



GOOD AGRICULTURAL PRACTICES AND SAFE USE OF PESTICIDES FOR CASHEW



Introduction

Good Agricultural Practices (GAPs) is the application of available knowledge to addressing environmental economic and social sustainability for on-farm production and post-production processes resulting in safe and healthy food and non-food agricultural products.

Benefits of good agricultural practices

- Development of basic infrastructure at the farm level
- Build up culture for good agricultural practices by the. Farmers
- Uniform approach across farms regardless of their sizes
- Increased awareness among the farmers as well as the consumers about the need for consumption of good quality and safe food
- Traceability through complete integration of food chain
- Improvement in the environment as well as soil fertility
- Worker's safety and welfare
- Reputation in the international market as a producer of good quality and safe produce
- Removal of Technical Barriers to Trade (TBT) faced by exporters of agro products

GAPs constitute a certification system for agriculture, specifying procedures that must be implemented to produce and supply food that is safe for consumers and wholesome use of sustainable methods.

The Gaps in production includes:

Correct choice of varieties

Cashew has a large number of known and unknown varieties. Grafted varieties are also available in the country. A standard name needs to be documented so that the consumers are not misled. Standard variety name and the origin of produce should be documented for

the marketing of the mango fruits and so that the quality assurance is ascertained.

Good quality planting materials

Seedlings, graft, buddings, and cuttings should be procured from certified sources and it should be specified if these have any special quality with reference to resistance to pests/diseases and nutritional quality. It is a requirement to verify if the orchard is grown from seedlings or vegetative propagated materials for stability in the quality of the produce.

Necessary documentation should be maintained to verify the produce, physically or by any other characteristics. Quality of the scion material for grafting/budding should be known by the grower together with the scion used and its source and qualities. The scion material should be obtained from a recognized/reliable pedigree orchard or source.

Proper site selection

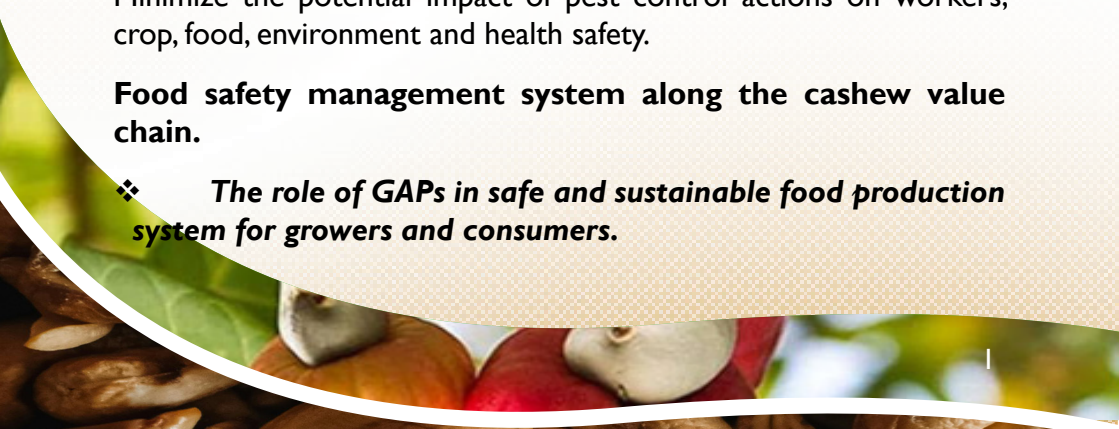
It is a requirement to relate the microclimate of the area, which might affect the productivity, safety and quality of the produce and measures taken to minimize contamination. Site history is an important record, that is taken into account. The land where mango is grown, its soil status, which should be free from any pollutants, /heavy metals/ dangerous chemicals to avoid the mango fruits produced from the field being unsafe environment and exposed to industrial pollutants.

Integrated Pests and Disease Management (IPDM)

Minimize the potential impact of pest control actions on workers, crop, food, environment and health safety.

Food safety management system along the cashew value chain.

