Good Agricultural Practices (GAP) Guidelines

GUIDE No. 3 – February 2005

GOOD AGRICULTURAL PRACTICES

The concept of Good Agricultural Practice (GAP) aims at ensuring sustainable, economically viable production of usable tobacco and can be defined as: "Agricultural Practices which produce a quality crop while protecting, sustaining or enhancing the environment with regard to soil, water, air, animal and plant life."

Today, increasing attention is focused upon the impact farming practices are having on the environment and there is an increasing emphasis on more sustainable methods of crop production. Systems need to be adopted that are more sensitive to environmental issues, genetic diversity, wildlife and their habitats and in some cases the social structures of rural communities. Furthermore, consumers around the world are more sophisticated and critical than in the past, demanding to know how and what has been used to produce their agriculturally derived products.

The same is true for the tobacco industry and all the partners in the supply chain, from farmers, extension workers, leaf merchants, to manufacturers and other associated agricultural based industries, have an important part to play in carrying our industry forward. Progress has already been made in several areas to ensure that the tobacco crop not only supplies a raw material of the right quality at a competitive price but that it is produced in a responsible way which safeguards the environment, natural resources, and protects the well being of those who produce the crop. At the same time, GAP must ensure economic viability for the farmer and a safe working environment for those directly involved in the production of the crop. This is the concept of Good Agricultural Practice (GAP) - responsible crop production.

Because tobacco is grown in many different regions of the world, under various agricultural systems at different levels of sophistication, there is no one GAP template to suit all farm situations. There are guiding principles that should be considered by those involved in the production of tobacco. Varying definitions of GAP exist within the agricultural sector, and existing GAP programs among tobacco industry members' varies in the areas of focus and the manner in which adherence and improvement is gauged. Certain commonalities exist, as well as unique areas of focus. This document addresses both situations and outlines them below. The object of this document is to serve as a guide in the development or enhancement of a Good Agricultural Practices program. It is not the intent of this document neither to replace existing GAP programs nor to be used as an industry all-inclusive GAP program.

Key elements of GAP programs often include the following:

I. **Soil and Water Management**
II. **Variety Integrity / Selection**
III. **Crop Management**
IV. **Integrated Pest Management**
V. **Agrochemical Management**
VI. **Forestry**
VII. **Curing and Barn Management**
VIII. **On-Farm Tobacco Storage**
IX. **Non-Tobacco Related Material (NTRM) / Foreign Matter**
X. **Farmer Training**
XI. **Socio-Economic Issues**

Additional elements may be included in individual GAP programs. The terminology and grouping of the key elements often differ between organizations. Further in this document are expanded guiding principles and practices to support the abovementioned key elements. It is often found that many of the Good Agricultural Practices can be applied to several of the key elements.

I. SOIL AND WATER MANAGEMENT

Soil Management

The system adopted for tobacco growing should be the most appropriate for the specific situation. Soils and water should be managed carefully, considering their physical, chemical and biological characteristics. Each specific situation requires adapting soil and water management practices and conservation techniques as appropriate. Erosion control can greatly reduce the chances of surface and groundwater pollution as well as preserve soil quality and fertility. Therefore, soil and water management is key to efficient and environmentally sustainable tobacco production.




Guiding Principles and Practices

Soil should be regarded as a dynamic, living and fragile resource.

- Criteria for site selection should be established taking into consideration:
    - Soil type, depth and fertility
    - Slope
    - Cropping history
    - Drainage, etc.
- Growing tobacco in steeply sloping areas, unless terraced, should be avoided; these areas may be more suited to tree planting
- Contour planting and conservation practices and devices, such as terraces, strip planting, should be implemented, taking into consideration that they are fundamental practices which:
    - Act as barriers to runoff
    - Promote vertical infiltration of water and more efficient retention of soil
    - Reduce soil movement and erosion
- 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. Mulching, and no or minimum till systems should be implemented where feasible. Cover crops should be:
- Used in rotation, or jointly with tobacco and left on the surface, preferably without soil incorporation, with a view to achieving better soil protection against rain, wind, and direct sunshine
    - Preferably grasses or legumes
- Field burning to eliminate crop residue or ground cover is not recommended because it:
    - Results in loss of good soil structure,
    - Diminishes organic content, thus decreasing water retention and cation exchange capacity of the soil,
    - Causes air pollution.
- Soil nutrient status and fertilizer and lime requirements should be determined by routine soil analysis at least every 5 years and soil fertility should be maintained by:
    - Practicing acceptable rotations
    - Focusing on fertilizer management

