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# CoH 3 : A NEW DOUBLE CROSS MAIZE HYBRID FOR TAMILNADU

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**ABSTRACT**

UMH 10 is a medium duration (95-100 days) double cross maize hybrid suited for cultivation both under rainfed (Sep-Oct) and irrigated (June-July and Jan-Feb) situations. It has an yield potential of 8875 kg of grains and 19 tonnes of fodder per hectare. It is highly resistant to sorghum downy mildew disease and maize stem borer. It possess desirable attributes such as high starch (64.8%) and high protein (11.03%). Grains are bold, orange yellow in colour and flint in texture. It was released as CoH 3 maize hybrid during 1996 to replace CoH 2 hybrid.

KEY WORDS: CoH 3, Maize hybrid, High starch, Coarse cereals

Maize (*Zea mays*L.) is an important industrial crop in the coarse cereals. It is suited to a wide range of climatic conditions than either wheat or rice, because of its greater adaptability. In Tamil Nadu, coarse cereals area is gradually reducing every year which is due to change of food habits of the rural populations and switching over to remunerative crops. But the area under maize cultivation is increasingdue to its greater demand for poultry and animal feed industries. Maize is cultivated in an area of 0.53 lakhha. with an annual production level of 0.77 lakh tonnes and the productivity of 1453 kg/ha (1992-93) which is below the national average of 1694 kg/ha (1992-93). To meet the growing demand and to increase production and productivity of maize crop in the state of Tamil Nadu, a new high yielding CoH 3 maize hybrid was developed to replace exisiting CoH 2 hybrid.

## MATERIALS AND METHODS

High yielding and good combining inbred lines identified in the gene bank were utilized for synthesizing single and double cross maize hybrids. After testing a series of double cross hybrids in the yield trials an elite high yielding double cross maize hybrid UMH 10 (UMI 101 x UMI 130) x (UMI 90 x UMI 285) was identified. This was evaluated in station trials at the Department of Millets, multilocation trials in different research stations and adaptive research trials in farmers' holdings in different districts and the results are presented.

## RESULTS AND DISCUSSION

The mean performance of the double cross maize hybrid UMH 10 in station trials, multilocation trials and adaptive research trials are presented in Table 1. Under irrigated conditions, hybrid UMH 10 recorded a mean grain yield of 5023 kg/ha with 22 and 25 per cent increase grain yield over the existing composite variety Co 1 (4135 kg/a) and hybrid check CoH 2 (4041 kg/ha). The same hybrid under rainfed conditions recorded a mean grain yield of 4215 kg/ha with 16 and 13 per cent increase in grain yield over check Co 1 (3640 kg/ha) and CoH 2 (3735 kg/ha). It has an yield potential of 8875 kg of grain and 19 tonnes of fodder per hectare. This hybrid is highly resistant to sorghum downy mildew disease and maize stem borer (Table3).

This hybrid matures in 95-100 days. Plants are tall and yields both grain and fodder. The grains are bold, orange yellow in colour and flint in texture. The cobs are fully covered with husk and the percentage of seed set is very high. In hybrid seed production, the female parent UMI 101 should be sown 3-4 days in advance to male parent (UMI

**Table 1 : Mean performance of UMH 10 in different trials conducted both in rainfed and irrigated conditions.**

| Name of the trial | No. of trials | Grain yield (kg/ha) | | |
|---|---|---|---|---|
| | | UMH 10 | CO 1 | COH 2 |
| **Irrigated** | | | | |
| 1. Research Station trials | 12 | 5478 | 4548 | 4666 |
| 2. Multilocation trials | 13 | 4667 | 3725 | 3928 |
| 3. All India trials | 18 | 6517 | - | - |
| 4. Adaptive Research trials | 27 | 3934 | - | 3505 |
| Mean | 70 | 5023 | 4135 | 4014 |
| | | (70) | (25) | (52) |
| % on CO 1 | | 122 | 100 | 97 |
| % on CoH 2 | | 125 | 103 | 100 |
| **Rainfed** | | | | |
| 1. Research Station trials | 4 | 5385 | 4530 | 4612 |
| 2. Multilocation trials | 3 | 3022 | 2729 | 2869 |
| 3. Adaptive Research trials | 34 | 4194 | - | 3728 |
| Mean | 41 | 4215 | 3650 | 3735 |
| | | (41) | (7) | (41) |
| % on CO 1 | | 116 | 100 | 103 |
| % on COH 2 | | 113 | 97 | 100 |
| **Overall Mean Irrigated and Rainfed** | | | | |
| 1. Research Station trials | 16 | 5455 | 4543 | 4653 |
| 2. Multilocation trials | 16 | 4358 | 3538 | 3728 |
| 3. All India trials | 18 | 6517 | - | - |
| 4. Adaptive Research trials | 61 | 4079 | - | 3630 |
| Mean | 111 | 5100 | 4040 | 4005 |
| | | (111) | (32) | (93) |
| % on CO 1 | | 126 | 100 | 99 |
| % on COH 2 | | 127 | 101 | 100 |

