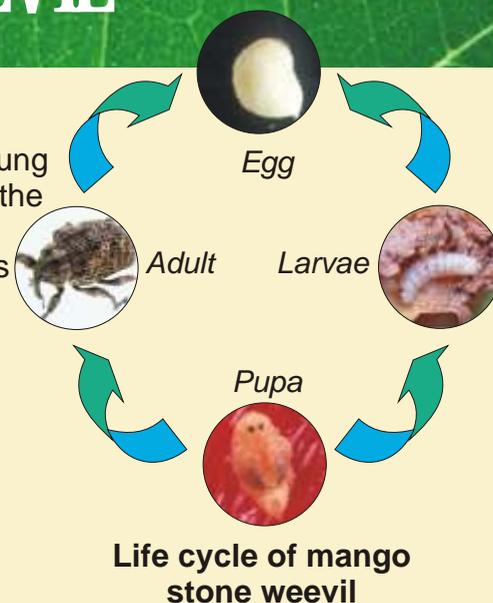


MANGO STONE WEEVIL

Host range

The weevil attacks only mango. The adult weevil lays eggs into young fruits. The eggs hatch into larvae which bore through the pulp into the seed where they feed. Mature larvae pupate inside the seed and adult bore holes through the fruit and emerge. Adults hide in crevices and cracks on the back of old mango to avoid drying up. They move to the tree canopy during the flowering and fruiting season and continue the cycle.



Adult



Damaged seed



Emerged adult

Life cycle of mango stone weevil

Damage caused

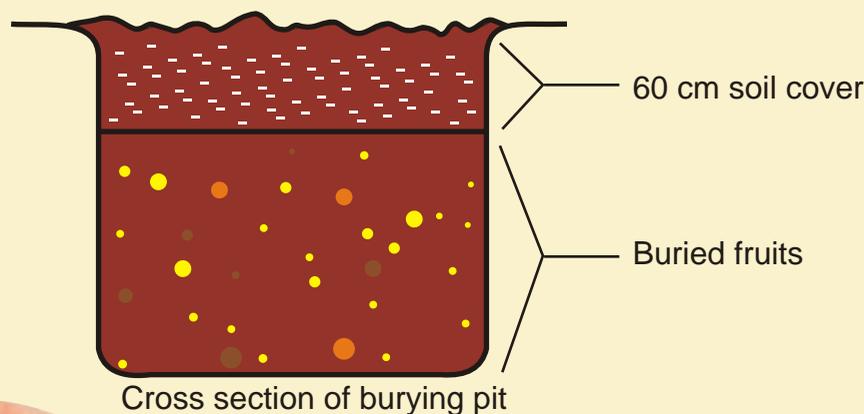
- Infestation at early fruiting stage cause pre-mature fruit drop resulting in reduction of yield
- Infested seeds may not germinate

Management option

Farm sanitation

(1) Pick dropped fruits from the farm and bury deep in the soil (at least 60cm below soil surface)

Sketch



Cross section of burying pit

(2) cultural practice

- Seedlings producers must avoid using infested seeds
- De-husk seeds before planting
- Always burn the husk material after de-husking
- Turn soil under tree canopy lightly (not more than 10cm deep/to expose pupae to sunlight)

(3) Chemical control

- Apply approved pesticide when fruits attain pigeon egg size
- Repeat pesticide application after two weeks

Note: Observe pre-harvest interval

FRUIT FLY

The fruitfly attacks several fruits such as: mango, citrus, guava and vegetables

DAMAGE AND EFFECT OF ATTACK ON FRUIT

When the female flies pierce into the fruit they deposit their eggs inside which hatch into larvae after 2-3 days. The larvae then live and feed in the fruit till they mature and then jumps out of the fruit. When this happens the economic damage is severe because a lot of the fruit drop prematurely. It is important to note that the pest is of prime quarantine concern and management/control strategies need to be embarked on immediately before its devastating effect are felt in the horticultural industry



Life cycle of fruitfly

Damaged mango fruits



Cultural practices

Turn soil under tree canopy lightly (not more than 10cm deep) to expose pupae to sunlight

Use paper bags to cover well developed fruits where applicable

Harvest fruits early at physiologically maturity

Chemical control

Use traps

Trap adults using recommended pheromone traps

Baiting flies

Using food bait like:

- Molasses plus pesticide or
- Hydrolysed protein plus pesticide or
- Yeast extract plus pesticide

Steps in baiting

Spray food bait on un-fruited part of plant eg leaves, trunks, branches, and twigs

