

Quality Status of Groundnut Seed at Farmers Level in Gujarat

K.K. DHEDHI, G.J. PARSANA, C.J. DANGARIA AND A.K. JOSHI

Seed Technology Research Unit (NSP), Millet Research Station, Junagadh Agricultural University,
Jamnagar 361 006
dr_ak_joshi@yahoo.co.in

Groundnut (*Arachis hypogaea* L.) is the most important oilseed crop of semi-arid tropics in general and Saurashtra region of Gujarat in particular. It is mostly grown in *Kharif* season. Generally, farmers of Gujarat state use their own seed harvested in the last season, which are stored in gunny bags and kept in common residential room, a traditional method of storage in the region. There is no special facility developed for seed storage. Majority of farmers are using Thiram, Captan or Diathan M-45 fungicides as a seed treatment at the time of sowing. Therefore, the aim of present study was to determine the seed quality status of groundnut used by farmers of Saurashtra region of Gujarat state.

Two hundred ninety three samples of groundnut comprising different varieties (recommended varieties: GG-2, GG-5, GG-7, GG-20, GAUG-10, GAUG-11, GAUG-13 & local varieties: Jangali, Sandhia, Samudri, Shedubhar, Isrial, Tata sumo etc.) were collected from farmers of 47 villages of different talukas of Jamnagar, Rajkot, Amreli and Junagadh districts before sowing of *Kharif* seasons of 2002 to 2005 (Table 1). The number of varieties studied were 8, 11, 10 and 5 in 2002, 2003, 2004 and 2005, respectively. The seed samples were first tested for insect infestation (% seed infested) by visual counting and later on for moisture and germination (%) according to standard procedures [1] and compared with the minimum standards prescribed by Government of India [2]. Two hundred seeds were counted and sown in field in two rows each of 10 meter and

containing 100 seeds with inter and intra row spacing of 60 cm x 10 cm during *Kharif* seasons of 2002-2005. The field germination percentage was recorded by adopting following formula.

$$\text{Field germination (\%)} = \frac{\text{Number of seedlings emerged}}{\text{Number of seeds sown}} \times 100$$

Seed quality status of 293 farmers' saved seed samples were observed and found very good with respect to moisture content, insect damage and germination percentage during 2002 to 2005 (Table 1). The minimum mean percentage of seed moisture content (4.4 %) was observed in 5 and 10 seed samples of Vanthali taluka of Junagadh district and Jamjodhpur taluka of Jamnagar district, respectively, during 2002, whereas, the maximum mean percentage of seed moisture content (5.9 %) was found in 26 farmers' saved seed samples of Tankara taluka of Rajkot district during 2005. All the 293 farmers' seed samples recorded seed moisture percentage less than prescribed maximum seed standards (9 %). The overall average incidence of groundnut seed beetle (*Caryedon serratus* (Oliver)) was observed very low (0.29 %) in the farmers' saved seed samples studied. The highest mean percentage of insect infestation (1.40 %) was recorded in samples of Rajkot taluka during 2004, while, it was lowest (0.02 %) in Vanthali taluka of Junagadh district during 2002. Out of 293 farmers' seed samples, 31, 20, 32 and 30 samples showed very low level of insect infestation during 2002,

Table 1. Taluka wise mean data on various seed quality parameters of farmers' saved seeds of groundnut in Gujarat State.