- Focusing on cover crop management
- Implementing sound cultivation practices
- Applying the correct type and amount of nutrients required for the crop at the appropriate time

- Artificial fertilizers recommended for tobacco growing:
  - Are similar to those used for other crops. However, specific formulations may be available
  - Should be used to complement organic products

- The use of organic fertilizers and organic waste products should be encouraged provided that their origin and composition are known, particularly with regard to heavy metals and other contaminants

Water Management

Water is a limited resource and its maintenance is important in sustaining both plant and animal life and well-being.

- Safeguard water supplies by:
  - Not mixing or applying agrochemicals near open watercourses
  - Not allowing fertilizers or agrochemicals to enter water courses
  - Protecting irrigation water sources
  - Avoiding wastage of water

- Not allowing fertilized water from seedling float production and other sources to contaminate water supplies

- Minimize water pollution (by fertilizers, agrochemicals, fossil fuels, oil, etc.).

  Avoid:
  - Agricultural chemicals and fertilizers that may have a high potential for leaching
  - Over-application of agrochemicals and fertilizers
  - Irrigation back-flow

- Buffer areas should be maintained between farmland and environmentally sensitive areas. Strategically placed buffer strips in the agricultural landscape can effectively reduce movement of sediment, nutrients, and agrochemicals within and from the farm fields. Buffer strips should allow farmers to achieve a measure of economic and environmental sensitivity in their operations, enhancing wildlife habitat and protecting biodiversity

II. VARIETY INTEGRITY AND SELECTION

Variety forms the foundation for a successful crop from an agronomic, environmental, quality and economic perspective.

Guiding Principles and Practices

- Practices and procedures for varieties approval that test for their agronomic suitability and market acceptability should be established

- Both seed certification and seed production programs should maintain the genetic purity of tobacco varieties

- Only certified, registered or approved varieties with traceable provenance and with due compliance to plant breeders rights, variety protection and other Intellectual Property Rights should be grown

- Only certified, registered or recommended varieties with disease resistance profiles that match the local problems and are in line with market requirements should be grown

- Only conventionally bred and developed varieties should be grown for commercial channels

- Bio-safety and crop identity preservation practices should be strictly followed in order to prevent mingling with GM crops

III. CROP MANAGEMENT

Crop Management forms the framework of tobacco production and requires the implementation of acceptable agronomic and environmentally sound practices from planning to post harvest in order to achieve the production of the type and style of tobacco leaf desired.

Guiding Principles and Practices

- Seedlings should be:
    - Produced in a environmentally responsible system without the use of harmful fumigants such as methyl bromide
    - Produced from certified seed of registered, recommended varieties
    - Uniform
    - Healthy and vigorous
- Cultivation and land preparation should:
    - Cause the least possible environmental disturbance
    - Maintain soil fertility and structure
    - Include rotation, conserve the soil, enhance soil fertility and minimize erosion
    - Control all weeds and improve tobacco growth and productivity
- Fertilization should be:
    - Based on the nutrient status of the soil, crop requirements and experience of local conditions
    - Applied at the correct time and placed relative to the individual plants
    - With fertilizers approved for tobacco
- Only use agrochemicals when really necessary in accordance with IPM (see IPM Section)
- Optimize production per unit area by:
    - Adopting the most productive and sustainable cultural practices appropriate for the particular type of tobacco and locality, while maintaining desired quality
    - Achieving uniform crops and complete stands
    - Minimizing yield loss from physical damage to leaf, as well as from over-ripeness at harvest and over-coloring in curing
- Harvesting, Curing, and Market Preparation:
    - Harvest at the optimal time for the desired grade of tobacco
    - Cure properly to achieve optimal quality
    - Grade cured leaves correctly
    - Do not over-press bales
    - Store tobacco correctly to maintain quality
- Conduct research locally to further develop the concepts and details of GAP based on new developments locally and elsewhere and on feedback from local practical experience and innovation

IV. INTEGRATED PEST MANAGEMENT

Integrated Pest Management (IPM) is a systematic approach to crop protection that utilizes information to make better pest management decisions, with an emphasis on integrating all available methods. IPM does not mean completely eliminating agrochemicals, but rather their appropriate 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 laws and regulations.




