

POST HARVEST ISSUES & CERTIFICATION

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INTRODUCTION

- In Agriculture, post harvest is the stage of crop production immediately following harvest, including cooling, cleaning, sorting and packing. The instant a crop is removed from the ground, or separated from its parent plant, it begins to deteriorate.

HARVESTING EQUIPMENT

- Knives, clippers, shears, reaping poles and all other equipment used for harvesting must:
 - be maintained in good working condition
 - be sharp to provide clean cuts
 - be stored in appropriate area so as to prevent contamination
 - be designated for the sole purpose
 - be cleaned and sanitized after use
 - be sanitized before use

PERSONNEL

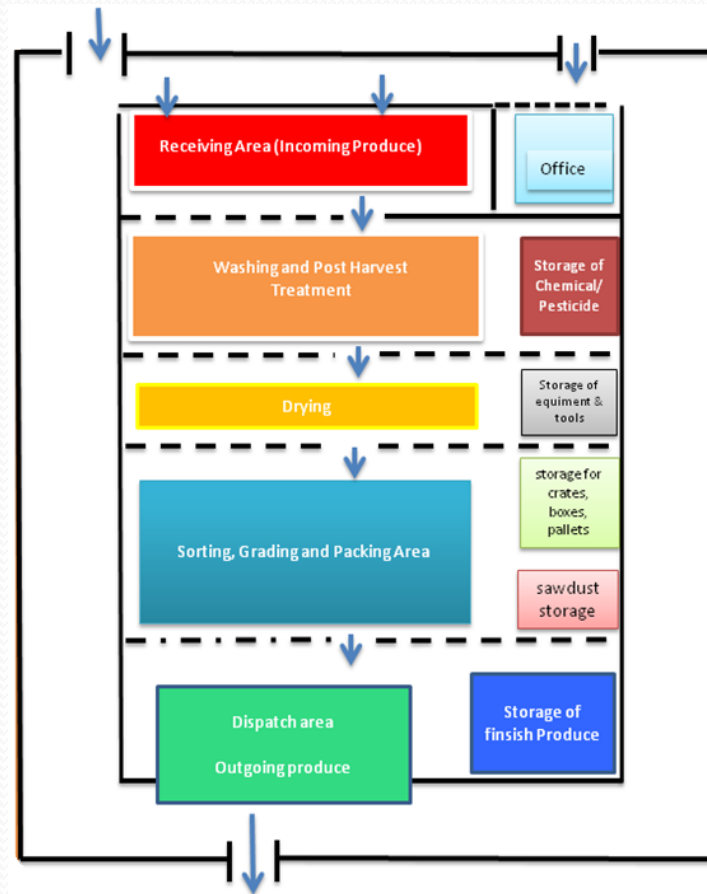
- All workers must adhere to good personal hygiene practices
 - Frequent, thorough and proper hand washing
 - Frequent baths
 - Changing of clothes
 - Cleaning of teeth
 - Washing of hair
 - Manicure
 - General grooming

Must dress so as to protect self and protect produce from contact with body or body fluids (sweat, saliva, etc.)

FACILITY

- Must be of sound construct
- Designed to facilitate easy and complete cleaning and sanitizing
- Designed to prevent the entry of rodents vermin, etc.
- Designed to facilitate easy loading and offloading of produce
- Designed to prevent cross-contamination of produce (unidirectional flow preferred)

Unidirectional flow



FACILITY CONT'D

- Equipped with proper fixtures for:
 - sorting
 - selection
 - separation
 - cleaning
 - drying
 - grading
 - packing
 - storing

HOLDING CONTAINERS

- Produce crates:
 - Made of sturdy material; preferably food grade plastic
 - Do not facilitate chipping, splintering and peeling
 - Facilitate adequate cleaning and sanitizing