❖ ***The role of GAPs in safe and sustainable food production system for growers and consumers.***

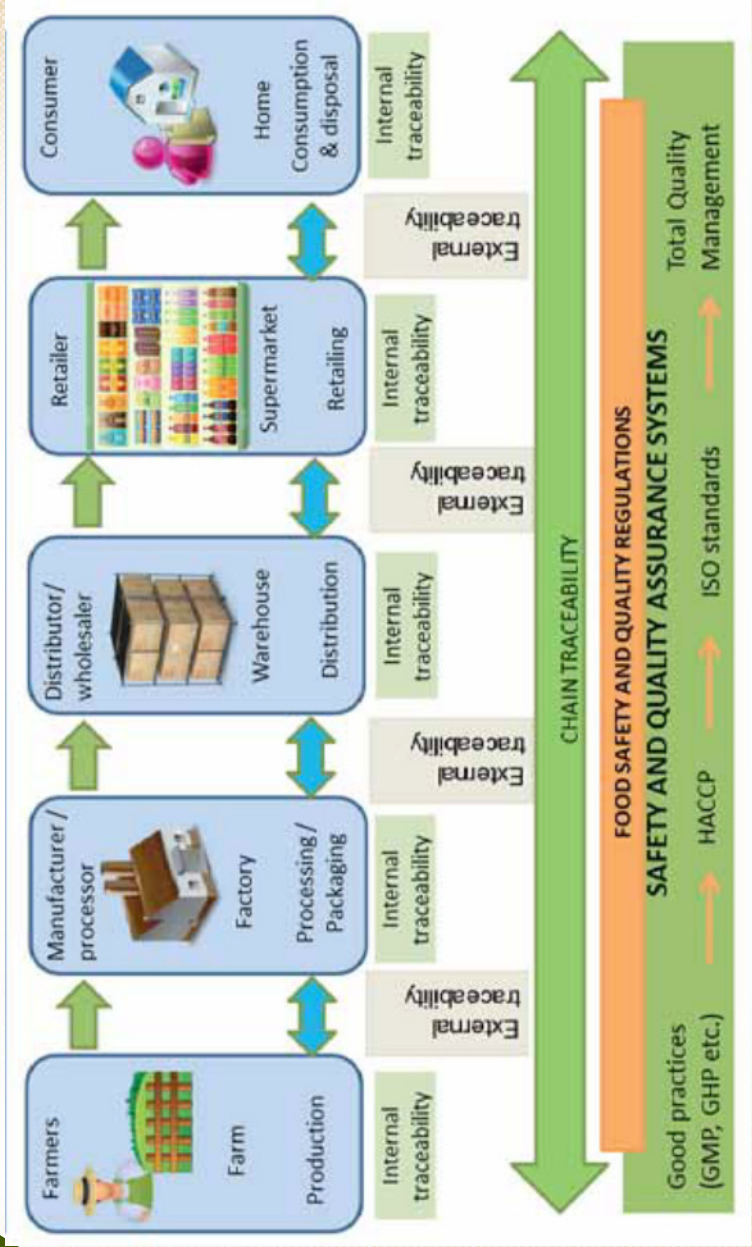


- Producer to ensure cashew planting area does not contain any residual or contamination of hazardous substances that are likely to be of environmental concern or posing health and safety risk.
- Producer to carry out risk assessment through appropriate regulatory authorities to determine suitability of production site if the cashew orchard is located near or in the vicinity of a factory.

❖ ***Mapping and implementing cashew nut traceability as a food safety and quality management practices***

Traceability programs are part of food safety and quality management in cashew value chain

- Ability to access any or all information about a product throughout its life cycle by using a system of recorded identifications
- Need to ensure cashew products can be uniquely traced from the field to the final user
- Record keeping is key for traceability



Traceability process

❖ **Adoption of IPM practices**

Is aimed at minimizing the potential impact of pest control actions on workers, crop, food, environment and health safety.

❖ **Minimizing contamination at harvest, post-harvest handling, at storage, and during processing**

- The crop should be harvested very carefully manually or mechanically as per the recommended practice.
- Facilities should be available for assembling of harvested cashew in a clean shaded place on the farm. Containers should be exclusively used for handling of harvested produce.
- The drying place should be clean and the floor should be washable and need to have a slope to avoid water logging.

