



ICRISAT HYBRIDS AND VARIETIES IN 1987

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Introduction

This paper concerns released and promising hybrids and varieties from ICRISAT. In the case of released hybrids and varieties attention is focused on certified seed production and, for WC-C75, a survey on farmer acceptance is reported.

Data from the AICMIP trials have been analyzed further to examine if the material has any particular adaptations within India. As in the ICRISAT reports on the International Pearl Millet Adaptation Trials (IPMAT), data are reported for India on a north/south basis. North is defined as all states north of Maharashtra, and south as all states south of and including Maharashtra.

New hybrids and varieties that will be entered in the 1987 AICMIP trials are briefly discussed.

ICRISAT Hybrids

Seed Production of Released Hybrids ICMH 451 and ICMH 501

Two hybrids were released in 1986: ICMH 451 with B1A as the seed parent, and ICMH 501 with 834A as the seed parent. Data for the supply of breeder seed and information on planting areas, show that only ICMH 451 is being multiplied on a large scale. In Nizambad district of Andhra Pradesh alone, there are over 1000 ha of seed production plots of ICMH 451. Various estimates indicate that seed sufficient to plant perhaps 1 million ha or more will be produced for the 1987 kharif season. Seed production of ICMH 451 has proved to be straightforward, because the synchrony of the parental lines is good, with the pollinator flowering 1-3 days earlier than the seed parent. This means that pollen is available when B1A first

flowers, and agronomic manipulation can improve the synchrony still further if this is required. The yields from B1A have been good, as under favourable environments, it is high-tillering with very good seed set.

By contrast, there are difficulties in producing seed of ICMH 501. At certain planting dates seed set can be very poor on the male-sterile line B34A (Table 1), and seed set is never excellent. There is also a lack of synchrony, with the pollinator flowering about 17 days later than the seed parent. These difficulties will almost certainly mean that ICMH 501 will not be multiplied on a wide scale, although the hybrid has the advantages of earliness, large seed size, a pedigree unrelated to previously released hybrids, and high downy mildew resistance.

Seed Production of Promising Hybrid ICMH 423

ICRISAT hybrid ICMH 423 has yielded slightly more than MBH 110 in the AICMIP trials. It has B41A as the seed parent and the phenotype of the hybrid is similar to BK 560. Its acceptance with farmers could therefore be high, and the evidence so far is that seed production would be easy. We expect almost perfect synchrony between the two parents. The pollinator ICMH 423 (EC-53-211-1) is profusely tillering, vigorous, and a good pollen producer. The male-sterile line should also be productive and has excellent seed set.

Adaptation of ICMH 451, ICM 501, and ICMH 423

The performance of these three hybrids has been analyzed on a north/south basis (Table 2). The yields of the ICRISAT hybrids are expressed relative to all of the entries in the trial (i.e., the trial mean yield), so if the relative performance of the hybrid changes from north to south it shows that its adaptation differs from the average adaptation of the entries. On this basis ICMH 451 and ICMH 501 are somewhat more adapted to the south

than the average entry, whilst ICMH 423 is more adapted to the north. Among the three hybrids, ICMH 451 shows the greatest stability between regions.

The same analysis has been made relative to MBH 110, and ICMH 451 and ICMH 501 have similar adaptations to it (Table 3), because they have approximately equal superiorities in both north and south. ICMH 423 is markedly superior to MBH 110 in the north (Table 3).

Hybrids ICMH 83401 and ICMH 84122

ICRISAT hybrids which have been in the AICMIP trials for 1 or 2 years all have 81A as the seed parent. Of these ICMH 83401 has shown, over 2 years, almost the same superiority to MBH 110 as ICMH 451. ICMH 84122 in its 1st year in the trial was the highest-yielding 81A hybrid.

New Hybrids

In an attempt to diversify the genetic base of the hybrids, and--it is hoped--to increase yields further, ICRISAT will enter into the 1987 AICMIP trials two hybrids on 852A, and one hybrid on 863A. The two hybrids on 852A, ICMH 85109 and ICMH 85231, have outyielded MBH 110 in ICRISAT trials by about 18%. We will continue to try to put hybrids on new male-sterile lines in the AICMIP trials to test the value of the male-sterile lines, and to try to ensure that there is a choice of hybrids with different seed parents. We are giving emphasis, in our 1987 ICRISAT trials, to hybrids on 863A, ICMA 87001, ICMA 87002, and ICMA 87003.

ICRISAT Varieties

Released Varieties WC-C75, ICMS 7703, and ICMS 7704

Multiplication and cultivation of WC-C75. The Maharashtra State Seeds Corporation obtained 15 kg of breeder seed from ICRISAT in December 1981.

They increased this seed to 550 t within two generations and 10 months. Of this, 508 t were sold for the 1983 season, and about 110 t of seed produced by other government and private seed agencies were also sold. At a seed rate of 2.5 kg ha⁻¹, about 250 000 ha were planted in 1983. Besides the existing foundation and certified seed stocks produced in 1983, estimated at 1200 t, 12 seed-production agencies in India requested and received 281 kg of breeder seed for the 1983-84 off-season increase, which meant that about 100 t of foundation seed were available for increase in 1984.

Although the cultivation of WC-C75 by farmers had spread to all the nine major pearl millet producing states of India by the 1984 rainy season, large-scale farmer use and seed multiplication was largely confined to Maharashtra. However, we estimate that in 1985 over 1 million ha of WC-C75 were planted in India, including 400 000 ha in Maharashtra, and at least 200 000 ha in Haryana, Rajasthan, and Uttar Pradesh. In Tamil Nadu, where WC-C75 was not grown at all 2 years earlier, over 50% of its 385 000 ha of pearl millet was planted to WC-C75.

By the 1986 seed production season, there was large-scale seed production in most of the nine states, including Rajasthan, Gujarat, Uttar Pradesh, and Haryana. The demand for breeder seed of WC-C75 continues. For example, from January 1985 to April 1986, in response to requests for 800 kg of breeder seed, ICRISAT supplied 560 kg to seed production agencies in India. Recent ICAR figures give a planned production of more than 4 870 t of certified seed for the 1987 kharif planting, sufficient to plant 1.5 million ha.

Farmer's perceptions of WC-C75. A survey was conducted to examine how WC-C75 compared with hybrids and the local varieties, since there was little