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RESPIRATION

- All fruits, vegetables and root crops are living biological organisms that respire and continue their living processes after harvest
- Categorize based on respiration rate:
 - Low: nuts, dates, apples, garlic, onion, sweet potato
 - Moderate: banana, carrots, cabbage, pepper
 - High: cauliflower, avocado escallion
 - Extremely high: broccoli, peas, sweet corn, spinach

ETHYLENE

- Ethylene is a natural product of plant metabolism and is produced by all tissues in higher plants. It is considered the natural aging and ripening hormone and is active even at small traces
- Categorize based on ethylene production
 - Low: cauliflower, root vegetables, potatoes, pepper
 - Moderate: banana, mango, plantain, tomato, honey dew melon
 - High and very high: apples, avocados, cantaloupe, papaya

WATER

- Fruits, Vegetables and root crops contain 65 to 95 percent water
- Post-harvest life depends to a great extent on the rate at which stored food is used up and their rate of water loss.
- When food and water reserves are exhausted, the produce dies and decays.
- Controlling relative humidity at appropriate levels can greatly reduce water loss

RELATIVE HUMIDITY

- Proper relative humidity should be:
 - 85-95% for the majority of the fruits
 - 95-98% for vegetables
 - 70-75% for dry onions and pumpkins
 - 95-100% for most root vegetables

TEMPERATURE

- Temperature management is the most important tool we have to extend the shelf life of fresh produce after harvesting
- The rapid removal of field heat from the commodity is the beginning of temperature management and should begin as quickly as possible after harvesting

POST HARVEST ISSUES

- Do not harvest in the heat of the sun
- Do not transport in condition of high temperature
- Do not harvest wet or water soaked produce
- Do not harvest before recommended pesticide withdrawal period
- Harvest at correct stage of maturity
- Handle produce with due care

YAMS

- Select tubers harvested at the correct stage of maturity
 - Maximum two inches of white at the tip (toe end)
 - Does not yield to twisting or pressure
 - Skin hold fast, does not peel away with slight rub
- Maximum of three toes
- Maximum of three cut surfaces

YAMS cont'd.

- Inspect tubers for freshness, cuts, bruises, pest damage, earth cracks and other deformities
- Wash tubers in potable water containing 50-200 ppm residual chlorine
- Trim tubers, making only clean cuts; no jagged edges nor V's
- Immediately dip in postharvest fungicide, ensuring correct type and concentration (EPA, FDA)
 - Botran (dicloran) for USA and Canada
 - Mertec (thiabendazole) for UK

YAMS cont'd.

- Place tubers on drying racks to air dry in well ventilated area
- Pack into boxes only after cut surfaces form adequate crust and tubers are completely void of surface moisture
- Ensure adequate cushioning:-
 - Paper (not newspaper)
 - Coir dust/fiber
 - Saw dust/wood shavings

YAMS cont'd.

Drying tubers



YAMS cont'd.

Packing tubers



YAMS cont'd.

- Cover and secure with tape
- Label and stack on pallets (reduce handling)



YAMS cont'd.

Pests of concern

- Yam Weevil (*Palaeopus costicollis*) and Nematode
- Blue and Black Mold

Yam Weevil Larva



YAMS cont'd.

Inspection and Fumigation



YAMS cont'd.

Fumigation



YAMS cont'd.

Fumigation and Inspection



YAMS cont'd.

Loading



PEPPERS

Considerations

- Field inspection (irrigation method, water source, mulching/manure)
- Pests presence
- Pesticide use (approved for market, withdrawal period)
- Time of harvest
- Packaging and Transport (from field)

PEPPERS cont'd.

Pests of concern

- Gall Midge (*Contarinia lycopersici*)
- Corn Ear Worm (*Helicoverpa sp*)
- Mealy Bugs
- Pepper Weevil (*Anthonomus eugenii*)

PEPPERS cont'd.

Pests of concern

- Corn Ear Worm (*Helicoverpa sp.*)



PEPPER cont'd.