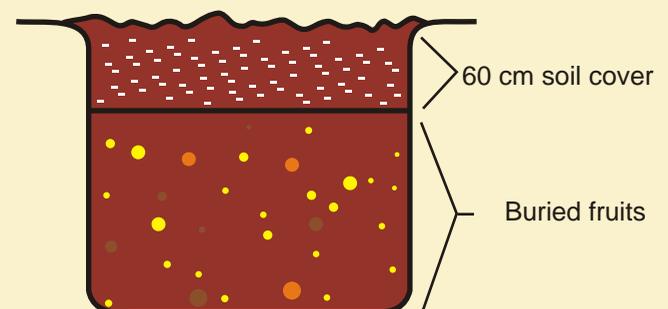
Note: Observe pre-harvest interval

Pesticides application

- spray recommended insecticide. *Note: Observe pre-harvest interval*

Management option

- Pick dropped fruits regularly from the farm
- Burry picked fruits deep in the sand (at least 60cm below soil surface and spray recommended fungicide and insecticide at the dumping site



Cross section of burying pit



Pheromone Traps

ANTHRACNOSE DISEASE

Introduction

Anthracnose is caused by fungi mostly in humid environments and attacks the leaves, twigs, flowers, and fruits.

PARTS AFFECTED



fruits



Flowers



Leaves

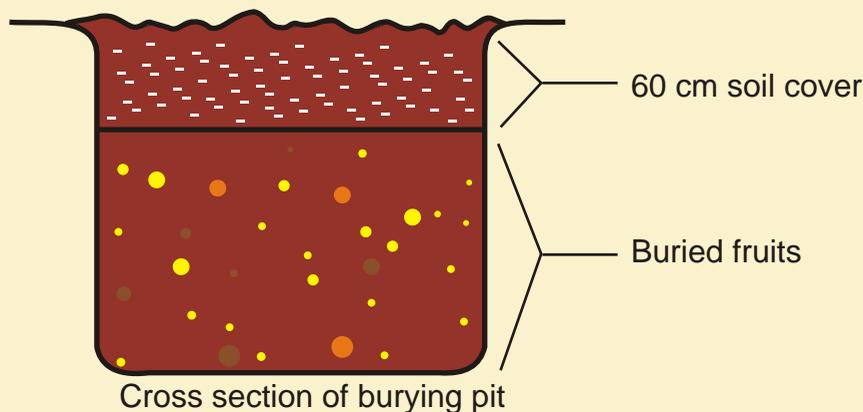
Potential economic implication

Premature fruit drop
damage fruit

MANAGEMENT OPTION

Farm sanitation

Collect all fallen fruits and bury (at least 60cm below soil surface and spray recommended fungicide at the dumping site).



Remove all disease parts e.g. dead twigs, infested leaves, and fruits from the field and burn. Prune periodically to reduce humidity in the plantation.

Chemical control

Follow the recommended pesticide regime, especially targeting the following stages:

- The flush
- Flowering
- Fruit set and fruiting

Post harvest treatment

- Use recommended post-harvest fungicide
- Observe pre-harvest interval

POWDERY MILDEW

Powdery mildew is a fungal disease of mango that affects the leaves, panicles and fruits. The disease appears like a whitish grey powdery growth covering the normally reddish mango panicle. Infected flowers and fruits turn brown and dry.



Leaf

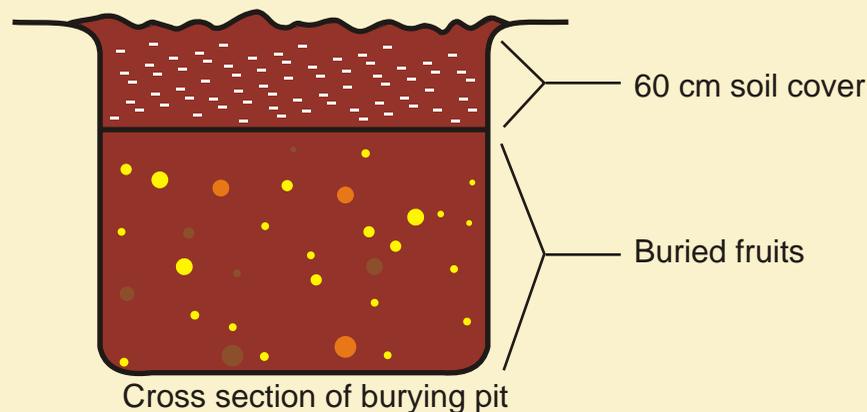


Flowers

MANAGEMENT OPTION

Farm sanitation

- Collect all fallen fruits and bury (at least 60cm below soil surface and spray recommended fungicide at the dumping site).



- Remove all disease parts e.g. dead twigs infested leaves and fruits from field and burn
- Prune periodically to reduce humidity in the plantation

Variety

- Choose varieties that are less susceptible to powdery mildew. Keitt and Hadden varieties are moderately susceptible but Kent is highly susceptible.