Guiding Principles and Practices

- Integrated Pest Management prevention fundamentals:
    - Rotate tobacco with other crops that suppress tobacco pests and ensure a tobacco-free period between tobacco crops
    - Maintain accurate field records for all crops that include information on the field history, soil analysis, and pests, diseases, and weeds monitoring sheets
    - Monitor and survey future tobacco fields for possible diseases, weed problems, and production practices and review field records prior to tobacco planting
    - Collect soil and root samples for nematode identification and population determination
    - Use approved resistant varieties
    - Use certified, tested seed that is not infected by disease organisms
    - Use disease and pest free seedlings that are uniform and healthy
    - Plant the crop at a time least conducive to pest activity
    - Utilize trap and catch crops to prevent pests from infesting the tobacco crop
    - Promote the proliferation of natural pest predators and destroy alternative host plants
    - Avoid possible transfer of infection from tobacco products, waste tobacco materials or infected soil by maintaining strict hygiene in seed beds and during the early stages of field crop production
    - Clean or sterilise implements used in the production of seedlings and the crop regularly
    - Destroy seed beds and tobacco field crop residues as soon as possible after their respective productive cycles are completed
    - Destroy all waste tobacco material, such as scrap, at the end of each cropping cycle
- Integrated Pest Management control fundamentals:
    - Accurately identify pests
    - Know all aspects of the pest, such as life cycle, habits, damage caused to tobacco, presence or absence of natural predators
    - Monitor or scout frequently and systematically for infestation by pests, (traps are often useful monitoring tools)
    - Establish economic threshold levels for each pest to determine the appropriate level of action based on effective control measures
    - Ensure that any control measure used is approved or recommended for the target pest
    - Take measures to control a pest only when the cost of the control is lower than the damage caused to the crop
    - Control the pest when it appears in part of the field to avoid spread to the entire crop
    - Remove and destroy infected plants where this practice has been shown to be effective for the particular pest problem
- Integrated Pest Management chemical & biological control fundamentals:
    - Pursue alternative crop protection practices that minimize the use of synthetic pesticides
    - Use only those agrochemicals and biological agents registered and approved for tobacco for the particular pest problem, adhering strictly to label instructions and complying with all regulations and guidelines
    - Use Natural Crop Protection Agents (NCPA), such as biological control agents and plant extracts, as a first choice where they have been successfully tested and registered for tobacco. (Biological control agents are normally defined as naturally occurring parasites, predators and

pathogens used for the regulation of pest and disease problems. In most cases they are living organisms that will often reduce the population of a pest organism)

- Use synthetic agrochemicals only when NCPA and cultural methods fail to or are unable to control the problem(s). If used, their choice and application must be considered in relation to the IPM strategy, the environment, their feasibility, and being legally registered
- Maintain accurate records on all agrochemical applications including the active ingredient or product selected, amount applied, and the date of application
- Multiple control practices, methods and approved products should be utilized, only when needed, to avoid the development of pest and pathogen resistance to agrochemicals or other crop protection agents

- Monitor compliance by means of farm inspections and measurement of agrochemical residues in cured leaf in relation to national Maximum Residue Limits (MRL) or industry Guidance Residue Levels (GRL)

V. AGROCHEMICAL MANAGEMENT

Agrochemical use is often necessary in the production of agricultural crops such as tobacco. Agrochemicals should be used only after all other alternative pest, weed, and disease control measures have been utilized. 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.

