

**APPENDIX - I**  
**Distinguishing characters of parental inbreds of CoH2 Hybrid Maize.**

Characters	UMI.810	UMI.90
Colour and number of internodes	Green 12-16	Green 10-11
Colour of brace root and its development	Pink with greenish yellow tinge	Pink with greenish yellow tinge
Stem colour	Green	Green
Leaf size and texture	Pubescent, broad leaves with white midrib	85-90 cm length, 7.5-8.5 cm width, pubescent leaves
Silk colour	Yellowish green, turns pink	Yellowish green turns pink
Tassel colour and type	Yellowish green turns pink	Yellowish green turns pink with 15-20 branches in tassel
Cob colour and shape	Cylindrical with deep orange flint grains	Cylindrical with yellow grains
Grain colour and texture	Deep orange, flint grains	Yellow flint
Special feature	Resistant to downy mildew	Slightly susceptible to downy mildew

cent increased yield over the checks CoH1 and Co 1 respectively (Table. 2)

The incidence of downy mildew disease under sick plot conditions were recorded for 8 years and mean incidence of CoH2 (UMH.9) was 1.1 per cent as against 2.9 and 28.3 per cent in CoH1 and Ganga.5 respectively (Table.2). In ART, this hybrid recorded 3432 kg/ha in 45 trials which is 11.4 per

cent increase over CoH1 and 6.2 per cent over Ganga.5.

In view of the high yield, disease resistance and grain quality, this hybrid was released as CoH2 for general cultivation in Tamil Nadu.

The description of the parental varieties are given in Appendix.1.

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## X6 - A NEW PEARL MILLET HYBRID FOR TAMIL NADU

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### ABSTRACT

With a view to develop a downy mildew resistant high yielding hybrid in pearl millet, number of crosses were effected between the stable downy mildew resistant male sterile line (PT 732A) and different inbreds. A combination, UCH 11 (PT 732A x PT 3095) was identified and released as hybrid X6 for general cultivation in Tamil Nadu in view of its high yield potential and resistance to downy mildew disease. The features of the hybrid are described in this paper.

Tamil Nadu occupies seventh position both in area and production of pearl millet (*Pennisetum glaucum* (L)R.Br.) in the country with an estimated area of 2.98 lakh ha and production of 2.81 lakh tonnes annually. The discovery of cytoplasmic genic male sterility and the development of male sterile line Tift 23A(A1 source) by Burton (1958) was the basis for hybrid seed production in this crop. Two other sources of male sterility were subsequently identified in India (Athwal, 1965) viz., L 66A(A2 source) and L67A (A3 source).

The major problem encountered with the pearl millet hybrids is their susceptibility to downy mildew. This poses a bottleneck for increasing the yield and productivity in this crop. Intensive efforts to diversify the male sterile sources at Tamil Nadu Agricultural University resulted in the development of a new stable, dwarf and highly tillering male sterile line PT 732A (Appadurai *et al.*, 1982) with a different cytoplasmic background and resistant to downy mildew. An attempt was made to develop a high yielding downy mildew resistant hybrid using this male sterile line with proven restorers and the results are reported.

Table 1. Overall Mean Performance of UCH 11.

Details	Number of Trials	Yield kg/ha						
		UCH 11	WCC 75	CO 7	ICMS 7703	KM2	X5	
Station Trials		Irrigated	4108	3281	3366	3336	2928	3600
		Rainfed	3355	2723	2684	2824	2258	3155
Multilocation Trials	5	Rainfed	2113	1485	1595	1765	1496	1902
ART	67	Irrigated	2364	2559	2509	2656	2383	2462
		Rainfed	1713	1394	1400	1446	1686	1677
Mean	238	Irrigated	3236	2920	2938	2996	2656	3031
		Rainfed	2394	1867	1893	2012	1813	2245
% on respective check		Irrigated		110.8	110.1	108.0	121.8	106.8
		Rainfed		128.2	126.5	119.0	132.1	106.6

## MATERIALS AND METHODS

Hybrid combinations were made during 1983 summer involving the male sterile lines 81A (developed at ICRISAT) and PT 732A (developed at TNAU) and homozygous inbred lines selected for phenotypic superiority and abundance of pollen production. Among these hybrids, one involving PT 732A and PT 3095 was found to be promising in Initial Hybrid Trials. This combination was designated as UCH 11 (MH 180) and tested in Multilocation Trial at 5 centres, in Adaptive Research Trial including 67 irrigated trials and 238 rainfed trials in Tamil Nadu during 1984 to 1990 and also in All India co-ordinated Trials. The hybrid was tested for its reaction to downy mildew and ergot diseases at Coimbatore during 1987-1988.

## RESULTS AND DISCUSSION

The overall mean yield performance of the hybrid X6 in comparison with the ruling hybrids, composites and synthetic are detailed in Table 1. In Station trials, the hybrid was tested during 1984 to 1990 in summer (irrigated) and Kharif (rainfed) seasons. The hybrid recorded a mean yield of 4108

and 3355 kg/ha in Summer and Kharif seasons, respectively. The increase in yield was 18.3 to 48.6% over WCC 75, CO 7, ICMS 7703 and KM 2.