Chemical control

Use recommended sulphur based fungicides at two weeks interval from pre-flowering until fruit set.

MEALY BUG AND SOOTY MOLD

They are small, oval and usually mobile insects covered with waxy secretions.

Damage caused

- They are sap feeders and by this alone can cause debilitation of the mango tree.
- Mealy bugs excrete honey dew, which promotes the growth of sooty mold that is both unsightly and inhibits photosynthesis.
- Affected fruits losses it market value
- Heavy infestation causes leaves and flowers to drop, reducing fruit set.



Mealy bug



Sooty mold

Management option

Farm sanitation.

- ? Good farm sanitation by clearing all weeds and other dead plant parts that serve as alternate hosts for the mealy bugs.

Cultural practice

- ? Regular inspection of the farm to ensure early detection and control of ants and mealy bugs and also sooty mold.
- ? Avoiding to park vehicles under mango trees in mealy bug infested areas. Trucks and other vehicles carry and spread mealy bugs to especially new farms.
- ? In severe cases, prune affected branches and burn.

Chemical control

- ? Insecticidal soap solution (Alata soap) can be used at the rate of 1-2% to control mealy bugs.
- ? Apply recommended pesticides

WEED CONTROL

It is very important to keep mango fields free from weeds throughout the year because of the following reasons:

Weeds serve as good alternate hosts for pests and diseases of mango.

During very dry weathers, weedy mango fields can be easily swept through by bushfires.

MANAGEMENT OPTION

Manual

Weeds can be controlled routinely by hand weeding the whole farm with a cutlass and Hoe.

Mechanical

Weeding can be done in between the rows with tractor mounted slashers, plough or harrows and then manually weeding around the individual trees with the cutlass or selected herbicide.

Mulching

Mulching around the base of the tree with dead plant materials, also suppresses weed growth within the mulched areas. Until fruit set then stop mulching

Herbicide application

Spraying with recommended herbicides is also a good practice.



FLOWER INDUCTION

Flower induction or forcing is a practice in which recommended chemicals are applied to matured mango trees at the appropriate time to enhance flowering.

Nitrate sprays can be used to induce flowering providing:

Trees are mature

Leaves must have a dark green colour

Fruit buds are prominent

Water stress has been applied

In more temperate areas this treatment is not as effective,

cold nights have a greater influence.



Forcing



Flower



Some leaf burn may occur

Nitrogen stress and water stress are critical components to inducing flowering

Leaf nitrogen levels need to be below some critical levels for flower induction sprays to be effective.

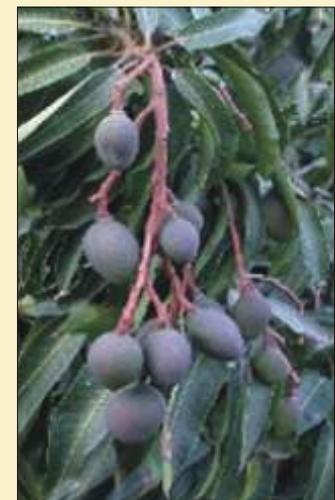
These levels will vary with variety.



Poor fruit set



Ideal fruit set.



Excessive fruit set

NITRATE percentage can be between 3-5%

SOIL TESTING AND INTERPRETATION OF SOIL ANALYSIS RESULTS

In agriculture, a **soil test** is the analysis of a soil sample to determine nutrient and contaminant content, composition and other characteristics, such as acidity or pH level.

Soil testing is often performed by commercial labs that offer a variety of tests, targeting groups of compounds and minerals.

Laboratory tests often check for plant nutrients in 3 categories:

? Major nutrients: nitrogen (N), phosphorus (P), and potassium (K)

? Secondary nutrients: sulphur, calcium, magnesium

? Minor nutrients: iron, manganese, copper, zinc, boron, molybdenum, chlorine

Preparation for soil sampling

Items needed



Labels



Sampling bags



spade



Plastic bucket



Auger,



Permanent marker



Chisel



Field note book



Cutlass



trowel

How to take **samples for soil analysis**

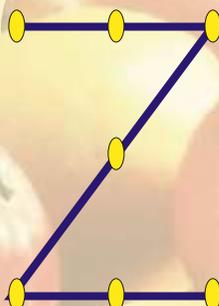
For soil chemical analysis, a representative soil sample should be taken from the field.

It is important that samples are taken from uniform areas with the same history of usage.

The samples should be taken either along the Z-plane or the Y-plane.