❖ **Minimize environmental pollution**

- The containers of empty and obsolete plant protection products should be disposed of according to the applicable laws and procedures and necessary records should be maintained.
- Only approved chemicals should be used. The pesticide used should be duly billed by the dealer and registered in Kenya for application on cashew.

❖ **Promote workers' safety**

- Communications and procedures for workers should be displayed regarding safety.
- Use of protective clothing by workers should be adhered to at all times.
- Training should be given to all workers, operating farm equipment, application of chemicals, use of protective clothing, basic hygiene for handling the produce and first aid treatment.

❖ **Good Agricultural practice standards**

- **Global G.A.P** – A farm assurance program, translating consumer requirements into Good Agricultural Practices. It was developed using the (HACCP) guidelines published by UN – FAO and was adopted from Eurep-GAP.
- **Kenya GAP** - A standard for Good Agricultural Practices in Kenya. It is benchmarked against Global G.A.P.

These standards give specific rules for growers to follow, and independent third party auditors assess each production unit. The certification process involves complying to control points in the following areas:

- ✓ Record Keeping.
- ✓ Site history and soil management.
- ✓ Propagation materials.
- ✓ Irrigation and fertiliser use.
- ✓ Crop protection.
- ✓ Harvesting and produce handling.
- ✓ Workers health, safety and welfare.
- ✓ Waste and pollution management.
- ✓ Environment and conservation.
- ✓ Complaints.
- ✓ Traceability.

❖ **Good Agricultural practices audits**

Good Agricultural Practices (GAP) audits are voluntary audits that verify that nuts have been produced, packed, handled, and stored to minimize risks of microbial food safety hazards. This is done using the Global G.A.P and Kenya GAP standards.

Safe use of Pesticides

Why Safe Use?

- Serious illnesses and health issues are linked to pesticides.
- People are exposed to dangerous levels of pesticides from farmers to babies drinking their mother's contaminated breast milk.
- Reductions in pest populations upset the complex balance between predator and prey species in the food chain.
- Pesticides decrease biodiversity of soils and contribute to nitrogen fixation, which leads to decline in crop yields.
- W H O and the UNEP estimate that 3 million workers in agriculture in the developing world experience severe poisoning from pesticides, and 18,000 of them die.
- 99% of pesticide related deaths occur in developing countries although they use only 25% of all pesticide used worldwide.
- 25 million workers in same countries may suffer mild pesticide poisoning yearly.

Toxicity

A toxic substance is any substance which is harmful to the environment and humans. There are naturally occurring toxins and synthetic toxins.

Natural Toxins

- Poisonous plants.
- Snakes.
- Other poisonous animals.

Synthetic Toxins

- Pesticides.
- Industrial chemicals.
- Household products.

Types of Pesticide Toxicity

- Acute – usually immediate, obvious, reversible.
- Delayed – “chronic”, usually from repeated doses.
- Allergic – immune system response to chemicals.

Formulations

- Emulsifiable Concentrates.
- Wettable Powders.
- Oil Solutions.
- Fogging Concentrates.
- Dusts.
- Aerosols.
- Granular.
- Fumigants.
- Impregnated materials.
- Baits.

**High toxicity,
Low exposure risk**



**Low toxicity,
High exposure
risk**

Exposure through the skin

- Occurs in 90% of cases worldwide.
- Concentrates penetrates skin more rapidly than water mixtures.
- Hands, arms and feet – the most likely contact zones.
- Wetable powders, granules or dusts less readily absorbed but sweat enhances skin penetration.

- Handling, decanting, mixing concentrates exposes operators to higher risk than actual application.
- Degree of hazard depends on dermal toxicity, extent of exposure, amount of body surface exposed, and part of the body exposed (eye versus palm).
- Time between exposure and decontamination.

