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A Key to Identify Soybean Varieties of Karnataka

Soybean (*Glycine max* (L.) Merrill), an important *kharif* legume crop continues to spread in India with an unprecedented addition of approximately 5 lakh hectares in area and 5.5 lakh quintals in production every year with a productivity of 1000 kg/ha. In India, it is cultivated in 6.35 m ha with a production of 5.9 m t. In Karnataka also, area has increased from 16,000 ha during 1991-92 to about 1 lakh ha during 2001-02. Soybean is rich in protein (40%) and oil (20%). Soybean protein has an optimum amino-acid profile and thus good in quality. Many varieties are developed and released for cultivation. In general, to exploit the full potentiality of the improved varieties, maintenance of genetic purity is important for which simple, easily identifiable and stable characters are required. In soybean, quality seed production occupies greater importance due to poor seed viability and germination. During field inspection, specific characters which are visualized easily can be used for identification, as these characters are expected to be highly stable and heritable under varied environmental conditions. In addition, in the new IPR regime, distinctness, uniformity and stability (DUS) testing of cultivars is essential for proprietory reasons. In India, about 62 cultivars are released for general cultivation. For Karnataka state, six varieties have been released and one is in prerelease stage. Their pedigree and salient features are presented in table 1.

Mainly three morphological traits *viz.*, flower colour, pubescence (presence/absence & colour) and seed hilum colour are used to identify the cultivars. These are qualitative and

Table 1: Pedigree details and salient features of soybean varieties released for Karnataka state

Sl. No.	Variety	Pedigree	Year of release	Salient features
1	Hardee	D-49-772 / Improved pelican	1976	Determinate and fairly tolerant to bacterial pustule
2	KHSb-2	Mamloxi / EC 39821	1979	Semi determinate, drought tolerant, moderately tolerant to bacterial pustule and also suitable for cultivation in paddy fallows
3	Monetta	An exotic variety EC 2587	1985	Determinate, very early, suitable for intercropping, field tolerance to insect pests
4	JS-335	JS-78-77 / JS 71-05	1994	Semi determinate, tolerant to pod shattering upto 8-10 days after maturity, resistant to bacterial pustule, released for Agro-climatic zones 1, 2, 3 & 8
	5	KB-79 Monetta	Hardee /	1996 Resistant to soybean mosaic, suitable for intercropping, released for Agro-climatic zones 4, 5, 6 & 7.
6	PK-1029	PK-262 / PK 317	2002	Determinate, tolerant to soybean rust released for endemic areas (parts of Agro-climatic zones 3 & 8) of rust
7	DSb-1 (Pre-release)	Selection from EC-172576	-	Semi determinate, multiple pest resistant (recommended for Agro-climatic zone-1)

hence stable and heritable across environments. Flower colour is either purple or white with purple dominant over white (Owen, 1928). Pubescence colour is either tawny or grey (Woodworth, 1921). Seed hilum colour is either black, brown or rosy (Mahmud and Probst, 1953). Identification of varieties using these simple morphological characters appears to be quite simple and adequate for soybean varieties listed in this paper. As it is clear from table 2, consideration of only flower colour will help in distinguishing seven cultivars into two groups *viz*., one with purple and another with white colour. Therefore, this alone cannot be used to uniquely identify any of these seven cultivars distinctly. Same is the case with consideration of pubescence alone. Even the combination of these two is useful in identification of only three varieties uniquely. But consideration of seed hilum colour with aforesaid two characters has certainly helped in uniquely identifying each variety with a specific combination of these three traits (Table 2). For example when it is WGR it is Hardee and when it is WTB it is PK-1029. Therefore it is suggested that the use of these colour traits together could serve as much efficient, quick and reliable markers in identifying soybean varieties especially in seed certification programmes. But with further release of some more soybean cultivars, in addition to the morphological markers, the use of biochemical/ molecular markers is necessary for cultivar finger printing. Gorman *et al*. (1982) used multiple enzyme system for complete cultivar finger printing.

Table 2: Morphological characters to identify the soybean varieties

Sl. No.	Variety colour	Flower colour	Pubescence colour	Hilum	Combination of colour traits
1	Hardee	W	G	R	WGR
2	KHSb-2	P	T	B	PTB
3	Monetta	P	T	Br	PTBr
4	JS-335	P	A	B	PAB
5	KB-79	P	G	Br	PGBr
6	PK-1029	W	T	B	WTB
7	DSb-1	W	T	Br	WTBr

A = Almost absent, B = Black, G = Grey, P = Purple, R = Rosy,
T = Tawny, W = White, Br = Brown,

AICRP on Soybean
Main Agricultural Research Station
Dharwad - 580 005

G. T. BASAVARAJA
G. K. NAIDU
P. M. SALIMATH

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