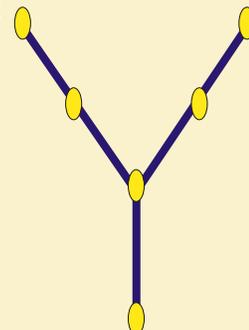
Sampling along a Z-plane in a field plot

● denotes equidistant sampling spot



Sampling along a Y-plane in a field plot

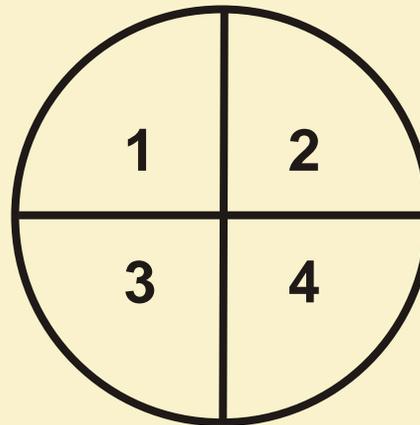
● denotes equidistant sampling spot



SOIL TESTING AND INTERPRETATION OF SOIL ANALYSIS RESULTS

Clear site and remove all above ground biomass until soil surface is revealed.
Take a sample either from the layer 0-15 cm or 15-30 cm. For Mango, take the first sample from the layer 0-15 cm and the second sample from the layer 15-30 cm.
Remove un-decomposed plant materials and package the soil samples according to depth of sampling.
Air-dry soil samples at home. Spread out the dried sample in a circle and then take combined samples by taking a handful from each of the four quarters .
The sample is then put into plastic bags.

Soil sampling



A sample of air-dried soil is taken from 1st, 2nd, 3rd and 4th quarters

Labelling:

Add a label from non-perishable material inside the bag.

In addition, label the bag on the outside, too.
The following information is put on the label:

- Date of sampling
- Depth of sampling (from ... to ...)
- Name of person doing the sampling
- Description of plot
- GPS Coordinates (taken with a GPS handset)
- History of the site (previous use, grazing, etc.)

Interpreting soil analysis results

- ? Tests are usually performed to measure the expected growth potential of a soil.
- ? A soil test measures fertility, indicates deficiencies that need to be remedied, and determines potential toxicities from excessive fertility and inhibitions from the presence of non-essential trace minerals.
- ? The test is used to mimic the function of roots to assimilate minerals.
The expected rate of growth is modeled by the Law of "limiting factor". According to this law the most deficient nutrient determines the overall yield

SOIL pH AND LIME APPLICATION

Soil pH is a measure of soil acidity. Most crops grow best if the soil pH is between 6.0 and 7.5.

Soil pH ranges.

pH

strongly acid below	5.1
moderately acid	5.26.0
slightly acid	6.16.5
neutral	6.67.3
moderately alkaline	7.48.4
strongly alkaline above	8.5



Calcium carbonate

The target pH is determined by the crop to be grown and possibly by other factors. Soil pH can be increased by liming. The soil pH test indicates *if* lime is needed. The lime requirement test determines *how much* lime is needed.

Lime application rates to raise soil pH by approximately 1 unit

Lime Application Rates*	Sandy soil	Loamy soil	Clayey soil
kg per 100 m ²	10	12	17
50-kg bags per acre	8	10	14

Lime application rates are for dolomite and ground limestone assuming a soil organic matter level of approximately 2% or less. Increase the lime application rates by 20% on soils with 4-5% organic matter. Individual applications should not exceed 25 kg per 100 m². Avoid the use of burned lime.

Selected soil laboratories in Ghana

Ghana Atomic Energy Commission, P.O. Box LG80, Legon, Accra
Mr Nettey, Mobile: +233 572074240, Tel.: +233 302400310, Fax: +233 302 400807

SGS Ghana Limited, Ridge Road, Roman Ridge, P.O. Box 732, Accra
Ms. Christina Gaisie, Tel.: +233 30320504514, +233 3027739 94/95

University of Ghana, Faculty of Agriculture, Soil Science Department, Legon, Accra
Mr. Benart-Aniba, Mobile: +233 243104878

FERTILIZING MANGO

Use tissue analysis to correct trace element deficiencies

mangoes.

year

Collect 5 to 6 month old 'spring flush' leaves.

Take samples after flowering from both fruiting and non fruiting branches.

Nitrogen rates must be managed

To ensure fresh vegetative growth occurs but does not dominate over flower induction.

To reduce the effects of biennial bearing

Phosphorus rates are applied according to soil tests.

Potassium and Calcium are needed for fruit quality

Nitrogen to Calcium ratios in the leaf are critical and should be below 0.5.

Nitrogen

Essential for yield and quality

Nitrogen will

Increase fruit weight

Increase fruit number

Excess nitrogen leads to too much vegetative growth, no production of flowers and low yields.