Exposure through inhalation

- Through spray droplets or dust. Can cause damage to nose, throat and lung tissues.
- Vapours and aerosols with droplet sizes below 10 microns would reach lungs, 50-100 microns' impact on the nasal lining.
- Higher risk when working in enclosed spaces, aerosol sprays in green houses, living and bed rooms, or when transferring volatile compound from one container to another.
- Product with fumigant action.

Exposure through mouth

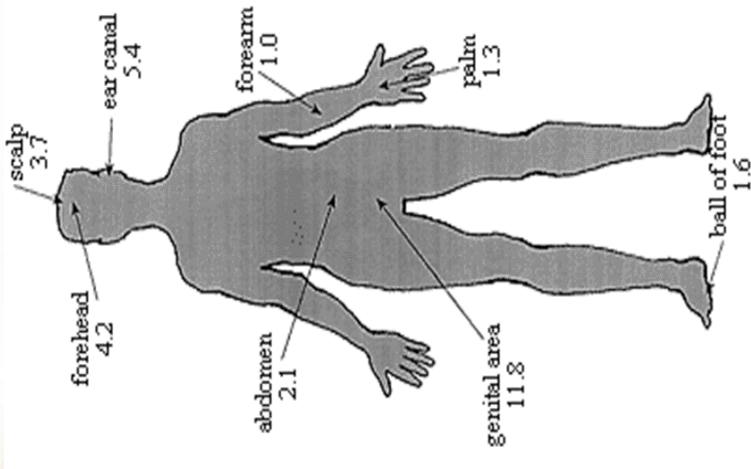
Less common in practice but serious consequences

Occurs when:

- Smoking, eating or drinking when mixing pesticides.
- Attempt to wipe off sweat from face with contaminated hand.
- Clearing spray nozzle by blowing them.
- Accidentally touching the skin around the mouth when removing respirator or nose mask.
- Accidental contamination of foodstuff occurs during transportation.

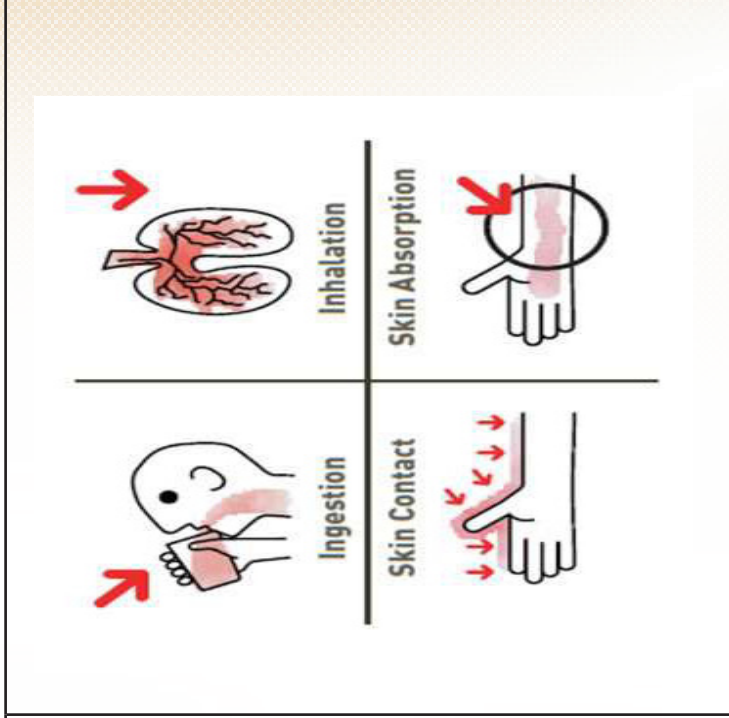
How Much Pesticide Enters the Body?

