Reference: - eagri.org

TOOLS USED FOR HORTICULTURAL CROPS

➢ GRAFTING

In most cases, one plant is selected for its roots, and this is called the **stock** or rootstock. The other plant is selected for its stems, leaves, flowers, or fruits and is called the **scion.**

- **BUDDING**

It is a grafting technique in which a single bud from the desired scion is used rather than an entire scion containing many buds.

TOOLS USED FOR BUDDING AND GRAFTING

1. Dibber (Overall length 27cm, weight 290g)
2. Budding and grafting knives
3. Grafting Tools
4. Grafting Tape
5. Pruning and Lopping Shears

Pruning shears Recommended Cutting Capacity up to 2 cm, length 18 cm and weight 200 gm

TRANSPLANTERS (FOR HORTICULTURAL CROPS)

- Relative difficulty in transplanting various vegetables

Easy to transplant	Medium difficulty	Difficult to transplant
Broccoli sprouts	Cauliflower	Watermelon
Brussels	Celery	Muskmelon
Cabbage	Egg plant	Squash
Tomato	Onion	Cucumber
Lettuce	Pepper	

NURSERY STOCK VEGETABLE TRANSPLANTERS

- They can Plant at spacing as close as 5-8 cm in the row.

- Planters are available to plant 2-6 rows at a time with 15-20 cm row spacing.

TRACTOR OPERATED POST HOLE DIGGER

- Holes of diameter 15 to 100 cm and depth 09 to 100 cm can be made by using appropriate augers.

ENGINE OPERATED POST HOLE DIGGER (MANUAL HANDLING)

- Two-man auger is powered by a 4 cycle, 5 hp engine.
- The auger can make holes from 5 to 20 cm in diameter and depth up to 75 cm There is an optional 45 cm extension available.

CITRUS HARVESTER

Two types of mechanical harvesters are being used today for harvesting citrus

a) Continuous canopy shake system
b) Trunk shake system. Shake and catch system

- The drum can harvest up to 18 feet of canopy height.
- To minimize fruit splitting from impact with the ground or catch frame, trees should be topped to a maximum of 16 to 18 feet.

SELF-PROPELLED HARVESTING UNITS- CITRUS HARVESTER

- The paired units travel down the tree row at ground speeds that can vary from 0.5 to 1.3 miles per hour, thus allowing 200 to 400 trees per hour to be harvested.
- The goat-type trucks are similar to a conventional harvesting goat but slightly larger with a capacity of between 130 and 150 boxes.
- Tree topping height should not exceed 16 to 18 feet and trees should have a canopy width from the tree trunk to the outer canopy of 6.5 to 8 feet.
- Under grove conditions outlined above, continuous shake and catch systems typically deliver 90 to 95% of the available fruit to the semi trailer. With gleaning crews, total fruit recovery approaches 98%.
- A self-propelled continuous canopy shakes and catch system uses a crew of six workers - 2 harvester operators and 4 goat drivers. Overall, harvest labor productivity improves from 5 to 10 times over a hand crew, depending on grove conditions and equipment downtime.

THE TRACTOR-DRAWN CANOPY SHAKE SYSTEM- CITRUS HARVESTER

- The harvester can travel between one-half and one mile per hour and have the capacity to harvest between 100 and 200 trees per hour.
- The above systems can reduce harvesting costs by 20 to 40 cents per box.

TRACTOR OPERATED TURMERIC HARVESTER

- The blade is fixed at an inclination of 20° to a cultivator frame with straight tynes at both ends for easy penetration in to the soil.
- The field capacity of the unit is 1.6 ha per day.
- Results in 70 per cent saving in cost and 90 per cent in time when compared to manual digging.
- Extent of damage caused to the rhizomes is very much less (2.83 per cent)
- The un dug rhizomes left in the field is minimum (2.42 percent)

POWER TILLER OPERATED POTATO DIGGER

- The depth can be adjusted to set the depth up to 30 cm. The field capacity is 0.4 ha/day.
- Digging with power tiller drawn potato digger results in 47.7 per cent of saving in cost and 68.0 per cent of saving in time when compared to manual digging

Chisel Plough:

- The main function of this plough is to loosen and aerate the soils while leaving crop residue at the top of the soil.
- The chisel plough is typically set to run up to a depth of 300 to 400 mm. However, some models may run much deeper.
- Each of the individual ploughs, or shanks are typically set from 230 mm to 305 mm apart.
- When planning to plough with a chisel plough it is important to bear in mind that 10 to 15 horsepower (7 to 11 kw) per shanks will be required.
- It can efficiently work up to 60-70 cm depth.