalks, grass, weeds, etc) been developed?
- Are problem weed control practices documented?
- Are there designated break areas?
- Are there trash cans?
- Are tools and equipment in market preparation areas in good condition and constructed with metal or wooden handles?
- Are stripping facilities cleaned on a regular schedule?

Recommended but not required:

- For flue cured operations:
  - Does the grower have picking lines?
  - Does the grower have sand reels?
- For air cured and fire cured operations using stripping tables:
  - Does the grower have a slotted stripping table which allows dirt to fall out of the stripped tobacco?
  - Does the grower have wire mesh on the stripping table?

VII. ON-FARM TOBACCO STORAGE

On-farm storage is often necessary to hold cured tobacco until it is ready to be marketed. Correct tobacco leaf conditions are required to avoid deterioration in quality and loss of yield. On-farm storage should provide safe and secure storage conditions.

Good Agricultural Practices

- Tobacco for storage should be:
  - stored at the correct moisture and density,
  - free from any non-tobacco related materials (NTRM), contamination, or infestation,
  - regularly inspected for moisture content, heating, molding, fermentation, infestation, and deterioration in quality, and
  - free of any agrochemical product applied post harvest
- All tobacco storage facilities, structures, and/or areas should have good site hygiene and sanitation.
- Tobacco in the storage area should be protected from rainfall and other sources of excess moisture.
- Tobacco should be stored in an area free of agrochemicals, seed, or other products (including empty agrochemical containers) that could contaminate the tobacco.
- Do not use chemical and fumigation controls, including rodenticides, for on-farm storage.
- When storage facilities, structures, and/or areas are being used to store tobacco they should be:
  - clean, dry and properly ventilated,
  - free of NTRM and all tobacco scrap and byproducts,
  - if applicable, constructed of appropriate material that has not been treated or contaminated by chemicals that could transfer to tobacco, and
  - monitored and inspected for leaks, damage, and insect and pest infestation.
- If the storage facility used to store tobacco has:
  - a door it should be tight fitting and securable.
  - windows and/or other openings they should be equipped with screen-wire or other materials to prevent insect and pest infestation.
  - lighting fixtures they all should be covered with shatterproof shields
- Livestock should be excluded from storage areas

Documentation

- List all facilities and areas used for tobacco storage.

Inspection List

- Is the baled tobacco stored at the correct moisture and density?
- Are the storage facilities and/or storage areas:
  - adequate to protect the stored tobacco from adverse weather?
  - clean, dry, and properly ventilated?
  - equipped with tight fitting and securable doors?
  - have windows/openings that are sealable and equipped with screen-wire or other materials to prevent insect and pest infestation?
  - constructed of appropriate material that has not been treated or contaminated by chemicals that could transfer to tobacco?
  - being used for storing agrochemicals, petroleum products, fertilizer, or any other product that could potentially contaminate the tobacco?
  - free from NTRM and all tobacco scrap and byproducts?
- Are livestock excluded from the storage facility/area?

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 agrochecmical 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 priniciples, 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?

Labor Management

I. Laws and Regulations

Compliance with all federal and state labor laws is an essential component of GAP. Labor laws continue to change and it is important to stay up to date with all laws affecting farming operations. Some of the labor laws and regulations that must be adhered to include, but are not limited to:

- Federal Fair Labor Standards Act (FLSA). Basic provisions of this law for all labor include:
  - Minimum Wage
  - Child Labor
- Migrant and Seasonal Agricultural Worker Protection Act (MSPA). Basic provisions of this law for migrant and seasonal labor include:
  - Wages
  - Housing
  - Transportation
  - Disclosures
  - Recordkeeping
  - Farm Labor Contractor (FLC) Registration
- Applicable immigration laws could include: The Immigration and Nationality Act (INA), The Immigration and Reform Act of 1986 (IRCA), The Immigration Act of 1990, The Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) of 1996, and The Homeland Security Act of 2002. Basic provisions of these laws include:
  - Laws, regulations, and requirements pertaining to H-2A Employment
  - Employer Sanctions
  - Discrimination
- Occupational Safety and Health Act (OSHA). Basic provisions of this state and federal law include:
  - Workplace Safety
  - Field Sanitation Standards
- EPA Agricultural Worker Protection Standard
- Workers' Compensation Requirements (by State)
- The Patient Protection and Affordable Care Act
  - May apply to large growers who employ more than 50 workers for more than 4 months out of the year
  - Provisions include requirements to provide employee health insurance
  - NOTE: The rules for determining applicability of this act are very complicated. The great majority of farmers should not be affected, but larger growers may be. H2A workers IN GENERAL are not required to be provided insurance, but the hours they work count toward determining whether full time workers on the same farm may be covered.

Some of the laws referenced above have exemptions for small farms. The exemptions are based on the amount of labor hired in a given time period. Information about exemptions is available from DOL and OSHA.

Good Agricultural Practices

- Determine your labor requirements and source of your labor (family, local, migrant, etc.).
- Determine and comply with all applicable state and federal laws and regulations.
- Ensure that wages of all workers (including for temporary, piece rates, seasonal, and migrant workers) meet, at a minimum, national and state minimum wage requirements or adverse effect wage if H2A workers
- Ensure fair treatment of all workers.
- All farm labor must be voluntary.
- Provide a safe work environment to prevent accidents and injury and to minimize health risks.

- Recognize and respect workers' rights to freedom of association to join a union.
- All documents related to employment such as passports, ID etc. should remain in possession of the workers, unless the worker requests that grower store them for safe keeping. In this case they should be readily available to the worker upon request. The grower should have a signed statement from the worker authorizing the grower to keep the documents.
- Workers are free to leave employment at any time and free to leave and return to the place of work or housing in off work hours

Employment Eligibility Verification Form (I-9):

- Complete and maintain a Form I-9 for each employee.
  www.uscis.gov/files/form/i-9.pdf
- Form I-9's must be kept for as long as the individual works for the employer. Once the individual's employment has terminated, the employer must retain the Form I-9 either three years after the date of hire, or one year after the date employment is terminated, whichever is longer.

Posters:

- Post all legally required labor standards posters where they will be visible to all employees.
- The following website can be used to enter your farm's labor situation and it then will identify exactly what signs are required to satisfy federal requirements. There is also a link to your state's sites to determine if any additional signs are needed.
  www.dol.gov/compliance/topics/posters.htm

Farm Labor Contractor:

- Definition: A Farm Labor Contractor (FLC) is someone who, for money or other valuable consideration, recruits, solicits, hires, employs, furnishes or transports migrant and/or seasonal agricultural workers or, provides housing to migrant agricultural workers. They are often called crew leaders or crew bosses. Anyone in the US who meets this definition must be registered with the US Department of Labor. **When using an FLC, be aware that you may be considered to be a joint employer. Use of an FLC does not free growers from responsibility for labor practices on their farm!!!!**

Best Practices in FLC Use:

- Ensure that the Farm Labor Contractor is registered with the U.S. Department of Labor.
  - Helpful facts –www.dol.gov/whd/regs/compliance/whdfs49.htm
- Obtain a copy of the contractor's Certificate of Registration and keep it in your files.
- Ensure that workers are properly paid by either:
  - Paying workers directly rather than through an FLC, or
  - Insisting that the FLC provide wage statements to workers, and provide you with copies.
- Be sure that all workers provided by the FLC are of legal age to do the work they are hired for.
- Ensure that workers employed through an FLC have their full rights, including the freedom to leave their job at any time, the right of free association and access to all their documents and legal papers.
- Be especially alert to any indication that workers are being forced to work involuntarily.