Guiding Principles and Practices

- Guidelines and training programs for growers should be developed on the safe use of agrochemicals to protect all forms of life, the farmers' communities, and the environment. These guidelines should include:
    - The use of agrochemicals only when absolutely necessary and according to IPM
    - Using only agrochemicals that are specifically labeled for tobacco
    - Following all aspects of the label instructions carefully
    - The use of personal protective equipment (PPE) for the handling, mixing and application of agrochemicals
    - Safe application methods to safeguard people, wildlife, and the environment
    - The importance of harvest interval and re-entry times after application
    - The effect that agrochemical residues have on the usability of the crop
    - The correct storage of agrochemicals
    - Correct disposal of waste containers and residual spray solution
    - Relevant legislation, hazards and risks posed by agrochemicals, safe working practices, emergency and accident action plans, health surveillance and record keeping
    - Prohibition of eating, drinking and smoking while handling, mixing or applying agrochemicals
    - Prohibition of mixing and applying agrochemicals near open water courses

- Key principals and practices on the use of agrochemicals:
    - Adhere to all legal requirements when using agrochemicals
    - Select only formulations that have a label for use on tobacco
    - Follow application methods, post entry, and pre harvest intervals as stated on the product label
    - Address operator safety and adequate training before handling or applying any agrochemical
    - If used, 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
    - Minimize agrochemical use in terms of volume and range through targeted application and spot treatments.
    - Adopt developments that reduce the volume of pesticide
    - Minimize and, if possible, avoid any negative impact on the environment

- Obtain all agrochemicals from reputable sources and preferably as branded products from the original manufacturers
- Wear appropriate protective clothing as stipulated on the product label when handling, mixing and applying agrochemicals

- 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 control of the pest, disease or weed problem
  - It has been selected to suit the situation and is not harmful to natural predators of the pests and trap crops
  - It is specific in mode of action and not broad spectrum

- Agrochemical storage:
  - Issue appropriate personnel protective equipment (PPE) to all individuals involved with the handling, storage and use of agricultural chemicals
  - Store agricultural chemicals in facilities which are designed and designated for the purpose, and well away from wrapping materials and leaf
  - Store all agrochemicals as recommended on the Material Safety Data Sheets (MSDS) to ensure that the physical conditions of the store are appropriate. Concerns to be examined include: flash points, maximum safe storage temperature, humidity restrictions (caking of granules, corrosion of containers)
  - Identify all products designated as flammable or reactive. Isolate these agrochemicals from others and clearly identify all hazards, including specific measures to be taken in the event of a fire either within the store or externally
  - Secure all storages so that they are out of reach of unauthorized people, especially children, and also protected from 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 - e.g. a gully - and a stock of absorbent material held for treatment of spills. Floors should slope away from the entrances
  - Store agricultural chemicals in original containers with the original manufacturers labels. Any partially used containers must be closed firmly
  - Keep all agrochemicals well away from any fire hazard or flammable materials
  - Make available an emergency action plan to deal with unforeseen circumstances such as accidental spills, fires, flooding
  - Keep records of stocks, MSDS and specimen labels outside the store and ensure that they are available to the emergency services
  - Keep to a minimum the amount of agrochemicals in stores 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 safety and the environment
  - When purchasing large volumes of chemicals, the contract should include the right to return to the supplier unused stocks 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 before disposal and rendered non-reusable (e.g. punctured). Any possibility of empty containers being used for other purposes should be avoided
  - Agrochemical rinse water should be added to the original spray solution and applied to the crop
  - It should be determined whether the supplier or manufacturer has a recycling scheme for empty containers. General recycling schemes should not be used for pesticide containers without clearance from the scheme's custodians
  - Empty containers must be disposed of in accordance with local legislation
  - Unwanted concentrated synthetic agrochemicals should not be disposed of by burning, burying, pouring into storm drains, sewer systems or any kind of water course

VI. FORESTRY

Tree management is an important part of GAP, as wood products are often important construction materials for curing barns, on-farm tobacco storage and handling facilities, and a key source as a fuel for curing and domestic use in many origins. In addition, trees also enhance the landscape, provide habitats for wildlife, assist in the improvement and protection of air, soil and water, as well as provide additional food crops and income to producers.