District	Taluka	Number of farmers/samples					Moisture content (%)					Insect damage (%)					Field emergence (%)					
		2002	2003	2004	2005	Total	2002	2003	2004	2005	Mean	2002	2003	2004	2005	Mean	2002	2003	2004	2005	Mean	
Jamnagar	Jamnagar	6	10	10	11	37	4.5	5.6	5.3	5.8	5.3	0.10	0.03	0.55	0.29	0.22	85	85	78	80	82	
		(2)*	(2)	(2)	(2)	(8)						(4)#	(1)	(4)	(6)	(15)	(92)+	(97)	(91)	(92)	(93)	
	Kalawad	8	-	-	-	8	4.6	-	-	4.6	4.6	0.10	-	-	-	0.10	83	-	-	-	83	
		(2)	-	-	-	(2)						(1)	-	-	-	(1)	(90)	-	-	-	(90)	
	Jamjodhpur	10	-	-	-	10	4.4	-	-	4.4	4.4	0.34	-	-	-	0.34	78	-	-	-	78	
	(2)	-	-	-	(2)						(5)	-	-	-	(5)	(89)	-	-	-	(89)		
	Dhrol	-	-	-	23	23	-	-	5.8	5.8	-	-	-	-	0.08	-	-	-	-	82	82	
		(2)	(2)	(2)	(2)	(2)								(7)	(7)	(92)	-	-	-	(92)	(92)	
Rajkot	Jamkandorna	9	-	-	-	9	4.5	-	-	4.5	4.5	0.53	-	-	-	0.53	81	-	-	-	81	
		(2)	-	-	-	(2)					(4)	-	-	-	(4)	(92)	-	-	-	-	(92)	
	Dhoraji	5	-	-	-	5	4.5	-	-	4.5	4.5	0.64	-	-	-	0.64	78	-	-	-	78	
		(1)	-	-	-	(1)					(4)	-	-	-	(4)	(90)	-	-	-	-	(90)	
	Upleta	9	-	-	-	9	4.5	-	-	4.5	4.5	0.03	-	-	-	0.03	82	-	-	-	82	
		(2)	-	-	-	(2)					(2)	-	-	-	(2)	(94)	-	-	-	-	(94)	
	Rajkot	-	24	5	-	29	-	5.7	5.5	-	5.6	-	0.36	1.40	-	0.88	-	86	77	-	82	
		(2)	(2)	(1)	-	(3)						(6)	(6)	(3)	-	(9)	(98)	(90)	-	-	(94)	
	Gondal	-	-	13	-	13	-	-	5.5	-	5.5	-	-	0.46	-	0.46	-	-	-	79	-	79
		(2)	(2)	(2)	-	(2)						(7)	(7)	(7)	-	(7)	(90)	(90)	-	-	(90)	
Jetpur	-	-	12	-	12	-	-	5.3	-	5.3	-	-	0.38	-	0.38	-	-	-	78	-	78	
	(2)	(2)	(2)	-	(2)						(6)	(6)	(6)	-	(6)	(89)	(89)	-	-	(89)		
Tankara	-	27	-	26	53	-	5.7	-	5.9	5.8	-	0.12	-	0.24	0.18	-	86	-	-	83	85	
	(3)	(3)	(3)	(3)	(6)						(8)	(8)	(8)	(17)	(25)	(98)	(98)	-	-	(91)	(95)	
Amreli	Babra	-	6	-	-	6	-	5.8	-	5.8	-	0.04	-	-	0.04	-	-	85	-	-	-	85
		(1)	(1)	(1)	(1)	(1)						(1)	(1)	-	(1)	(96)	(96)	-	-	-	(96)	
	Bagsara	-	-	14	-	14	-	-	5.3	-	5.3	-	0.39	-	0.39	-	-	82	-	-	-	82
	(2)	(2)	(2)	-	(2)						(6)	(6)	(6)	(6)	(6)	(95)	(95)	-	-	-	(95)	
Amreli	-	10	-	-	10	-	5.7	-	5.7	5.7	-	0.07	-	-	0.07	-	-	85	-	-	-	85
	(2)	(2)	(2)	-	(2)						(1)	(1)	(1)	(1)	(1)	(97)	(97)	-	-	-	(97)	
Junagadh	Junagadh	7	11	11	-	29	4.5	5.7	5.3	-	5.2	0.23	0.05	0.50	-	0.26	81	84	81	-	82	
		(2)	(2)	(1)	-	(5)						(3)	(1)	(6)	-	(10)	(94)	(96)	(92)	-	(94)	
	Vanthali	5	-	-	-	5	4.4	-	-	4.4	4.4	0.02	-	-	-	0.02	83	-	-	-	83	
		(1)	(1)	(1)	-	(1)						(2)	(2)	(2)	(2)	(2)	(94)	(94)	-	-	(94)	
	Keshod	9	-	-	-	9	4.5	-	-	4.5	4.5	0.35	-	-	-	0.35	79	-	-	-	79	
	(2)	(2)	(2)	-	(2)						(6)	(6)	(6)	(6)	(6)	(91)	(91)	-	-	-	(91)	
Bhesan	-	12	-	-	12	-	5.7	-	5.7	5.7	-	0.19	-	-	0.19	-	84	-	-	-	84	
	(2)	(2)	(2)	-	(2)						(2)	(2)	(2)	(2)	(2)	(96)	(96)	-	-	-	(96)	
Total/average	68	100	65	60	293	4.5	5.7	5.4	5.8	5.4	0.26	0.12	0.61	0.20	0.29	81	85	79	82	82		
	(16)	(14)	(10)	(7)	(47)						(31)	(20)	(32)	(30)	(113)	(92)	(97)	(92)	(92)	(92)	(93)	
Range	-	-	-	-	-	-	4.0 to 6.3	4.0 to 6.3	4.0 to 6.3	4.0 to 6.3	0.00 to 4.25	0.00 to 4.25	0.00 to 4.25	0.00 to 4.25	0.00 to 4.25	57 to 94	57 to 94	57 to 94	57 to 94	57 to 94	57 to 94	