Disclosures:

- When offering employment, provide a written statement that describes the terms and conditions of their employment.
- The written statement must be written in the worker's language and must include:
    - place of employment (with specifics, such as the name and address of the employer or the association),
    - wage rates (including piece rates) to be paid,
    - crops and kinds of activities for which the worker may be employed,
    - period of employment,
    - transportation, housing, and any other employee benefits to be provided, if any, and any costs to be charged for each, and
    - whether state workers' compensation or state unemployment insurance is provided.
- Provide workers with written wage statements that include total pay, hours worked, daily start/stop times, piece rate and units produced if applicable, and any deductions from pay. (**NOTE:** If subject to MSPA, H2A or FSLA, a more detailed statement may be required)
- If workers are employed through an FLC, these disclosures should still be provided either by the FLC or the grower, and it is the grower's responsibility to see that this is done.

Housing:

- If migrant labor housing is provided:
    - Ensure that the facility complies with all federal and state safety and health standards.
    - Perform regular self-inspection throughout the season to identify items needing maintenance.
    - Post or present to each worker a statement of the terms and conditions of occupancy which must include:
        - name and address of the farm labor contractor, agricultural employer, or agricultural association providing the housing,
        - name and address of the individual in charge of the housing,
        - mailing address and phone number where persons living in the housing facility may be reached,
        - who may live at the housing facility,
        - charges to be made for housing,
        - meals to be provided and the charges to be made for them,
        - charges for utilities, and
        - any other charges or conditions of occupancy.
- Have all housing inspected by the appropriate governmental agencies if required by law.. Where not required by law, growers should inspect housing themselves prior to occupancy and at intervals during the season, using the Housing Safety and Health Checklist provided in the General Records.

Transportation:

- Vehicles provided by growers or FLCs to transport workers should:
    - be mechanically sound and safe to operate.
    - have drivers with valid licenses.
    - be adequately insured.
    - be inspected by proper authorities when required by law, or be self inspected by growers or designated employees using the DOL inspection form provided in the records.

Child Labor:

- Workers younger than 16 years of age should not be employed to work in tobacco, with the exception of immediate family members.
- Some contracting companies have contractual requirements regarding child labor that are more stringent than overall GAP policy or than Federal or state laws. Follow all relevant contractual requirements regarding child labor.
- Comply with all federal and state child labor laws.
- Pesticide handlers are required by EPA Worker Protection Standards to be at least 18 years old.
- For a detailed review of the Federal laws governing the employment of minors (children under 18) in agriculture, please review the US Department of Labor's Child Labor Bulletin 102, available at: http://www.dol.gov/whd/regs/compliance/childlabor102.pdf.
- *Please note*: individual state laws may impose more stringent requirements than Federal child labor laws. Please make sure you are familiar with your state's child labor laws by contacting your state department of labor (contact information provided below).

Documentation

- I-9 forms for all employees including H-2A workers
- Number of full-time and seasonal family and non-family (migrant, H-2A) workers
- Copy of terms and conditions of employment
- Copy of terms and conditions of housing (if provided)
- Copy of an example wage statement, with personal information omitted
- If required by your contract, payroll records for each employee
- A copy of the Labor Contractor's Certificate of Registration with the DOL (If farm workers are hired through a Labor Contactor)
- Inspection forms for vehicles provided for transportation

Inspection List

- Does the grower keep wage payment records?
- Are workers informed of their legal rights and the conditions of their employment when they start working?
- Has the grower provided workers with a proper disclosure of the terms and conditions of their employment?
- If farm workers are hired through a Labor Contactor, has a copy of the Labor Contractor's Certificate of Registration with the DOL been retained?
- If minors are employed on the farm, is the necessary documentation required by federal and state laws maintained? See the USDOL's Child Labor Bulletin 102 available at: http://www.dol.gov/whd/regs/compliance/childlabor102.pdf for federal requirements.
- Are nonfamily members under the age of 16 employed in tobacco production?
- Are vehicles provided for transportation inspected at the beginning of the season?