Nitrogen deficiency

Leaves are uniformly yellow and chlorotic

Growth is stunted



FERTILIZING MANGO

Phosphorus

Adequate phosphorus levels

In the presence of nitrogen

Increases duration of flowering

Increases fruit set

Increases yield per panicle

Decreases fruit drop



Phosphorus deficiency

Growth is stunted

Older leaves become necrotic from the leaf tip and die off prematurely

Potassium

It promotes a uniform ripening

It increases sugar content

It improves the post-harvest

Increases yield

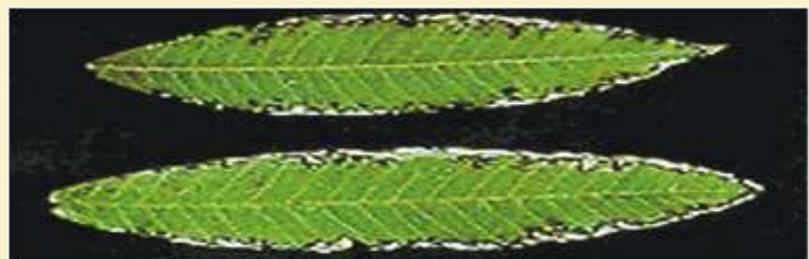
Increases fruit weight and size

Potassium deficiency

Leaves have necrotic margins

Fruit may abort

Tree growth is stunted



FERTILIZING MANGO

Calcium deficiency

Fruit has internal breakdown (becomes brown inside) Tissue at the fruit tips goes soft in texture (Soft Nose) Nitrogen to Calcium ratios in the leaf are critical and should be below 0.5.



Poor internal quality



Post harvest Calcium



Weight loss and shrivelling

Fruit with higher levels of calcium will ripen more slowly and so transport better.

- Delays ripening by at least 5 days
- Has no effect on eating qualities
- Causes no skin injury
- Higher rates tended to 'spot' the skin Ca in fruit
- Calcium is important for shelf-life
- Weight loss and shrivelling

PRUNING

Pruning is a horticultural practice involving the *selective* removal of parts of a plant, such as branches, buds, or roots

Why do we prune

- For the tree to have a good architecture and canopy
- To introduce sunlight and easy alternate bearing, fruit color, easy harvest
- Remove dead and trailing branches after harvest
- To improve the health of the tree and control its growth.
- A well-pruned compact tree helps achieve effective chemical use against pests and Diseases
- Effective pruning encourages the development of new shoots which grow into lateral branches.
- Pruning also prevents branches from breaking off anyhow.



Young pruned tree

BASIC PRUNING TOOLS



Pole pruner



Extendable loppers



Secateur



Pruning saws

How do we prune

Pruning on a young mango tree:

Allow the young mango tree to grow up to 70cm or 27.5 inches in height.

Cut back the growing point to a height of 60cm or 24 inches. Cutting back the growing point encourages the development of lateral shoots which become lateral branches growing from the trunk of the tree.



Ladder



Topping up



Trees with lateral branches

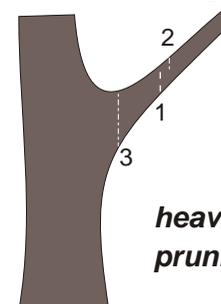
When the lateral branches reach the thickness of a pencil, cut back the growing points at 12 inches. This will lead to further branching of each terminal shoot. Such pruning regimes eventually produce trees that grow with well-positioned branches and well-shaped crowns.

Allow 3-4 side branches always to an oval bud to develop in different directions as basic framework of the tree.



Pruning at oval bud

For heavy branches first undercut away from the final cut, hence uppercut, then final cut. Cut at an angle for water to run off. Remove young shoots after pruning.



heavy branches pruning steps

PRUNING

BEARING TREES

Mango trees normally respond to pruning by sending out a vegetative flush, usually the heavier the pruning the more vigorous and numerous the flushes. To complicate the issue further mango trees are terminal bearers, **i.e. they flower from the ends of the branches and will only flower on mature wood, i.e. shoots that are six weeks or older.** It is therefore most important to ensure that the trees do not have vegetative flushes near flowering time, which is usually end of May into June. However, if the grower decides to **prune his trees**, there are two main times when this should be done.



Bearing tree

FIRST PRUNING - AFTER HARVEST

This should be done immediately after harvest . Types of pruning at this time include:

Skirting

This is the removal of low hanging branches which could hinder orchard operations such as fertiliser application and under tree spraying for weed control.

Opening up.

This is the removal of branches inside the tree which cross over or clutter up the centre of the tree restricting the penetration of sprays.

Hygiene.

This involves the removal of any diseased or dead branches in the tree, which could be a source of infection.