Guiding Principles and Practices

- Trees role in conservation:
    - They improve air quality by absorbing carbon dioxide and releasing oxygen
    - They decrease soil erosion related to wind and rainfall through improved water infiltration, they act as windbreaks, their roots stabilize soils and their leaf litter serve as mulch
    - They decrease the risk of flash flooding by slowing both rainfall impact upon the ground and surface rainwater movement
    - They improve water quality by decreasing erosion and the risk of sediments in runoff rainwater
    - When grown along open water courses, trees decrease water pollution, stabilize river banks, moderate water temperatures by shading, and improve wildlife habitats and food sources for aquatic life
- Tree management:
    - Consider local (indigenous) tree species first and promote biological diversity in forestry
    - Consider tree plantings on soils unsuited to cropping, waste land and steep slopes
- Trees for construction and fuel:
    - Introduce tree planting schemes
    - Ensure that the wood supply is efficiently managed on a fully sustainable basis and strive to achieve self-sufficiency in the shortest practical period
    - Seek alternative fuels that are by-products of renewable resources, such as saw dust and stover, or waste products such as coal dust
    - Consider non-wood construction materials where feasible

VII. 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. However, final leaf quality cannot be improved upon if the barn is filled with inferior quality fresh leaves or plants. Various barn designs and curing techniques are employed in different tobacco producing area, depending on desired styles, available fuels and construction materials and economic efficiencies. The use of indirect heat or heat exchanger technology for those tobaccos that require supplementary heat during curing has been commonplace within the industry and is often a precondition for leaf sales.

Guiding Principles and Practices

- Curing barn design should consider:
    - Selecting construction materials that are structurally sound, long lasting and from sustainable and renewable sources, and are economical viable for farm use
    - Designs that maximize locally available technology and infrastructure
    - The use of automated fuel feeding and automating curing control devices as they can decrease labor requirements, help to optimize cured leaf quality, improve fuel efficiency and decrease cost
    - Designs that meet farmers' crop capacity in order to maximize barn filling and curing efficiencies (avoiding under and over barn capacity during the crop cycle)
    - Designs that minimize labor requirement needed to fill and unload the barn
    - Barns, where required, that incorporate the most efficient furnaces available

- Furnaces that provide indirect heat and prevent combustion gases from entering the curing chamber
- Using hygrometers to either automatically or manually control relative humidity in flue curing to avoid wasting fuel and to optimize leaf quality and yield
- Air cured tobacco barn orientation and placement with regards to prevailing winds
- Air cured tobacco barn ventilation controls for humidity and air-circulation including the use of hygrometers

- Curing fuels:
    - The fuel used for tobacco curing should be the most appropriate for each geographic location
    - Use fuel from renewable sources, if available
    - Conserve fuel by employing the most energy efficient curing structures and heating equipment, balancing barn (kiln) capacity with its capability to cure efficiently and curing by the technique that optimizes output while maintaining the desired cured leaf quality
    - Where wood is the major fuel introduce tree planting schemes and develop them to be self-sufficient and sustainable

VIII. ON-FARM STORAGE

On-farm storage is often necessary to hold tobacco from the time it has completed curing, through grading and baling, until it is ready to be marketed. Correct tobacco leaf conditions are required to avoid deterioration in quality and loss of yield. The facility should provide safe and secure storage for the tobacco.

Guiding Principles and Practices

- Tobacco for storage should:
    - Be stored at the correct moisture and density
    - Be free of any Non-Tobacco Related Materials (NTRM), contamination or infestation
    - Be regularly inspected for infestation, deterioration in quality, and fermentation
    - Not have any agrochemical product applied post harvest
    - Not be over pressed during baling

- Storage facilities should:
    - Be clean, dry and properly ventilated structures that are free of NTRM and constructed of an appropriate material that has not been treated or contaminated by chemicals that could transfer to the tobacco
    - Have doors that are tight fitting and securable
    - Have windows and other openings that are sealable and ventilation openings covered with screen-wire, or other materials, to prevent insect and pest entry
    - Be monitored and inspected for leaks, damage, and infestation
    - Not be used for agrochemical or other products that could contaminate the tobacco
    - Have good site hygiene and sanitation, with the removal of all tobacco scrap and by-products within and surrounding the area storage facility

- Chemical and fumigation controls are generally not recommended for on-farm storage. This should only be done in accordance with all laws and by specially trained applicators

IX. NON-TOBACCO RELATED MATERIALS (NTRM) / FOREIGN MATTER

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 hessian fibers. 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 and storage and subsequent operations in the supply chain.