II. Farm Labor Related Resources

US Department of Labor

- Migrant and Seasonal Agricultural Worker Protection Act:
  - www.dol.gov/compliance/laws/comp-msawpa.htm
  - www.dol.gov/whd/regs/compliance/posters/mspaensp.htm

- Migrant and Seasonal Agricultural Worker Protection Act:
  - www.dol.gov/compliance/laws/comp-msawpa.htm
  - www.dol.gov/whd/regs/compliance/posters/mspaensp.htm
- Immigration and Nationality Act
  - www.dol.gov/compliance/guide/aw.htm
- Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA)
  - www.uscis.gov/ilink/docView/PUBLAW/HTML/PUBLAW/0-0-0-10948.html
- The Homeland Security Act of 2002
  - www.dhs.gov/homeland-security-act-2002
- Occupational Safety and Health Act (OSHA) for agriculture
  - www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1928
- Fair Labor Standards Act
  - www.dol.gov/dol/topic/youthlabor/agriculturalemployment.htm(youth farm labor)
  - https://www.dol.gov/whd/regs/compliance/posters/wh1386Agrcltr.pdf

Connecticut Department of Labor

- Phone: 860-263-6000
- Website: http://www.ctdol.state.ct.us/

Florida Division of Workers' Compensation

- Phone: 850-413-1609
- Website: www.myfloridacfo.com/wc/

Georgia Department of Labor

- Phone: 404-656-3017
- Website: www.dol.state.ga.us

Indiana Department of Labor

- Phone: 317-232-2655
- Website: http://www.in.gov/dol/

Kentucky Office of Employment and Training (Employer Services)

- Phone: 502-564-7456
- Website: : www.oet.ky.gov/employer/employer.htm

Kentucky Department of Labor

- Phone: 615-564-3070
- Website: www.labor.ky.gov/

Louisiana Workforce Commission

- Phone: 225-342-3111
- Website: www.laworks.net

Maryland Department of Labor, Licensing and Regulation

- Phone: 301-393-8218
- Website: www.dllr.state.md.us

Massachusetts Executive Office of Labor and Workforce Development

– Phone: 617-626-7122

– Website: www.mass.gov/lwd/

Missouri Department of Labor

– Phone: 573-751-3403

– Website: www.labor.mo.gov

North Carolina Department of Labor – Agricultural Safety and Health Bureau

– Phone: 800-625-2267

– Website: www.nclabor.com/ash/ash.htm

- Introduction to NC Migrant Housing Inspections (for North Carolina growers):

– Website: www.nclabor.com/ash/ash_blue_book.pdf

Ohio Department of Commerce, Division of Industrial Compliance and Labor

– Phone: 614-644-2223

– Website: www.com.ohio.gov/dico/Default.aspx

Pennsylvania Department of Labor and Industry

– Phone: 800-932-0665

– Website: www.dli.state.pa.us

South Carolina Department of Labor — Office of Immigrant Worker Compliance

– Phone: 803-896-2606

– General Phone: 803-896-4300

– Website: www.llr.state.sc.us/immigration

Tennessee Department of Labor and Workplace Enforcement

– Phone: 615-741-6642

– Website: www.tn.gov/labor-wfd/laborlaws.html

Virginia Department of Labor

– Phone: 804-371-2327

– Website: www.doli.virginia.gov

West Virginia Division of Labor

– Phone: 304-558-7890

– Website: www.wvlabor.com

Wisconsin Department of Workforce Development

– Phone: 608-267-5123

– Website: dwd.wisconsin.gov

I-9 Forms

– Website: www.uscis.gov/files/form/i-9.pdf

III. Farm Safety and Worker Training

Provide on-going training and education in all elements of GAP to ensure that everyone involved in the tobacco production understands the importance of working in a safe manner. Discuss with farm workers the hazards and risks associated with agrochemicals, safe working practices, emergency response and health surveillance.