Opening up mango tree



PRUNING

SECOND PRUNING- PRE FLOWERING

The time span when this pruning can be safely done is limited to a quite short period about two to four weeks ie before flowering.

Skirting

Removal of low hanging branches which could cause fruit to drag on the ground, making it un-saleable.

Opening up

Removal of twigs and branches cluttering up the inside of the tree, as well as opening up the top. This not only facilitates spray penetration for better insect and disease control but also allows light into the tree, improving fruit colour.

Reducing tree size

Cutting back large limbs to reduce tree size is always risky with mangoes as you may lose two or more years' production, depending on the amount cut back. However, if the timing is right flowers can develop on even large branches which have been cut back.

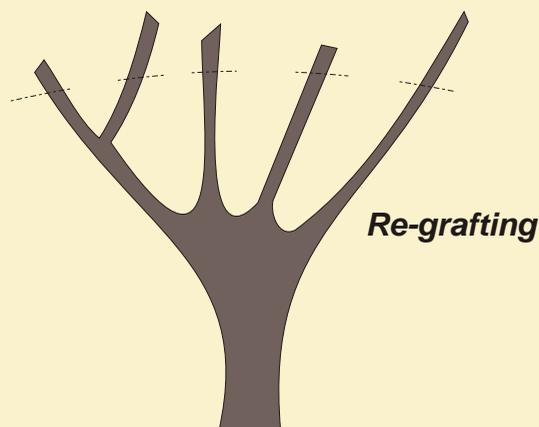
One method of reducing or spreading the risk is to cut back only one or two branches each year, or cut back one side only per year. Although the pruning time is short the second pruning is the best one for major cutting back.

Hygiene

It is essential to reduce the source of flower and fruit infection. Any diseased or dead branches should be removed before flowering.

REJUVENATING OLD TREES

Old trees are often difficult to harvest, due to their size, and can have a build up of pests (mainly scale) and disease as it is difficult to reach the whole tree when spraying to control them. It is possible to cut these trees back to a more manageable size or by re-grafting the tree, but depending on the severity of the pruning you may lose as many as three crops. On the plus side fruit production should improve together with fruit size and quality, once trees have recovered.



Collecton of debris

SAFE PESTICIDE USE

The **wrong** use of Pesticide causes numerous problems for the health of workers, consumers and the environment. Pesticides can however be handled virtually without presenting a health hazard if the operator acts carefully and uses the recommended skills.

To achieve this, one need to follow the recommended safety precaution given on each product label strictly and adhere to the following **GOOD AGRICULTURAL PRACTICES (GAP)**



Routes of intoxication

Pesticides can enter your body through:

1. The **Nose** by inhaling and breathing
2. The **Eyes** by splashing
3. The **Mouth** by eating ,drinking and smoking
4. The **Skin** during splashing and dripping of the chemicals

The symptoms of acute pesticide poisoning are; skin irritation, headache, dizziness blurred vision, vomiting and stomach upset. To avoid pesticide poisoning it is essential to wear **PERSONAL PROTECTIVE EQUIPMENT** before spraying.

PERSONAL PROTECTIVE EQUIPMENT



OVERALLS

- The overall should be made of washable material.
- Overalls should be worn over a long-sleeved shirt and long trousers. .



GLOVES

- **Wear** gloves with "CE" sign and chemical resistant sign,
- Rinse gloves thoroughly after use.
- Leather gloves are not good for pesticide handling since chemical can go through gloves and torch your skin



BOOTS

- Rubber boots are sufficient if they are used correctly,
- keep your trousers outside the boots to prevent chemicals from entering.
- Do not wear torn boots



PROTECTIVE GLASSES

- Wear protective glasses that completely cover the eye area from splashes from mixtures.
- Avoid glasses with elastic strip since they tend to absorb chemicals by the cloth strip.



NOSE MASK

- Use the filter that sieves the chemical.
- Change the filter regularly
- Do not use Dust mask, they can only prevent dust
- Fumes can go through a dust mask



HEADGEAR

- Cap made of non-cotton materials (polyester etc.) is better
- Cap made of cotton easily absorbs chemicals.



