

Maturity Indices and Method of Harvesting of Vegetable Crops for Quality Seed Production

V. M. Chaudhari and D. C. Barot

Ph.D. Scholar at ASPEE College of Horticulture, Navsari Agricultural University, Navsari

*Corresponding Author: vishalmansung2121@gmail.com

The principles dictating at which stage of maturity a vegetable should be harvested are crucial to its subsequent storage life and quality. Post harvest physiologist distinguishes three stages in life span of vegetables: maturation, ripening and senescence.

Maturation of seed

There are two maturation stages in seed

1. Physiological maturation

Utmost accumulation of dry substance in seed is reported in this stage. The moisture present in the seed at this stage will be in declining order (25-30%) and is expressed with utmost dry weight of seed, germination and vigour potential, respectively. The physiological maturation is corresponded for individual seed and this maturation will not be the identical for the population, due to differential flowering habits (Malarkodi and srinathi, 2007).

2. Harvestable maturation

Whole population achievement of 80% physiological maturity is considered as the harvestable maturity. At this stage seed contain less moisture content than the physiological maturation (18-20%). Normally, harvesting of the seed crops done at harvestable maturity stage for getting high quality seed (Elias and Copeland, 2001).

Harvesting

Usually, the crop harvested at harvestable maturity will have the greater seed yield than the physiological maturity. In crops the maturation will not be always homogeneous but there will be mingling of matured, immature and over matured

based on the time of anthesis and fertilization. Hence finest time of harvest for a given seed crop is essential as beyond the point losses will be lesser than the potential seed yield. Hot dry weather greatly increases the rate of natural seed drying on the plant. Seed moisture can form the most vital sign of a crop's fitness for harvesting.

Vegetable seed crops are divided into three groups depending on the state of seed at harvest time (Rashid and Singh, 2000).

a. Dry seed

Before harvesting the seed is dried on the plant. e.g. okra, brassicas, lettuce, peas, beans, beet and onion.

b. Fleshy fruits

First of all ripened fruit are harvested from the plant and kept for drying, then after dried seed are collected from the fruits. e.g. chillies, ribbed gourds and bottle gourd.

c. Wet fleshy fruits

In these types of fruits containing a high level of moisture due to the seed has a gelatinous or mucilaginous coating adhering to it. This has to be detached after seed extraction by a fermentation process or treatment with dilute acids. (e.g. tomato, brinjal, cucumbers and pumpkins).

Method of Harvesting

The seed or fruit are harvested by manually or mechanically, depending upon the size of production, cost and accessibility of skilled labour and or of appropriate harvesting machines (McCormack, 2004).

Crops	Maturity indices
Dried seed	
Amaranthus	Inflorescence is converted yellowish brown.
Onion	Dark black colored of seed with silver-colored capsules.
Carrot	3 rd umbel turn brown and 2 nd umbel are fully dried.
Radish	Pod converted in to brown color.
Turnip	Brown and parchment like color developed in plant.
Coriander	Whole plant started to show light yellow to brown color.
peas	Pod become parchment like.
Beans	Earliest developed pod is dried and remaining are turned yellow.
Wet fleshy fruits	
Brinjal	Fruit turn to yellow to brown in colour.
Tomato	Firmness of fruit is reduced and skin of fruit converted dark red in colour.
Cucumber	Fruit converted yellowish to brown in colour, stalk adjacent to the fruit withers for compliant actual seed maturity.
Watermelon	Tendrils wither on fruit bearing shoots, fruit skin colour near to the soil is pale yellow and give dull sound on thumping.
Pumpkin	Rind becomes hard and fruit converted into orange or golden colour.
True potato Seed	Berries become soft and converted in to green to straw colored.
Bitter gourd	Fruit become soft and converted in to red colour.
Fruit dried before extraction	
Chillies	Fruit colour change into yellowish red.
Bottle and Sponge gourd	Rind become hard colour change to light brown to yellow

(Source: Geetha Rani, 2006)

1. Hand picking

Seeds of some crops like solanaceous fruits (brinjal, pepper, tomato), cucurbits and sweet corn

are conveniently harvested by picking fruits by manually. The tiny seeded fruits or seed heads of vegetable crops like onion, carrot, okra or chilli can be cut with a knife or secateurs. Frequently it is suitable to cut off the whole plant with a sickle, as in the case of lettuce, chicory, brassicas, radish and peas. The legumes are, however, usually harvested by pulling up the whole plant and then threshed to recover the seed (e.g. peas and beans). Although hand harvesting methods are labour intensive, they allow plants to be harvested individually or even at several stages of crop growth. Manual harvesting provides more protection and the maximum potential seed yield per unit area, when compared with the mechanical harvesting. In plants requiring after ripening, the larger the plant part are cut and removed with the ripening seed results in higher seed yield (e.g. the small seeded vegetable crops like lettuce and brassicas.)

2. Mechanical harvesting

Vegetable seed crop may be harvested by employing a suitable mechanical harvester, especially in the large-scale commercial seed producing farms where the manual labour is costly. In the mechanical harvesting, cutting and threshing operations may be carried out by two separate machines or both the operations may be performed by a single combined machine. The cutting operations can be mechanized, using mowing, windrowing machines, which are most conveniently used for crops like peas, beans, spinach, carrot and brassicas.

References

Elias, S. G. and Copeland, L. O. (2001). Physiological and harvest maturity of canola in relation to seed quality. *Agron. J.*, 93:1054–1058.

- | | |
|---|--|
| <p>Geetha Rani, P. (2006). <i>"Seed production of vegetable, tuber and spice crops"</i>. TNAU, Coimbatore, pp. 193-194.</p> <p>Malarkodi, K. and Srimathi, P. (2007). Seed physiological maturity. <i>Int. J. Pl. Sci.</i>, 2(1): 222-230.</p> | <p>McCormack, J. H. (2004). <i>"Seed processing and storage"</i>. Sustainable Agriculture Research and Education, pp. 1-3.</p> <p>Rashid, M. A. and Singh, D. P. (2000). <i>"Manual on vegetable seed productions in Bangladesh"</i>. Horticulture Research Centre, BARI, Bangladesh, pp. 105-106.</p> |
|---|--|

* * * * *