**Table 2. Mean performance of UMH 10 under adaptive research trials conducted both inirrigated and rainfed situations (92-93 to 94-95)**

| Year | | Irrigated Grain yield (kg/ha) | | Rainfed Grain yield (kg/ha) | |
|---|---|---|---|---|---|
| | | UMH 10 | COH 2 | UMH 10 | COH 2 |
| 1992-1993 | Mean | 4467 (12) | 3908 (12) | 3780 (10) | 3316 (10) |
| | % on COH 2 | 114.3 | 100.0 | 114.0 | 100.0 |
| 1993-1994 | Mean | 2914 (7) | 2680 (7) | 3995 (10) | 3716 (10) |
| | % on COH 2 | 108.7 | 100.0 | 107.5 | 100.0 |
| 1994-1995 | Mean | 4026 (8) | 3624 (8) | 4633 (14) | 4031 (14) |
| | % on COH 2 | 111.1 | 100.0 | 114.9 | 100.0 |
| Overall Mean | | 3934 (27) | 3505 (27) | 4194 (34) | 3728 (34) |
| | % on COH 2 | 112.2 | 100.0 | 112.5 | 100.0 |

Figures in paranthesis indicate number of trials conducted.

**Table 3 : Reaction of parents and hybrids to major diseases under field and artificial conditions**

| Inbred line / Hybrid | | D.M. (%) | | TLB (1-5) | | PFSR (1-9) | | RUST (1-5) | |
|---|---|---|---|---|---|---|---|---|---|
| | (F) | CBE (A) | MAN (F) | NAG | DHO | HYD | DHAU | DHAU | DHO |
| **Diseases** | | | | | | | | | |
| UMI 101 | 0.0 | - | - | - | - | - | - | - | - |
| UMI 130 | 0.0 | - | - | - | - | - | - | - | - |
| UMI 90 | 0.8 | - | - | - | - | - | - | | - |
| UMI 285 | 0.0 | - | - | - | - | - | - | | - |
| UMH 10(H) | 0.0 | 6.0 | 0.0 | 2.0 | 3.4 | 5.8 | 4.6 | 2.0 | 3.0 |
| COH 2 (ch) | 0.0 | 28.2 | - | - | - | - | - | - | - |
| CO 1 (ch) | 0.0 | 47.0 | - | - | - | - | - | - | |
| Ganga 5 (ch) | 82.0 | - | - | - | - | - | - | - | - |
| Pests | | | | | | | | | |
| | | P.B. (%) | | | | | | | |
| | | HYD | | | | | | | |
| UMH 10 | | 4.5 | | | | | | | |

**Diseases**

D.M. - Downey mildew (Coimbatore, Mandya (Karnataka))
TLB - Turcicum leaf blight (Nagenahalli (Karnataka), Dholi (Bihar))
PFSR - Post flowering stalkrot (Hyderabad, (A.P), Dhallakuan (H.P))
RUST - (Dhallakuan (H.P), Dholi (Bihar))

**Pests**

P.B. - Pink borer (Hyderabad (A.P))

**Table 4 : Results of quality analysis of maize samples**

| Sample | Protein (%) | Oil content (%) | Starch (%) | Total sugar (%) |
|---|---|---|---|---|
| UMH 10 | 11.03 | 4.85 | 64.8 | 2.56 |
| COH 2 (ch) | 10.10 | 4.54 | 63.0 | 3.12 |
| CO 1 (ch) | 10.57 | 4.83 | 63.0 | 2.56 |

130) for the production of single cross hybrid (UMI 101 X UMI 130). Another single cross hybrid (UMI 90 x UMI 285), the female parent (UMI 90) should be sown 8-10 days in advance tomale parent (UMI 285). For double cross hybrid seed production, the male parent (UMI 90 x UMI 285) should be sown 6-7 days in advance to female parent (UMI 101 x UMI 130)

It possesses desirable attributes such as high starch (64.8%), high protein (11.03%) and high oil content (4.85%) than CoH 2 and Co 1 (Table 4). In view of the superior performance, UMH 10 was released as CoH 3 maize hybrid during 1996 as pongal gift to farmers.

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