SPRAYING PROCEDURES

SPRAYING PROCEDURES

BEFORE SPRAYING

- Use a sprayer which is in good condition, avoid leakage.
- Check the weather condition before you spray, early morning or late afternoon is good when the weather is cool.
- Don't spray when the weather is windy, sunny, raining or threatening to rain
- Check the wind direction before spraying. (This can be done by fetching some sand and throwing it up.)
- Adhere to product label



DURING SPRAYING

- Put your back to the wind
- Spray evenly by keeping the same speed.
- Keep children and animals away
- No smoking, eating, drinking, singing etc



SPRAYING TECHNIQUES

Follow the following procedure while spraying

Step1- Spray The Tree starting from stem to branches

Step 2 -Spray The inner portion of leaves of the mango tree

Step 3-SprayThe peripheral starting from down to top

NB: Start systemic applications and spray only internally until 2 months before harvesting

AFTER SPRAYING

- Make sure the knapsack is empty
- Put up a danger sign at the site and re-entry period date
- Record the application
- Wash all the equipment at the site but away from water source.
- Wash personal protective equipment at the site and bathe right away

WARNING
AREA TREATED
WITH PESTICIDES
DO NOT ENTER

HARVESTING

Harvesting Tools

Tools needed for harvesting include, harvesting crates, newspapers or a thin foam, secateurs, harvesting poles, penknives, harvesting racks and ladder.



Ladder



Harvesting Poles



Harvesting Racks



Newspapers



Harvesting Crates



Penknives



Secateurs



Thin Foam

Normally, fruits reach the green maturity stage in 100-150 days after flowering depending on the variety. An early maturing variety like Haden for example, will mature in 100 days after flowering. Planting the Haden variety therefore makes it possible for the farmer to harvest and market fresh mangoes earlier in the season, when there is little or no mangoes on the market, thus earning an early and good income. Keitt and Kent are late maturing and therefore will mature much later in the season.

Features of a matured mango:

- The skin colour changes from dark green to light green.
- The skin texture changes from rough and coarse to a light and smooth appearance.
- The fruit has a bluish and powdery appearance.
- The fruit shoulders fill out and the peduncle sinks.
- The beak at the bottom of the fruit fills out.



Matured Fruits

HARVESTING

Picking Fruits:

Use a harvesting tool such as a pair of secateurs to harvest fruits that can be reached easily. Use a picking pole for fruits high in the canopy.

Pick fruits with the peduncle and lay them on their side in the crate to reduce stalk breakage and sap contamination. Protect fruits from injuries and bruises by lining the crates with soft materials like foam or newspaper.



Cutting Peduncle



Cutting stalk



Harvesting with a pole



Harvested fruits in a crate

Handling Picked Fruits

On farms where harvesting racks are used, cut back fruit stalks and turn them upside down to sit on the harvest racks to drain the sap.

Prevent direct contact of fruits with the ground to avoid contamination. Handle fruits with care at all times to prevent bruises and injuries. Fruits dropped from a height greater than 30cm on the hard surface will suffer from internal cracking and will not ripen well.



Harvesting rack

Packing fruits

Always keep crates with harvested fruits under shade to prevent fruits from the effects of direct sunshine before sending them to pack house. Transport fruits from the farm to the pack house in containers and vehicles used exclusively for this purpose.

Packaging Fruits

Fruits should be graded and packed into standard size boxes for export. Pack fruits into boxes according to variety, flesh firmness, uniformity of skin colour, size and shape. The boxes are then packed beautifully onto pallets ready for the market.



Packed fruits for export



Farmer sorting fruits



Packed fruits for export

HYGIENE

1. Farm hygiene

- Keeping your farm hygienic is essential for production of safe products. By putting up a display on general

hygiene instructions, workers and anyone else who comes to the farm can always be reminded to keep the farm hygienic.

Example of a farm hygiene poster



- General instructions should include:
 - Keep your hands clean
 - Cover skin cuts
 - Smoking, eating and drinking in designated areas
 - Notify the farm manager if you have health problems
 - Use suitable protective clothing
 - etc.

- If most of your workers are illiterate, the display should be pictorial.
- Using the display, train all the workers on the topic of general hygiene.
- When visitors and subcontractors come to the farm, ask them to see the display.