Pests of concern

- Pepper Weevil



Kim Davis & Mike Stangeland * <http://kimandmikeontheroad.com>

PEPPERS cont'd.

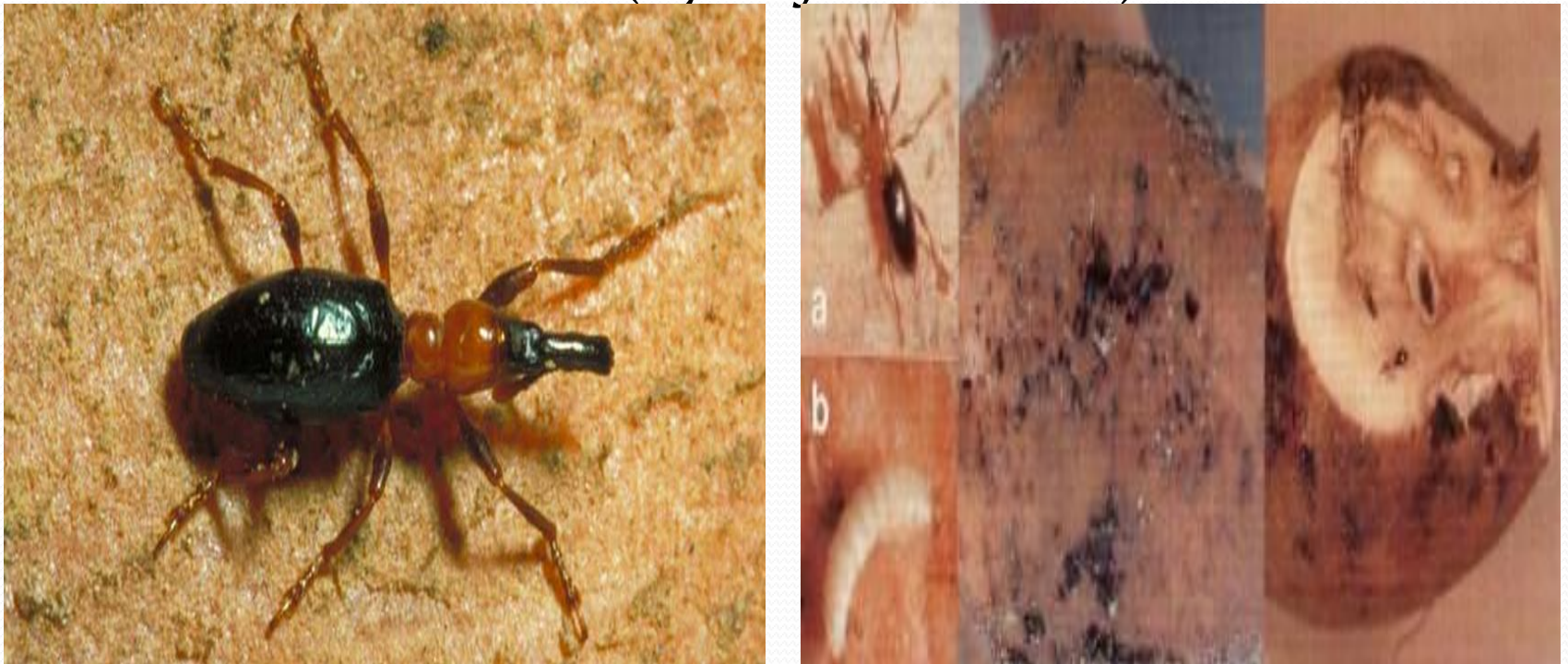
Sorting and Selection



SWEET POTATO

Pest of concern

- Sweet Potato Weevil (*Cylas formicarius*)



SWEET POTATO cont'd.

- Sorting, selection, packaging



CERTIFICATION

- Packing House certification
- Appointment for inspection
- Document verification
- Inspection; inspect for:-
 - Pests (to include diseases)
 - Quality
 - Packaging and labelling
- Document certification