*Figure in parenthesis shows number of villages taken for samples collection

#Figure in parenthesis indicate number of seed samples damaged by insects;

+Figure in parenthesis shows germination percentage in laboratory

2003, 2004 and 2005, respectively, while rest of the samples were absolutely free from insect damage. Insect-damaged as well as damage-free samples had per cent germination far above minimum standard (70 %). Thus, in the present study, only 38.57 per cent farmers' seed samples were infested by groundnut beetles and the damage was also very less which ranged from 0.10 to 4.25 per cent. The results are in agreement with the earlier reports [3,4] in groundnut and other crops. The highest mean percentage of field germination (86 %) was reflected in 24 and 27 farmers' seed samples of Rajkot and Tankara talukas of Rajkot district, respectively, during 2003. The lowest mean percentage of field germination (77 %) was recorded in five seed samples of Rajkot taluka during 2004. Among the 293 farmers' seed samples, only fourteen (4.78 %) seed samples recorded less than 70 per cent field emergence during the studies. The lower field emergence in these farmers' saved seed may be the result of relatively higher insect damage coupled with poor vigour because all the seed samples had more than the minimum requirement of 70 per cent germination in laboratory during the study.

In Gujarat about 85 per cent farmers use their own saved seeds and the present study clearly showed that the majority of farmers' saved seed samples of groundnut conformed to the required seed standards for moisture content, germination and seed health with respect to insect infestation, suggesting that seed quality of groundnut was satisfactory in farmer's own saved seed. This is in confirmation with the observation of Lukose *et al.* [5] who reported that all the 100 farmers' saved seed samples of groundnut exhibited germination percentage up to desired level, although seeds were infected by various fungi viz., *Aspergillus* spp., *Rhizopus* spp., *Penicillium* and *Fusarium* spp. Rajendra Kumar *et al.* [6] reported that 99 per cent seed samples of groundnut had germination above prescribed limit. Prasad *et al.* [7] have also drawn similar conclusion through their study that 81 per cent of groundnut and 88 per cent of sunflower seed samples met the minimum requirement of prescribed limit for germination. Recently, survey conducted through National Seed Project [3,4,8] showed that majority of farmers' saved seed samples of groundnut recorded more than 70 per cent germination.

Both, the mean moisture content of seeds (4.4 %) and the mean percentage of insect damage (0.02 %) were minimum in seed samples of Vanthali taluka of Junagadh district during 2002. On the other hand, during 2004, the highest mean percentage of insect damage (1.40 %) of seed samples of Rajkot taluka were due to higher mean percentage of seed moisture content (5.5 %). Hence, the results indicated that there was a direct relationship between the high moisture content of the seed and an increased insect infestation with a corresponding decrease in germination percentage.

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