Guiding Principles and Practices

- Provide training and increase awareness on NTRM issues and the importance of clean tobacco throughout the supply chain
- Develop a proactive program to eliminate and avoid any tobacco contamination and infestation sources on the farm
- Remove all forms of NTRM from tobacco handling, curing, and storage areas
- Inspect all facilities, machinery and equipment for NTRM contamination
- Follow Crop Management Practices to control weeds and grasses in the field
- Monitor and inspect farmer facilities and bales for NTRM throughout the supply chain and the production cycle
- On-Farm inspection and monitoring checklist facilitates rapid assessment of potential NTRM contamination. Farm level NTRM checklists often includes:
    - Focus upon the individual stages of the production cycle (e.g. seedbeds, field, harvesting, curing, grading, etc.)
    - Specific items to be inspected for each stage of production (e.g. weed control in the field, non-synthetic string for tying, animal and insect barriers for tobacco storages, etc.)
    - Inspection items for all tobacco handling areas, facilities, equipment, and storages
    - General farm sanitation and cleanliness components
    - A review of all materials and products used in tobacco production, handling, curing, and storage
    - A measure on training and awareness programs
    - A mechanism to provide feedback and action plans to reduce NTRM contamination
- Maintain traceability of farmer bales to track and identify NTRM issues and introduction sources
- Establish bale inspection procedures and frequencies
- Provide feedback to farmers when NTRM is identified in their tobacco post purchase
- Consider reward and recognition programs for farmers that consistently provide a clean product
- Establish rejection parameters for tobaccos contaminated with NTRM
- Consider a NTRM based farmer rating system

X. FARMER TRAINING

Farm training is one of the most important elements of any GAP program. It provides an opportunity to update farmers on the latest technology and crop advancements, and address the value of GAP. Farmer training is achieved by various methods around the world and a multitude of training tools and techniques are utilized. Farmers receive training on GAP from company agronomists, industry groups, institutions and universities, government agencies, and/or private consultants. Often individual visits, group meetings, field days, radio and television announcements, and printed booklets, brochures and posters accomplish the farmers' training and education requirements.

Guiding Principles and Practices

- A GAP training program should:
    - Provide continuous training and education in all the elements of GAP to ensure that everyone involved in the crop is aware of its importance
    - Address legal requirement, industry expectations, safe working conditions, child labor prevention, proper agrochemical handling, application, storage and disposal, variety integrity, soil and water management, crop management, IPM, NTRM, forestation, curing and barn management, on-farm proper tobacco handling, grading and storage

- Have formal training schedules for all staff, contractors and farmers
- Have initial training/education session in each area and be followed up with refresher courses each season at the appropriate time for the crop
- Consist of group meetings, enhanced with visual aids such as posters, charts and multimedia, as well as practical group demonstrations in addition to individual farmer/farm visits
- Maintain training records on courses held and those who attended (including signature of instructor and trainee)
- Consist of guidelines, recommendations, growing manuals, etc, and on the job training for good field management and GAP guiding principles
- Cover relevant legislation, hazards and risks posed by agrochemicals, safe working practices, emergency action, health surveillance and record keeping
- Introduce integrated pest management schemes that reduce the reliance on agrochemicals




XI. SOCIO-ECONOMIC ISSUES

Socio-Economic Issues consists of items that are both directly and indirectly linked to tobacco production. Cost effective production of a high yielding and excellent quality crop improves the farmer's profitability and is directly connected to tobacco production. The effect of child labor use in tobacco production might not be as obvious, but is an extremely important socio-economic issue. Children should attend school and not be regarded as a labor source for the production of tobacco. Farmer family labor is sometimes used in the production of tobacco. Where family labor is used, it should not result in the deprivation of schooling and other educational opportunities, and no untrained or minors should perform any dangerous or hazardous tasks.

