

(Vamban-1) and cowpea (NPRC-2) and for *varagu* (Co-3) it is cowpea (NPRC 2).

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SEED DEVELOPMENT AND MATURATION IN FENUGREEK

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ABSTRACT

Seed maturation studies in fenugreek cv. Co 1 indicated that the seeds attained harvestable maturity 45 days after anthesis as evident from maximum germination and vigour. The seed moisture content at this stage was around 20 per cent. The seeds attained physiological maturity 40 days after anthesis as indicated by maximum dry weight of seed.

KEY WORDS : Fenugreek, Seed, Development, Maturity

Physiological maturity is the developmental stage at which seeds achieve maximum vigour and viability, since nutrients are no longer entering the seed from the plant and there after seed senescence begins (Harrington, 1972). Prolonged field exposure beyond physiological maturity may lead to reduction in viability and vigour. Physiological changes might set in, if the seeds are retained on the mother plant for longer duration after physiological maturity which would lead to the development of hard seeds or off colour seeds in pulse crops (Dharmalingam and Ramakrishnan, 1978). A study was conducted in fenugreek to trace the seed maturation with a view to determine the optimum stage of harvesting.

MATERIALS AND METHODS

The experiment was conducted at the Department of Seed Technology, Tamil Nadu Agricultural University, Coimbatore using fenugreek cv. Co 1 under irrigated conditions adopting the recommended package of practices. At the time of anthesis, flowers were tagged and the pods collected at five days interval up to 50 days.

breadth, volume and moisture content of pod; those of seeds excepting length and breadth, percentage germination, root and shoot length, dry matter production of seedlings and vigour index were assessed from four replicates of 25 pods (and the seeds from them) taken at random. The volume was measured by water displacement method. The moisture content and percentage germination (based on normal seedlings) in between paper medium, were assessed (ISTA, 1985). The root and shoot lengths were measured in ten randomly selected seedlings. The seedlings were dried in a hot air oven maintained at 85°C for 24 h, cooled in a desiccator for 3 days for drymatter estimation and expressed as mg per seedling. The vigour index was calculated by multiplying the percentage germination with the total length of seedling (Abdul Baki and Anderson, 1973).

RESULTS AND DISCUSSION

A rapid increase in the physical characters of pods and seeds like length, breadth, fresh and dry weight and volume was observed from 10th day and reached a maximum on 30th day (Table 1). The
 was 66.8 per cent for

Table 1. Seed development and maturation in fenugreek

	Days after anthesis										
	5	10	15	20	25	30	35	40	45	50	CD
Pod characters											
Length (cm)	2.07	8.68	10.42	9.85	10.2	10.70	10.30	10.24	10.28	10.03	0.827
Breadth (cm)	0.14	0.31	0.36	0.38	0.43	0.55	0.40	0.39	0.35	0.32	0.039
Fresh Weight (g/100)	2.5	22.1	35.0	80.3	80.9	83.3	27.8	22.0	20.2	18.1	3.3
Dry weight (g/100)	0.4	4.8	7.8	19.3	24.9	27.8	20.4	18.2	17.6	16.0	1.5
Volume (cc/100)	3.0	60	73	81	111	159	106	86	52	43	10.5
Moisture content (%)	81.6	78.0	77.2	76.0	68.9	66.8	61.0	52.0	27.2	26.3	--
Seed characters											
Fresh weight (g/100)	-	0.201	1.236	2.423	2.636	2.896	2.740	2.520	1.526	1.345	0.033
Dry weight (g/100)	-	0.011	0.228	0.677	1.020	1.176	1.266	1.510	1.220	1.110	0.046
Volume (cc/100)	-	0.83	1.06	1.60	1.90	2.60	1.90	1.70	0.90	0.95	0.142
Moisture content (%)	-	94.2	81.5	72.0	61.2	59.3	53.7	40.0	20.0	17.4	--
Germination (%)	-	-	-	-	40.0	61.0	72.0	78.0	92.0	90.0	4.240
					(39.21)	(51.16)	(58.06)	(61.82)	(73.92)	(71.56)	
Root length (cm)	-	-	-	-	7.93	8.30	8.80	9.06	10.03	9.98	0.125
Shoot length (cm)	-	-	-	-	9.46	10.36	10.53	10.73	10.95	10.80	0.159
Dry matter production (mg/seedling)	-	-	-	-	6.7	7.1	7.5	7.8	8.1	8.3	0.204
Vigour index	-	-	-	-	696	1133	1406	1538	1892	1816	109.45

Figures in parentheses are transformed values

Pods and 59.3 per cent for seeds. Beyond this stage, the moisture content of pods and seeds decreased with a concomitant increase in seed dry weight up to 40th day which indicates the attainment of physiological maturity and then the dry weight showed a diminishing trend. The decrease in seed moisture content was associated with the development of seed inside the pod. Delouche (1973) reported that after fertilisation, the moisture content increased for a few days and began to decline with seed development until an equilibrium was reached with the environment. The increase in dry weight of pods was slower than that of seeds. This may be due to the rapid loss of moisture with advancement of maturity, accompanied by the accumulation of food reserves and minerals in seeds.

Germination capacity is undoubtedly an indicator of seed quality. In the present study, the seeds became germinable, 25 days after anthesis (40%) and reached a maximum on 45th day (92%) with a moisture content of 20 per cent. The positive association between seed vigour and dry weight as reported by Delouche (1973) was not borne out by the present study where the maximum dry weight

of seeds was recorded on 40th day and germination on 45th day after anthesis. Again, at this stage only the associated vigour parameters (root and shoot length, and dry matter production of seedlings) were also maximum.

In fenugreek, the seeds attained harvestable maturity 45 days after anthesis as observed by higher percentage germination and vigour. The seed moisture content at this stage was around 20 per cent.

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