Anatomy	% Absorption
Forearm	8.6
Palm of hand	11.8
Ball of foot	13.5
Abdomen	18.4
Scalp	32.1
Forehead	36.3
Ear canal	46.5
Scrotum	100.0



When Does Exposure Occur

- 80-85% exposure during mixing and loading concentrate
- 15-20% during field application
- Dermal exposure:90-100% of the total exposure (70% on the hands and forearms
- Inhalation: 0.1% exposure Powder increases the risk of exposure
- Exposure Occurs when empty bags/ containers are burned



Pesticide Information

- All pesticide information is contained in the Label.
- The label is found on or attached to container.
- Primary source of information to user.
- Describes risks and benefits of the product.
- Tells how to use product safely and correctly.
- Primary tool of pesticide regulation.
- The label plus other manufacturer information must be approved and registered by PCPB and AAK.

Read the Label

Reading the label is the most valuable few minutes you can spend in pest control

This small investment of time helps avoid injuring;

- yourself
- others
- or the environment
- by misusing the pesticide

Signal Words

- **DANGER*** - highly toxic
- **WARNING** – moderately toxic
- **CAUTION** – slightly toxic
- *with skull/crossbones/POISON = acute illness
- *without skull/crossbones/POISON = skin/eye irritation potential



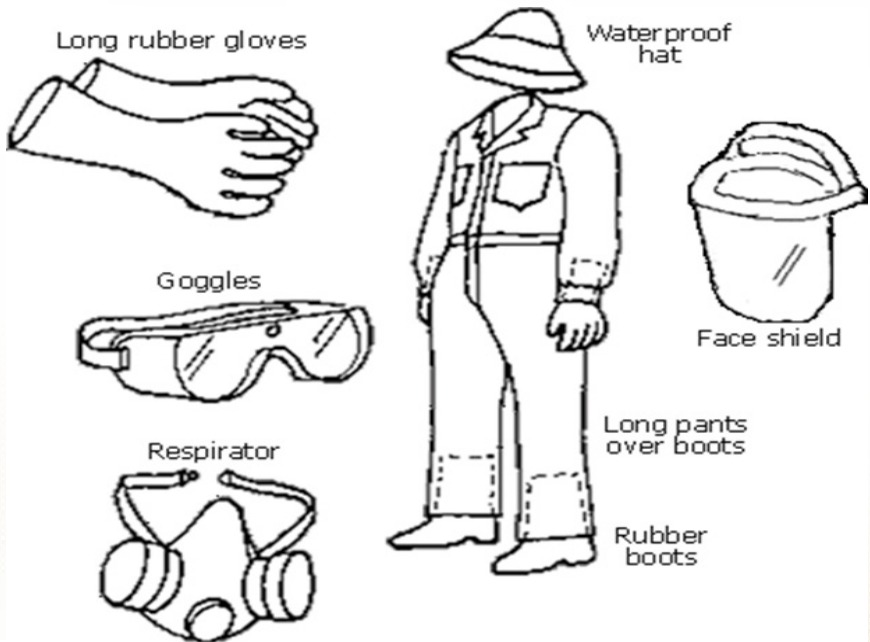
Hazard warning symbol (can cause death / danger sign)

Signal Words

Category	Signal word required on label	Approximate amount needed to kill an average person
Highly Toxic	1 DANGER POISON	A few drops to one teaspoon
Moderately toxic	2 WARNING	One to 2 teaspoons
Slightly toxic	3 CAUTION	Over 2 teaspoons
Not toxic	NOT RE- QUIRED	

Points to remember

- Use pesticides only when necessary.
- Use appropriate pesticide for the crop.
- Use appropriate and well calibrated equipment.
- Observe the prescribed pre-harvest intervals (PHI).
- Correct dosage and correct application.
- Proper handling –storage, transportation
- Ensure safe disposal.
- Record keeping.
- Use of personal protective equipment.



Recommended protective clothing



For more Information, Contact:
The Institute Director

Industrial Crops Research Institute

P.O Box 16-80109, Mtwapa

E-mail: director.icri@kalro.org

Compiled by:

Pole F.N., Muniu F.K, Menza M., Mwashumbe S., Lewa K.K. and Nekesa C.

Editors: Nyabundi K.W., Mukundi K.T., Maina P., Wanyama H.N., Kedemi R.M. and Biegon A. K.

Design: Odipo S.N.

KALRO/NAVCDP/CASHEW/Pamphlet No...../2024