Guiding Principles and Practices

- Promote acceptable and safe working conditions and avoid the use of under-age labor
- Minors and untrained laborers should not perform potentially hazardous activities
- Adhere to any legislation on the employment of all labor, including the farmers' family
- Promote educational opportunities
- Protect farmers' health and reduce the level of hard (manual) labor wherever possible
- Optimize yields, quality and farmers' margins while maintaining both global and local competitiveness
- Calculate the cost of production
- Define and quantify labor and machinery requirements of the crop

GAP PROGRAM EVALUATION AND ACTION PLANS

Several GAP programs, currently implemented within the industry, have some form of evaluation to gauge the current adherence to GAP principles and practices and to measure improvement in GAP over time. Whether a percentage of compliance or point/level scale is used is a matter of company preference. The important aspect is that a quantifiable measurement is in place to better understand the implementation and commitment to GAP principles within an organization and/or specific origin.

Likewise, several GAP programs have sections for the development of action plans to chart the future plan for improvement in the area of GAP. The choice of terminology for such action plans, their duration or the time frame they cover is also matter of company preference.

GAP PROGRAM EVALUATION AND ACTION PLANS

The following list contains web sites and links and contact details for various GAP related information.

http://www.coresta.org

http://www.nagcat.org/categories.htm

http://www.ctic.purdue.edu/CTIC/CTIC.html

http://www.cdms.net/pfa/LUpdateMsg.asp

http://www.fao.org/

http://www.nsc.org/issues/agrisafe.htm

http://www.nrcs.usda.gov/

http://lwf.ncdc.noaa.gov/oa/ncdc.html

http://www.aosca.org/oecd/index.htm

http://www.ppi-ppic.org/

http://www.state.tn.us/agriculture/regulate/aip/wastes.html

http://www.tfi.org/index.asp

http://water.usgs.gov/nawqa/

http://www.weedscience.org/in.asp

http://www.ncagr.com/

http://water.dnr.state.sc.us/water/envaff/river/rivmap.html

http://h2o.enr.state.nc.us/basinwide/what_is_basinwide_planning.htm

http://www.ams.usda.gov/tob/

http://www.fsa.usda.gov/pas/

http://www.gpoaccess.gov/fr/index.html

http://www.ers.usda.gov/publications/so/view.asp?f=specialty/tbs-bb/

http://www.ipmcenters.org/

http://www.usda.gov/

http://www.kyagr.com/enviro_out/pesticide/index.htm

http://www.agr.state.ga.us/html/pesticide_recycling.html

http://entweb.clemson.edu/pesticid/saftyed/rnsequip.htm

http://www.clemson.edu/peedeerec/Tobacco/default.htm (Clemson University)

http://tgi.ncsu.edu/ (NCSU Tobacco Genome Initiative)

http://www.ces.ncsu.edu/resources/crops/tobacco/flue.shtml (NCSA Flue-cured tobacco)

http://www.ces.ncsu.edu/resources/crops/tobacco/burley.shtml (NCSA Burley tobacco)

http://tobaccoinfo.utk.edu/ (University of Tennessee)

http://www.griffin.peachnet.edu/caes/tobacco/ (University of Georgia)

http://www.uky.edu/Ag/Tobacco/ (University of Kentucky)

http://edis.ifas.ufl.edu/TOPIC_Tobacco (University of Florida)

http://www.ext.vt.edu/cgi-bin/WebObjects/Docs.woa/wa/getcat?cat=ir-cg-cr-to-Virginia Tech

Supporting Contributors

British American Tobacco Company

Dimon Tobacco Company

Imperial Tobacco Group

Japan Tobacco Group

Philip Morris International

Philip Morris USA

R.J. Reynolds Tobacco Company

Standard Commercial Tobacco Company

Universal Leaf Tobacco Company

CORESTA

Good Agricultural Practices (GAP) Guidelines