

SHORT COMMUNICATION

Sprouting, Growth and Seed Production in Amaranth (*Amaranthus* spp.) Germplasm after Frost

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Amaranth is a crop with multiple uses as food, fodder, medicine and oil. It is grown both in tropical and temperate regions from sea level upto an altitude of 3000 masl. *Amaranthus hypochondriacus*, *A. cruentus*, *A. caudatus* and *A. edulis* are the main grain species while *A. dubius*, *A. bilitum*, *A. viridis* and *A. tricolor* are largely grown for vegetable. *A. hybridus* is used both for vegetable and fodder production (Joshi and Rana, 1991).

Sixty six accessions of recently collected amaranth germplasm were grown for agro-morphological characterization and evaluation at the research farm of National Bureau of Plant Genetic Resources located in Indian Agricultural Research Institute, New Delhi. The crop was sown during October 2005 in Augmented Block Design (Federer, 1956) in seven unequal blocks alongwith three check varieties, namely, Annapurna,

GA-1 and GA-2. Each accession was sown in three rows of 3m length spaced 45 cm apart. Thinning was done 20 days after sowing and a plant to plant distance of 15 cm was maintained.

Three unprecedented spells of frost during the first fortnight of December 2005 (Fig. 1) at vegetative stage severely damaged the crop of amaranth. However, 12 accessions of amaranth showed sprouting 58 days after sowing. The performance of these 12 amaranth accessions with respect to 14 agro-morphological descriptors/descriptor states is discussed in this communication.

The variability observed for different traits is presented in table 1. Plant height was observed to range from 38 cm to 105 cm with the check variety GA-2 exhibiting maximum value (105 cm). Similarly, the number of branches per plant varied from 1.0 to 8.2 and none of the germplasm lines was observed to be more profusely

Table 1. Variability observed in amaranth germplasm for different descriptors/descriptor states

Accession No.	Plant height (cm)	Nos. of branches/plant	Leaf length (cm)	Leaf width (cm)	Days to taken for sprouting	Days to flower after sprouting	Days to 50% flowering	Petiole length (cm)	Panicle colour	Panicle length (cm)	Days to maturity	Seed yield/plant (g)	Seed yield/plot (g)
EC519522	64.50	4.50	7.60	4.40	58	31	41	4.80	Green	53.50	98	–	–
EC519526	67.20	3.60	8.20	4.80	58	32	41	3.60	Green	50.00	108	–	–
EC519558	68.00	5.00	12.10	6.70	58	57	73	7.30	Green	47.00	112	–	–
IC415224	58.00	2.80	3.80	1.80	58	51	62	2.40	Redish	30.80	95	–	–
IC415271	57.00	2.40	4.50	2.30	58	52	62	6.00	Yellowish green	25.00	106	–	–
IC423400	65.75	4.50	9.44	5.42	58	32	45	5.77	Greenish yellow	45.75	100	12.00	355.00
IC444190	42.80	3.00	5.30	2.70	58	52	62	3.00	Yellowish green	30.00	103	–	–
IC444193	38.00	4.00	4.20	2.40	58	53	63	1.60	Red	29.00	107	–	–
SM/BC-12	56.50	2.80	3.50	1.93	58	52	64	2.30	Redish	20.00	106	–	–
Annapurna (C)	42.00	1.00	4.40	2.20	58	54	62	2.20	Yellowish green	25.00	94	–	–
GA-1 (C)	65.00	1.00	9.40	3.60	58	54	62	5.00	Yellowish green	36.00	101	–	–
GA-2 (C)	105.00	8.20	11.40	5.46	58	52	65	8.06	Red	57.00	110	30.00	315.00
Minimum	38.00	1.00	3.50	1.80	58	32	45	1.60	–	20.00	94	–	–
Maximum	65.75	4.50	9.44	5.42	58	54	64	6.00	–	45.75	107	–	–
Mean	51.44	2.93	5.02	2.68	58.00	49.43	60.00	3.32	–	29.36	101.57	–	–

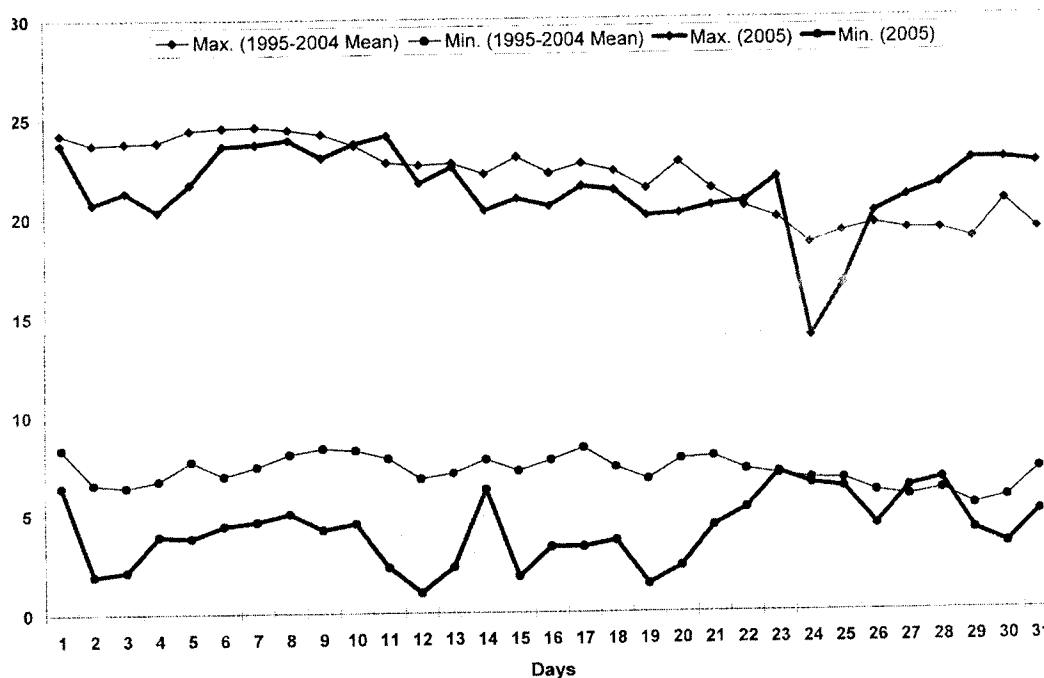


Fig. 1: Maximum and minimum temperature (°C) during December

branched than GA-2. Initiation of flowering was recorded between 31 days (EC519522) and 57 days (EC519558) after sprouting. The early flowering lines were EC519522, IC423400 and EC519526. The range for panicle length was 20-57 cm and genotypes GA-2 (57 cm) and EC519522 (53.5 cm) had more panicle length than the other germplasm lines. Seed production was observed in only two accessions i.e. IC423400 and GA-2. In GA-2 also, seed production was observed in only one block out of the seven blocks, which was probably due to the effect for a tall tree nearby. GA-2 was observed to produce more seed per plant (30 g/plant) as compared to IC423400 (12 g/plant) while on the other hand, IC423400 produced

more seed per plot (355 g) than GA-2 (315 g).

The accession IC423400 was *A. caudatus*, which has been reported to be resistant to chilling (Phogat and Sharma, 2000).

References

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