

Study on Physiological Maturity in Muskmelon (*Cucumis melo* L.)

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Studies on the effect of harvesting maturity on seeds are made principally to determine the optimum time for recovery of good quality seeds. Harvesting at optimum stage not only minimizes the loss of viability and vigour of seeds but also prevents the seeds from field damage due to insect, pests and diseases and adverse environmental conditions. Since the seed yield and quality largely depend upon the stage of maturity, hence, there is a need to standardize the stage of harvesting for getting higher seed yield with better quality attributes. In muskmelon hybrid, Punjab Anmol, studies on the influence of maturity stages on the seed quality are very scant and hence, the present investigations were undertaken to understand the maturation of seeds, so that the fruits can be harvested at right time to get better quality seeds.

The experiment was conducted at KVK, Fatehgarh Sahib where the soil of the experimental area was clay-loam and categorized under heavy soil, which is considered favourable for melon cultivation. The crop was sown during the second fortnight of March 2007. During flowering, the newly opened flowers were tagged as and when they opened. The fruit set from the tagged flowers was harvested at six stages starting from 21 days after flowering (DAF) to 56 DAF at weekly intervals. Since, the fruit colour serves as an effective visual morphological index for physiological maturity, therefore, the days after flowering were also correlated with

fruit colour. Hence, the fruits were accordingly classified into six categories depending on fruit colour: i) green, ii) half yellow, iii) yellow, iv) yellow orange, v) light orange and vi) orange, respectively. A sample of ten fruits was drawn at random from each maturity group and the seeds were extracted separately from each fruit. The seeds thus extracted, were subjected to laboratory tests at Seed Technology Centre, PAU, Ludhiana. The seed quality parameters viz. per cent germination, fresh and dry weight of the seedlings, root length, shoot length, vigour index and 100-seed weight, were recorded. The laboratory germination test was conducted and observations were recorded as per ISTA [1]. Twenty-five normal seedlings from each replication were selected at random and were subjected to reckon seedling vigour index (VI) on the basis of seedling length as per procedure prescribed by Abdul Baki and Anderson [2]. The data recorded on various characters was analyzed by adopting RBD with three replications.

In the present study, significant differences were observed among the different harvesting stages with respect to the quality parameters (Table 1). All the quality parameters tested were found to increase as the stage of harvesting advances from first to third stage and decreased significantly when the harvesting was further delayed. It was observed that fruits harvested at yellow colour stage (35 DAF) recorded the highest germination (66%), fresh (1.56g) and dry

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Table 1. Influence of harvesting stages on quality parameters in muskmelon cultivar Pb. Anmol

Harvesting stage (DAF) and fruit colour	100-seed wt.(g)	Germ (%)	Root length (cm)	Shoot length (cm)	Vigor index	Fresh wt(g)	Dry wt. (g)
21 (Green)	1.68	61.0	11.50	8.30	1207.8	1.10	0.070
28 (Half yellow)	1.75	62.0	11.64	8.36	1240.0	1.14	0.072
35 (Yellow)	1.91	66.0	12.47	9.51	1450.7	1.56	0.081
42 (Yellow orange)	1.52	42.0	11.19	9.36	863.1	0.69	0.057
49 (Light orange)	1.42	38.0	10.43	9.25	747.84	0.65	0.050
56 (Orange)	1.40	32.0	10.34	8.65	607.68	0.52	0.042
CD (5%)	0.036	1.52	0.020	0.019	274.16	0.446	0.023

(.081g) weight of the seedlings as compared to fruits harvested at early or late stage of maturity. 100 seed weight is considered as an important parameter that determines the quality of a seed lot. The seeds obtained from fruits of early stages of harvesting were poor, immature and under-developed [3] which is evident by lower seed test weight values in the present study. The fresh weight of seed was maximum at 35 DAF (1.91g) and then it decreased gradually. The higher 100-seed weight at 35 days after flowering could be due to further accumulation of photosynthetates in seed. Similarly, root (12.47 cm) and shoot (9.51 cm) length and vigour index (1450.7) was also highest at yellow colour stage which indicated that seeds put up maximum dry weight and possess maximum viability and vigour at the stage of physiological maturity.

The higher values of seed/seedling quality parameters in yellow coloured ripened fruits are indicative of the physiological maturity of the fruit. Physiologically mature seeds are completely developed with maximum accumulation of food reserves from source to sink with completion of biochemical processes. Similar results in brinjal [4] further corroborate the present findings where maximum values of seed quality parameters were observed at yellow colour maturity stage. The findings of Nandeesh *et al.* [5] in cucumber, Naik *et al.* [6] in capsicum and Tirakanranavar *et al.*

[7] in bitter gourd also support the results of the study.

The inferior quality at further picking stages; when the colour of fruit changes from yellow-orange to orange, may be due to high respiration and field damages as a result of delayed harvest. Similar findings were also reported by Nerson in cucumber [8] and by Alvarenga *et al.* [9] in watermelon. Furthermore, there was a considerable reduction in the seed weight with delayed harvesting. Earlier reports [10, 11] also indicated that in muskmelon fruits, seeds are either dead or had very low vigour if the harvest was delayed.

Thus, from this study, it can be concluded that fruits of muskmelon hybrid, Punjab Anmol, may be harvested at 35 DAF i.e. when they turn yellow in colour, as the seeds at this stage recorded better quality parameters than the rest.

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