HYGIENE

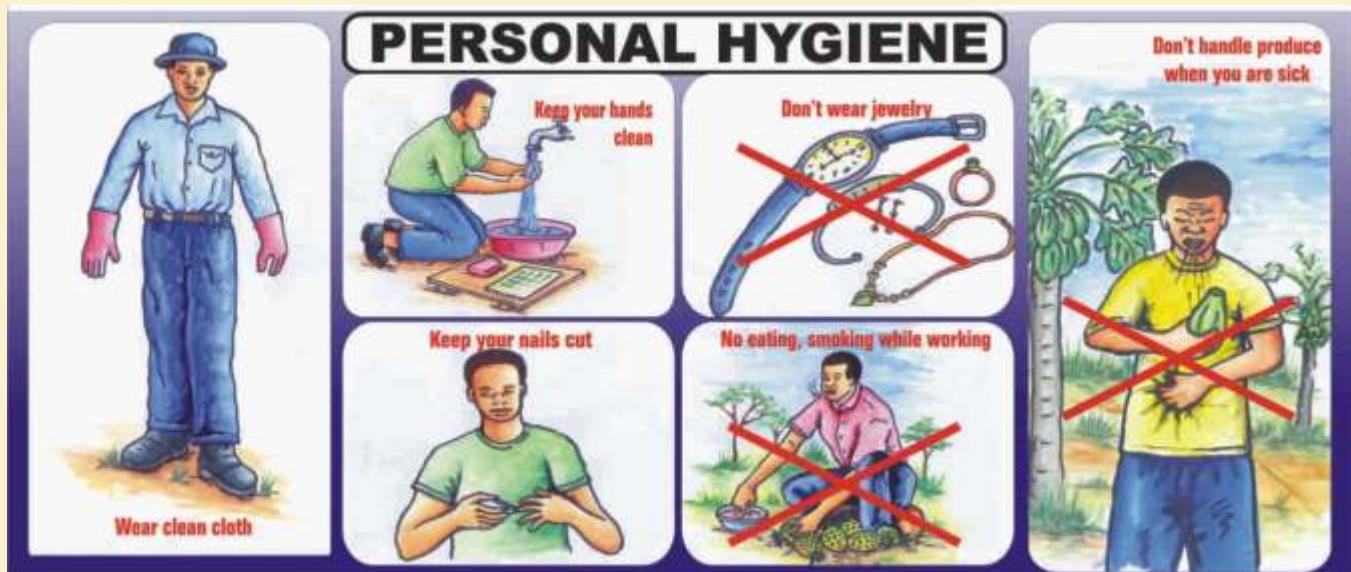
2. Personal hygiene

- Personal hygiene is critical especially at harvesting, because the workers will be in direct contact with the produce.

If they are sick, if their hands are dirty, or if they wear big jewelry, harvested produce could be contaminated or damaged.

All harvest workers need to be trained on hygiene. They should always be reminded of personal hygiene instructions with a display at the farm.

Example of a personal hygiene display



- Personal hygiene instructions should include:
 - Wash hands
 - No big jewelry and watch
 - Keep fingernails short
 - Eating, smoking, drinking at a designated area
 - etc.
- If most of your workers are illiterate, the display should be pictorial.
- Using the display, train all the harvest workers on the topic of personal hygiene.

HYGIENE

3. Harvesting hygiene

- At harvesting, anything that gets into a direct contact with produce should be kept clean.
- **Containers** are kept clean and used only for produce (not for transporting other things).



- **Tools** (knives, scissors, gloves etc.) are kept clean and disinfected.



- **Vehicles** are cleaned regularly.



- **Hands** are kept clean by having access to clean toilets and hand washing facility.



Workers should be able to access a toilet within 500m from their work site or access one with a transport.



Hand washing facility made of a bucket and a tap

HYGIENE

4. Produce handling hygiene

- If you are packing your produce into cartons used for export directly in the field, ensure that packing and storing condition and packaging materials are hygienic. If you are packing your produce at a packhouse, you need to comply with the hygiene requirements at a packhouse.
- Before packing, sort the produce according to a quality criteria.
- Keep the packaging materials at a clean place. Do not store them outside.



- Keep packed produce at a clean place under shade. If you keep them directly on the soil, under the sun or leave them overnight, they could get contaminated and the quality will deteriorate.



Produce on the ground



Produced exposed to the sun



Sheet to keep the produce off the soil



Packed produce kept Under undershade



Produce kept under Shade

MANGO IRRIGATION

Irrigation

Irrigation of newly planted mango trees, especially during dry periods increased the chances of tree establishment and early growth. Newly planted trees should be watered two or three times the first week, then once or twice per week for several weeks.



Irrigation channels of a farm

REASONS TO IRRIGATE

? Irrigation in the first year after planting promotes flushing (and suppresses flowering), so that tree size increase quickly.

? Irrigation also widens the scope for intercropping during the establishment phase.

? During the period of fruit development irrigation increases mango size, earliness and yields.

When the trees are big enough to produce a substantial crop, irrigation should then be stopped or interrupted long enough to impose stress from drought leading to initiation of flowers.

Water requirement

The trees need water during flowering and fruiting stage. Therefore during a dry period of 2-3 weeks the following watering regime can be adopted.

Age of tree	Stage of plant	Amount of water per week
1 - 4 year	Vegetative	Reduced by 10%
	Maturity	
	Harvest	
5 - 6 year	Vegetative	400 Lts
	Maturity	500 Lts
	Harvest	300 Lts
6 - above years	Vegetative	Increased by 10%
	Maturity	
	Harvest	

Avoid over-irrigation during the weeks before harvest, it will decrease produce firmness and increase storage problems. The ideal soil texture for mango cultivation under irrigation is a sandy loam or loam (with a clay content of 15 to 25%).