Good Agricultural Practices

- Provide a safe work environment to prevent accidents and injury and to minimize health risks.
- Comply with Occupational Safety and Health Act (OSHA) if applicable to your farm.
- Keep records of all work related accidents and illnesses serious enough to interfere with workers ability to preform their job and/or requiring more than simple first aid treatment.
- Review accident reports from past seasons for guidance in avoiding future problems.
- Maintain equipment in good operating condition as per manual/guidance provided by manufacturer or dealer of equipment.
- Inspect all farm machinery for safety guards and replace as necessary.
- Provide clean drinking water for all workers at all times.
- Identify risks on the farm such as those involved in operating machinery/equipment, adverse weather conditions, agrochemical applications, etc. and train workers on how to avoid and protect themselves from such risks.
- Instruct or provide training to farm workers on the hazards and risks associated with agrochemicals, safe working practices, emergency response and health surveillance. Training provided should meet the requirements of the EPA Worker Protection Standard.
- Have fire extinguishers available within two hundred feet of curing barns and market preparation facilities when workers are present.

Green Tobacco Sickness:

- Avoid working with wet tobacco.
- If workers must work with wet tobacco, provide them water resistant gloves and body covering.
- If workers' clothes get wet from tobacco leaves, they should change into dry clothes.
- Workers should wash hands often.
- Recognize symptoms of GTS, including:
  - Headache
  - Dizziness
  - Nausea
  - Vomiting
  - Weakness
  - Insomnia
  - Loss of appetite
- Seek medical attention when symptoms occur.

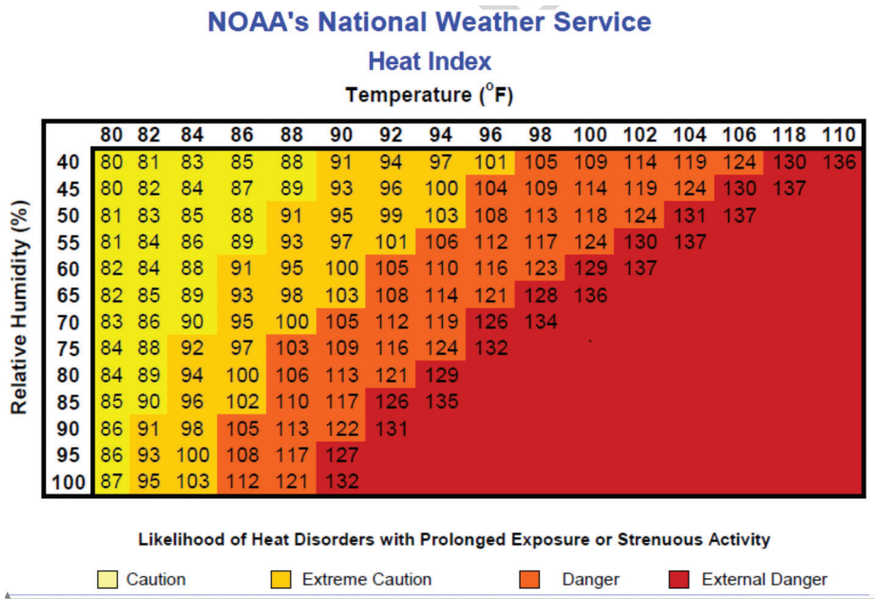
Heat Stress

- Train workers how to recognize and prevent heat related illness.
- Check the expected heat index daily using local weather information.
- Take extra precautions such as longer breaks or shifting work hours away from the hottest time of day when the expected heat index is in the danger zone as shown in the chart below.

- Have drinking water available at all times and encourage workers to stay hydrated.

