



Studies on Different Provenances on Sunflower (Morden) Seed Quality

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ABSTRACT

The seed production location is one of the important factor that influences the seed quality. Sunflower (Morden) seeds collected from twenty two locations comprising of four Agro climatic Zones (Nine districts) of Karnataka were tested for seed germination, electrical conductivity, seed size, seed test weight, seed density and seed oil content. Seed collected from Northern Transition Zone (Dharwad and Haveri) showed superior performance for the quality parameters over other locations. Where as, seed collected from Northern Dry Zone (Bellary, Bijapur, Belgaum and Raichur) showed poor performance.

Key words : Seed quality, Sunflower

Sunflower is one of the important oilseed crop of India and its productivity is decreasing from the time of its introduction. One of the main reasons for this is use of poor quality seed. Several abiotic and biotic factors were responsible for the poor quality seed. Among abiotic factors, production environment (location) plays an important role. The selection of better seed production location became an integral part of successful seed production programme in sunflower. The present study was under taken to determine the best production location for quality seed in sunflower in Karnataka.

MATERIAL AND METHODS

In the present study, sunflower (Morden) seeds were collected from 22 certified seed producing areas comprising Bellary, Bijapur, Belgaum and Raichur (Zone-III, Northern Dry Zone), Kolar and Bangalore (Zone-V, Eastern Dry Zone), Hassan (Zone/VII, Southern Transition Zone) and Dharwad and Haveri (Zone-VIII, Northern Transition Zone) with the help of Karnataka State Seed Certification Agency during rabi-summer (1997-98). The seeds were tested for various quality parameters in Department of Seed Technology, University of Agricultural Sciences, Bangalore. The quality parameters tested were

1. Germination percentage (Between paper method)
 2. Electrical conductivity ($\mu\text{S}/\text{cm}$.)
 3. Seed size- The size of the seed was recorded by grain micrometer.
- Seed size= (Length x width x thickness) $1/3$ mm.
4. Test weight (g): The mean weight of 1000

seeds of the sample was recorded as test weight and expressed in grams.

5. Seed oil content (%): Five grams of seeds from each location were subjected to Nuclear Magnetic Resonance Spectrometer (N.M.R. model Brooker Minispic 20 pi) to determine the seed oil content (%) at the Directorate of Oil seeds Research (DOR), Rajendranagar, Hyderabad. The Oil content of seeds was expressed in percentage.

6. Seed density (g/cc)

RESULTS AND DISCUSSION

Seed collected from Havanagi (Haveri) performed highest germination of 92%, closely followed by Soudatti (Balgaum) 91.50% and Veerapur (Haveri) 90.50%. Seed collected from Musho (Bijapur) recorded minimum germination (79.50%). Variation in germination percentage between different locations was observed by Vanangamudi and Karivaratharaju (1985) in sorghum and Thiagarajan (1990) in rice. Seed electrical conductivity was recorded minimum with seeds from Veerapur (Haveri) ($348\mu\text{S}/\text{cm}$) where as maximum with Madenur (Hassan) ($524\mu\text{S}/\text{cm}$). Seed size was maximum (6.76 mm) with seeds from Madenur (Hassan) but these seeds showed minimum seed density (0.580 g/cc). It may be due to more gap within the seed *i.e.*, kernel and inner seed coat. Differences in seed size and test weight among different locations was observed by Kant (1986) in pea. Seeds collected from Balaji camp (Raichur) given least seed size (5.57 mm), test weight (35.56 g) and less seed density (0.590 g/cc). The seeds collected from Veerapur (Haveri) gave maximum test weight (70.71 g) and seed density (0.762 g/cc). Differences in seed

Table 1. Mean Germination percentage, Electrical conductivity ($\mu\text{S}/\text{cm}$), Seed size (mm). Seed test weight (g), Seed density (g/cc) and Oil content (%) of sunflower (Morden) seed produced during Rabi – summer (1997-98) from different locations.

S.No.	District-Place	Code	Germi (%)	E.C. ($\mu\text{S}/\text{cm}$)	Seed size (mm)	Seed test Wt (g)	Seed density (g/cc)	Oil (%)
1	Bangalore-GKVK	L1-1	90.50	433	5.89	44.63	0.629	29.85
2	Bellary-Gundahole	L2-1	89.50	446	6.22	45.73	0.644	32.84
3	Bijapore-Musho	L3-1	79.50	421	5.83	39.83	0.663	35.44
4	Bijapore-Hymel	L3-2	84.00	421	6.13	42.76	0.612	31.93
5	Bijapur-Indi	L3-3	82.00	431	6.06	43.02	0.627	30.46
6	Dharwad-Mandalagi	L4-1	87.50	444	6.43	60.49	0.751	34.39
7	Dharwad-Hedigonda	L4-2	83.50	444	6.20	58.04	0.65	33.37
8	Dharwad-Hedigonda	L4-3	87.50	451	6.39	62.95	0.693	33.15
9	Dharwad-Bokmerd	L4-4	81.00	445	5.94	50.43	0.631	33.20
10	Belgaum-Soudatti	L5-1	91.50	452	5.80	50.93	0.722	33.10
11	Belgaum-Munavalli	L5-2	82.00	558	6.23	53.25	0.587	30.31
12	Belgaum-Tadrains	L5-3	85.00	410	6.20	55.86	0.624	34.56
13	Hassan-Madenur	L6-1	89.00	524	6.76	69.61	0.580	28.08
14	Hassan-Madenur	L6-2	88.00	500	6.14	49.90	0.491	32.77
15	Haveri-Havanagi	L7-1	92.00	390	6.42	67.06	0.745	34.86
16	Haveri-Veerapur	L7-2	88.50	348	6.52	61.31	0.762	32.90
17	Haveri-Veerapur	L7-3	90.50	375	6.30	70.71	0.707	31.29
18	Kolar-Chikkaballapur	L8-1	89.50	462	6.63	66.92	0.607	31.89
19	Kolar-Gudibanda	L8-2	83.50	455	6.52	70.00	0.700	38.11
20	Raichur-Kallur	L9-1	87.50	394	5.94	52.35	0.583	32.91
21	Raichur-Sindhanur	L9-2	83.50	446	6.01	41.49	0.590	25.09
22	Raichur-Balaji Kamp	L9-3	84.00	444	5.57	35.56	0.590	30.54
Mean			86.22	440	6.19	54.21	0.644	32.31
F – Test			*	*	*	*	*	*
SEm +/-			0.9554	4.15	0.022	0.5977	0.598	0.4008
CD at 5%			2.69	11.83	0.064	1.70	1.70	1.14

test and density among different locations was observed by Deshpande and Mahadevappa (1996) in rice.

The oil content was maximum with seeds from Gudibanda (Kolar) (38.11%), where as least with seeds from Sindhanur (Raichur) (25.09%). The seeds collected from Dharwad and Haveri (N.T.Z.) showed comparatively high oil content and constant among the seed lots in between 32-34%, where as from other locations wider variations were found between seed lots. Variation in seed oil content among different locations was observed by Yousuf Alikhan *et al.* (1973) in sunflower and Dhawan *et al.* (1981) in groundnut.

On an average the seeds collected from N.T.Z. (Zone-VIII) showed superior quality compared to others and it may be attributed to favourable environmental conditions such as well distributed rainfall, temperature and relative humidity. The soils are also medium black to deep black, good in fertility status and well suited for seed production. The seeds collected from S.T Z (Zone-VII) and EDZ (Zone-V) showed moderate performance. Where as N.D.Z. (Zone-III) showed poor performance mainly due to high temperature, low rainfall and red sandy loam soils of this zone.

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