

Time of harvest and seed quality of chilli (*Capsicum annuum*) [Masa pemetikan dan mutu biji cili (*Capsicum annuum*)]

A. A. Zainol* and A. W. Jamaidah**

Key words : chilli seed production, vigour testing, harvest cycle

Abstrak

Mutu biji benih cili mengikut kitaran pemetikan dikaji. Teknik pencepatan usia digunakan untuk menentukan kecergasan biji benih cili daripada dua kitaran pemetikan. Keputusan menunjukkan bahawa biji benih daripada buah-buah masak yang dipetik dalam kitaran yang pertama lebih cergas berbanding dengan biji benih daripada kitaran yang kedua. Suhu yang digunakan dalam teknik pencepatan usia ialah 47 °C.

Abstract

Accelerated aging technique was used to determine the vigour of chilli seeds from two cycles of harvest. Result indicated that chilli seeds obtained from ripened fruit of the first cycle were more vigorous than those from the second cycle of harvest. The temperature used in the accelerated aging technique was 47 °C.

Introduction

Capsicum annuum or chilli is an essential ingredient in Malaysian cooking. Though chilli is a perennial, it is usually planted as an annual (Purseglove 1968). Fruit are normally harvested 2-3 months after transplanting. The fruit can be harvested once or twice weekly (Purseglove 1968; Tan 1973). Ong and Ramlah (1982) reported two cycles (possibly more) of flowering and the subsequent fruiting. In the first cycle, fruit could be harvested 8-11 weeks after transplanting followed by a 6-week barren period and a second cycle of harvest which lasted for another 3 weeks. They also found that fruit harvested in the second cycle were smaller than those of the first cycle. Greensill (1964) also reported two rounds of harvesting in sweet pepper.

This study was conducted to determine whether seeds obtained from these two

cycles of harvest are of similar quality in terms of germinability and seed vigour.

Materials and methods

Two chilli seeds (cv. MC 4) were sown directly into each polythene bag measuring 10 cm x 15 cm and filled with potting mixture consisting of three parts soil, two parts cow manure and one part sand. The bags were watered twice daily. A week after emergence, the plants were thinned to 1 plant/bag. Three weeks after sowing, NPK fertilizer (12:12:17) was given at a rate of 7 g/L of potting mixture. The 1-month-old seedlings were transplanted into the field at a planting distance of 80 cm x 60 cm apart. Normal agronomic practices for chilli production were carried out (Leong et al. 1985).

At flowering, three sets of 20 plants were randomly selected from the planting

*Basic Research Division, MARDI, P.O. Box 12301, 50774 Kuala Lumpur, Malaysia

**Cocoa/Coconut Research Division, MARDI, Hilir Perak, P.O. Box 25, 36307 Sungai Sumun, Malaysia

Authors' full names: Zainol Abd. Aziz and Jamaidah Abd. Wahab

©Malaysian Agricultural Research and Development Institute 1991

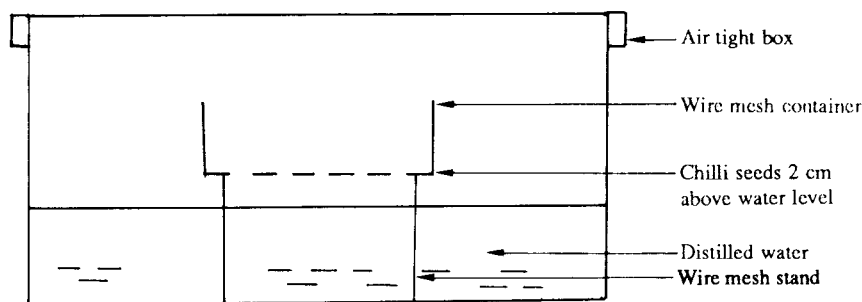


Figure 1. A general set up for the accelerated ageing technique imposed on chilli seeds to study the seed vigour

Table 1. Mean yield and dry seed weight of chilli (MC 4)

Harvest cycle*	Fruit no.	Fresh fruit wt. (g)	Dry seed wt. (g)
1	7.72	71.95	3.83
2	4.55	28.88	1.38
LSD 0.05	3.17*	41.32	2.39

*Each harvest cycle lasted for 6 weeks with a barren period of 10 weeks between the two harvest cycles

*Not significant

rows. The fully ripened fruit were picked from each set to form the main samples. The seeds were extracted from each set separately, washed and dried in the oven at 40 °C until the seed moisture content was 7–8%. The dried seeds were placed in polyethylene bags and stored in an air-conditioned room at about 22 °C. The seeds from the two cycles of harvest were stored for 1 month before being tested.