During 1987-88 the hybrid recorded a mean yield increase of 19.7, 32.5, 41.2 and 42.3% over ICMS 7703, CO 7, KM 2 & WCC 75, respectively in Multilocation Trials. A total number of 305 Adaptive Research Trials (67 irrigated & 238 rainfed) were conducted with this hybrid and the results revealed the overall superiority of the hybrid. Though the hybrid recorded a lower mean yield of 1713 kg/ha in Kharif & rabi seasons than that recorded during summer (2364 kg/ha), the percentage increase in yield over the checks is higher in rainfed situations.

The overall mean performance of the new hybrid revealed 19 to 28% yield increase over the varieties and 32% increase over KM 2 in rainfed situations. Under irrigated conditions, the overall mean grain yield was 3236 kg/ha which was higher by 8-10% over the hybrids. Thus, the hybrid proved its suitability for all pearl millet growing tracts of Tamil Nadu including rainfed and irrigated situations.

The hybrid was also tested for its disease reaction against downy mildew (sick plot test), rust and ergot (field screening). The hybrid recorded downy mildew incidence of 3.0% as against 33.0% recorded by KM2 indicating its capacity to resist the disease. The incidence of ergot and rust is comparatively lesser (Table.2). Sequential release of hybrids is a safe measure to tackle diseases caused by pathogens capable of developing new races quickly. The new hybrid can be recommended as an alternative to KM 2 & WCC

Table 2. Reaction to downy mildew, rust and ergot in 1987-1988.

Entry	Downy Mildew (%)	Rust (grade)	Ergot (%)
UCH 11	3.0	3.5	53.0
X5	1.0	3.5	45.0
KM2	33.0	4.5	63.5
WCC 75	2.8	3.5	43.0
Co 7	5.1	4.0	60.0
ICMS 7703	2.3	3.0	68.0
HB 3	54.7	4.0	78.4

**Table 3. Morphological Description of X6 and its parents.**

Character	X6	PT732A	PT 3095
Days to 50% flowering	55-60	55-60	55-65
Duration (days)	95-100	87-95	85-95
Plant height (cm)	155-175	70-85	160-175
Number of tillers	4-6	4-6	4-5
Ear length (cm)	20-25	18-25	25-28
Ear shape	Spindle	Spindle to conical	Spindle to cylindrical occasionally conical
Hairiness	Clabrous	Glabrous	Glabrous
Nodal colour	Green	Green	Green
Pigmentation	Green	Green	Green
Grain colour	Slate colour	Slate colour	Slate colour
1000 grain weight (gm)	7.7-8.8	5.6-7.3	6.4-7.8

75. The hybrid now developed has the female parent, PT 732A which is different from that of the parents of the previous released hybrids. Synchronised flowering was observed in both male and female parents. As abundant pollen is produced in male parent, the ratio of planting female and male in hybrid seed production can be altered as against 4:2.

The pearl millet hybrid, X6 is of medium duration with synchronised flowering of 4 to 6 tillers and mean 1000 grain weight of 7.7 to 8.8 Madras Agric. J., 81(7): 362-364 July, 1994

## HETEROSIS IN FODDER TRAITS OF SORGHUM

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### ABSTRACT

Forty two hybrid combinations and their parents were evaluated for heterosis in fodder yield and their component characters. Observations were recorded on six characters namely plant height, number of leaves, leaf-shoot ratio, total soluble solids, crude protein yield, and dry matter production. Significant heterosis was recorded by all hybrids over mid-parent for plant height. For dry matter production yield 3660 A x M 35-1 and 2077 A x M 35-1 exhibited maximum heterobeltiosis. The cross combination 3660 A x Co 23 expressed maximum heterobeltiosis for plant height. The hybrid combination such as 2077 A x FS.1, 2077 A x M 35-1, 2077A x K7 3660 A x Co 25 and 2219 A x FS, are all worth for pursuing for their best per se performance for plant height crude protein yield, total soluble solids and dry matter production.

The varieties with good fodder quality available in the germplasm are found to be either poor quality and palatability are an acceptable to

gms (Table. 3). Its resistance to downy mildew, high protein content (11.4%), medium grain size and market acceptability of the grains are added advantages.

In view of the above desirable attributes, the hybrid UCH 11 has been released as X6 for general cultivation, which is a boon to the farmers of Tamil Nadu.

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### REFERENCES

- ATHWAL, D.S. 1965. Current plant breeding research with special reference to *Pennisetum*. *Indian.J. Genet.*, 26 A: 73-85.
- APPADURAI, R., RAVEENDRAN, T.S. and NAGARAJAN, C. 1982. A new male sterility system in Pearl Millet. *Indian.J. Agric. Sci.*, 52: 832-834.
- BURTON, G.W. 1958. Cytoplasmic male sterility in Pearl Millet (*Pennisetum glaucum* (L) R. Br.) *Agron. J.*, 50:230.

the consumers. The exploitation of heterosis through the utility of cytoplasmic genic male sterility has been successfully established in