The attached heat index chart is from NOAA –

http://www.nws.noaa.gov/om/heat/images/heat-index12.gif



Links to OSHA NIOSH Recommended Practices for GTS, in English and Spanish (also includes information on heat stress prevention)

http://www2.osha.gov/Publications/OSHA3776.pdf

https://www.osha.gov/Publications/OSHA3765.pdf

Training

- Attend GAP training, University Extension meetings, etc.
- Develop a plan for worker training as listed in other sections of this GAP document including worker safety with emphasis on Personal Protective Equipment for agrochemicals and prevention of Green Tobacco Sickness.
  - Required training for workers should reflect their job responsibility
- Examples of worker training topics:
  - General Farm Safety
  - Farm Safety and Equipment Hazards
  - Personal Protective Equipment (PPE)
  - PPE for prevention against carbon monoxide poisoning in dark-fired tobacco barns
  - Baler and Tractor Safety
  - Green Tobacco Sickness (symptoms and treatments)
  - Heat Stress (symptoms and treatments)
  - Safety Shields and Guards on Equipment
- Worker Protection Standards (REI signs, PHI signs, safety equipment, such as gloves, eyewear, footwear, dust masks, hearing protection). Beginning in 2017,
  - workers receive WPS training every year.

  - records of training must be kept for at least two years.
  - training must be completed before the workers begin work at the beginning of the season.
- Training should be updated every year. If training can be documented from another location or farm in the same year, it does not need to be repeated on multiple farms.
- **Many useful materials for worker training can be found at**

  https://gapconnections-public.sharepoint.com/growers/resource-list

Documentation

Safety

- Records of work place safety program, including documentation of training.
- If migrant labor housing and/or vehicles are provided farm workers, records of the DOL certification and inspection of migrant labor housing and records of inspection of vehicles.
- Records of all accidents – nature and number of accidents, how they occurred, and corrective and preventive actions taken based on the review of past accidents. (If subject to OSHA regulation, Form 300 must be used for this and kept on file for 5 years, even if no accidents occur in a given year).

Training

- Records of worker training on:
  - general farm safety-topics
  - the proper storage, handling, application and disposal of tobacco agrochemicals
  - recognition of Restricted Entry Intervals for pesticide applications
  - use of PPE
  - prevention of carbon monoxide poisoning in dark-fired tobacco barns
  - GTS (symptoms and, treatments)
  - heat stress (symptoms and, treatments)
  - worker protection standards
  - safe operation of farm machinery
- Records of grower training on Industry GAP.
- Records of grower attendance of University Extension meetings.
- Records of pesticide applicator training.

Inspection List

- Does the grower have a documented work place safety program that includes documentation of training and records of accidents?
- Does grower have first-aid equipment available?
- If housing is provided, does the grower have up-to-date certification from DOL or other appropriate governmental agencies for migrant labor housing?
- Are precautions taken to limit work in wet tobacco and exposure to Green Tobacco Sickness (GTS)?
- Are gloves and water-resistant clothing available to all workers when working with wet tobacco?
- Are required posters displayed in a conspicuous place at the work site for farm workers to see?

- Does the grower instruct all equipment operators on the safe operation of farm field equipment? (Equipment manuals and/or documented procedures)
- Are other operationally required and appropriate PPE such as safety gloves, hearing protection, safety hats and/or helmets, safety footwear, dust masks available?
- Are fire extinguishers available in close proximity (within 200 feet) to barns and market preparation facilities when workers are present? NOTE: On farms subject to OSHA regulation requirements may be more strict.
- Does all farm field equipment used for tobacco have required guards or shields?
- If vehicle is provided to your farm workers, is it in good working order?
- Does the grower prohibit minor workers from doing work that is hazardous or likely to harm the minor's health or safety?
- Have farm workers been trained on use of PPE, GTS prevention and protocols? (Posters, videos, CDs, documented meetings and/or training brochures)
- Are workers that handle agrochemicals trained in the proper storage, handling, application and disposal of tobacco agrochemicals?
- Has the grower attended GAP training and University Extension meetings, and pesticide applicator training? (documented meetings)