Accelerated ageing technique and germination test

Using the soil divider method (Anon. 1985), five samples were drawn from each of the three main samples for each harvest cycle. These samples were again subdivided into two subsamples which were then placed separately in a wire mesh container. One of the subsamples of each sample was then placed about 2 cm above water level in air-tight plastic boxes (Figure 1). The plastic

boxes were placed in an aerated oven at 47 °C.

The other subsamples, used as 'unaged seed', were also placed in similar air-tight boxes minus the water and placed in an air-conditioned storage room at about 22 °C.

At 2-day intervals, the subsamples of both treatments were taken from the plastic boxes and tested for germination (Anon. 1985).

Results and discussion

The fruit were harvested at about 3 months after planting. The first and second harvest cycles lasted for 6 weeks each. The barren period between the two harvest cycles was 10 weeks. Mean number of fruit per plant per week collected for the first and second cycle was 7.7 and 4.6 respectively. There was no significant difference in terms of fruit number between the two harvests but there was a significant difference between

Table 2. Germination of unaged and aged chilli seeds from the first and second harvest

Harvest cycle*	Germination (%)	
	Unaged seeds	Aged seeds
1	74.89	50.89
2	71.56	36.56
LSD 0.05	3.33*	7.78

*Each harvest cycle lasted for 6 weeks with a barren period of 10 weeks between the two harvest cycles

*Not significant

fresh weight of the fruit and dry seed weight (Table 1).

Results also indicated that the 'unaged' seed from the two harvest cycles showed no difference in the germination test (Table 2). However, ageing treatment resulted in a significant difference between germination percentage from the two harvest cycles. The 'aged' seeds from the second harvest cycle had significantly lower germination percentage than that of the first cycle (Table 2), thus indicating that the seeds from the second cycle of harvest were less vigorous.

Similar technique was used by Delouche and Baskin (1973) to evaluate 8–30 lots of 16 different seeds. They found such technique suitable for evaluating seed vigour and storability. Seed lots that maintained their germination after this ageing treatment had better storability (Delouche and Baskin 1973).

Powell and Matthews (1985), using a modified technique, also showed that field emergence of kale and swede seeds was significantly correlated with the accelerated ageing test. Seed lots that emerged well in the field had high percentage of germination after accelerated ageing test, whereas those from lots with low germination percentage emerged poorly. In contrast, the laboratory germination of the seed lots (without

undergoing the ageing treatment) did not correlate with field emergence (Powell and Matthews 1985). Perry (1967) also reported that the field sowing value, even within cultivar, was not revealed in the normal germination test.

Conclusion

Results from this study indicate that fruit yield and seeds obtained from the first harvest cycle are superior to that obtained in the second cycle. Seeds obtained from the first cycle, when tested using the accelerated ageing technique, were more vigorous than seeds obtained from the second cycle. Therefore, chilli seeds should be collected from the first harvest cycle to ensure good seed vigour.

References

- Anon. (1985). International rules for seed testing. *Seed Sci. & Technol* 13: 299–355
- Delouche, J. C. and Baskin, C. C. (1973). Accelerated aging technique for predicting the relative storability of seed lots. *Seed Sci. & Technol* 1: 427–52
- Greensill, T. M. (1964). *Gardening in the tropics* London: Evans Brother Ltd.
- Leong, A. C., Vimala, P. and Ding, T. H. (1985). A guide to chilli cultivation in Peninsular Malaysia. *Tekno. Sayur-sayuran, MARDI* 1: 14–9
- Ong, H. T. and Ramlah, M. (1982). Interrelations among features of floral development and abortions in chilli (*Capsicum annum* cv. C 10). *MARDI Res. Bull* 9: 1–10
- Perry, D. A. (1967). Seed vigour and field establishment of peas. *Proc. Int. Seed Test Ass.* 1: 3–12
- Powell, A. A. and Matthews, S. (1985). Detections of differences in the seed vigour of seed lots of kale and swede by the controlled deterioration tests. *Crop Res. (Hort. Res.)* 25: 55–61
- Purseglove, J. W. (1968). Solanaceae. *Tropical crops: dicotyledons* 2 London and New York: Longmans