

extensively grown wheat. During the last twenty to twenty-five years, however, Pusa wheats have replaced the local irrigated wheats, especially the Mondhya variety. Of the various Pusa wheats, Pusa-4 (now I.P. 4) has spread very extensively, due mainly to its shorter period of maturity than local varieties, which helps it usually to escape steam-rust of wheat as well as saves the farmer an irrigation or two.

Although Pusa-4 has spread widely it has certain drawbacks. It shatters its grain rather easily if not harvested just in time. It does not tiller well and due to fewer leaves per plant the straw is coarse. Farmers, therefore, complain of its poor quality of *bhusa*. Moreover, Pusa-4 is an awnless wheat which affords it little protection against the attack by birds.

In the year 1932-33 Pusa-4 was crossed with a synthetic durum, Bansipli-809, with a view to combine the good characters of the two species. Bansipli-809 is itself a derivative from the cross of a synthetic Khapli, K. K. 568, and an improved durum strain, Motia (Bansi-168).



Niphad-4

Pusa-4

### A NEW QUALITY WHEAT FOR BOMBAY

THE annual wheat acreage in Bombay Province covers an area of nearly 16 lacs of acres. The bulk of the area is under dry wheat and is concentrated in the north-central Deccan, north Gujarat and eastern Karnatak. Almost all of the main tracts have now suitable improved strains of dry wheats. The irrigated wheat area in the Province, however, varies from 1,50,000 to 2,00,000 acres annually, and although the area is comparatively small, it is scattered throughout the Province. The varieties of wheat under irrigation are Khapli (*T. diococum*), Baxi (*T. durum*) and Mondhya (*T. vulgare*), the latter being once the most

Bansipli-809 has black awns like Kala-Khapli-568, but unlike either Kala-Khapli or Motia varieties, it is an earlier maturing type. From

TABLE I

Milling and baking quality behaviour of Niphad-4 and its parents, Pusa-4 and Bansipli-809

Name of wheat	100 grain wt. gm.	Mottled grain %	Protein %	Feeds %	Straight run flour %	Loaf volume c.c.	Loaf type	Grain No.	Quality score %
N-4 (1942)	4.67	1.8	13.52	20.7	75.8	680	FII	6	85.0
N-4 (1943)	5.01	1.2	13.30	22.0	75.2	620	F	4	78.0
P-4 (1943)	4.38	7.4	13.40	23.6	73.0	510	FJ	3-4	65.0
Bansipli-809 (1943)	4.90	0.0	14.10	24.0	71.8	345	JK	3	36.5
								Under-developed	

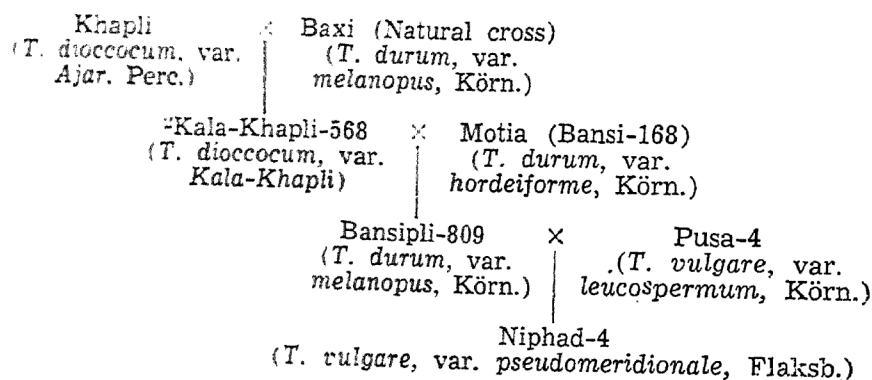
the cross of B-809 and Pusa-4 pure breeding, synthetic *vulgare*-like cultures were obtained in 1936-37. Comparative trials of these cultures with Pusa-4 for four years, from 1937-38 to 1941-42, at the Cereal Breeding Station, Niphad, showed that the culture 5-1-38-5 was the best. It was released for district trials in 1942-43 under the name Niphad-4. District trials in the Nashik and Ahmednagar districts of the Deccan and in the Kaira district of Gujarat showed that Niphad-4 was better in various agronomic characters than Pusa-4 and Pusa-52 respectively. At the Cereal Breeding Station, Niphad, as well as in the districts it has usually given 7 to 8 per cent. more yield of grain than Pusa-4. Niphad-4 is more leafy and tillers more heavily than Pusa wheat and thus its *bhusa* is better than the latter.

Niphad-4 requires about 120 days from sowing to harvest, the life-period being more or less the same as that of Pusa-4. The awns of Niphad-4 are black at the base and glumes are white and hairy. These two characters would

fewer mottled grains and its flour-yield is 3 per cent. more than that of Pusa wheat. The loaf-volume of the new wheat is much higher than that of Pusa-4 and in quality-score it considerably, outpoints the Pusa wheat. Ramdhan Singh<sup>1</sup> observes, "Niphad-4 showed an exceptionally high baking quality. In fact it turned out to be one of the very best wheats handled by us so far. By yielding a shapely loaf of bread with an even crust of almost uniform break and shred, approaching Manitoba wheat in this respect, crumb of white colour, soft, resilient texture, silky to touch, an even 'grain' with rather elongated pores having thin cell walls, it scored as high as 79.7 baking marks. It also showed the highest oven-spring of 2.0 cm."

Niphad-4 also yielded best *chapatecs*. Its *chapatecs* were sweetish in test, softest and most pliable and were highest in fresh weight. They were, however, tough and greyish in colour.

The pedigree of Niphad-4 is as follows:—



help to rouge fields of Niphad-4 as no other irrigated wheat in Bombay, except Baxi, possesses this character-combination. Baxi, however, is a durum wheat, and the shape of its ear and length of awns are quite distinct from those of Niphad-4. The full-awned condition of Niphad-4 affords it better protection from the attack of birds.

The grains of Niphad-4 are like those of a durum wheat; they are larger, 100 grains weighing nearly 5 grams as against 4.5 grams of Pusa-4. Unlike the Pusa wheat Niphad-4 does not shatter grains.

Like Pusa-4 the new wheat is also susceptible to all the known races of stem-rust in India and to remedy this defect it has been crossed with certain immune Kenya wheats.

In the year 1942 and again in 1943 samples of Niphad-4 were sent to Rao Bahadur Ramdhansingh, Cerealist, Department of Agriculture, Punjab, to determine its milling and baking qualities. With the second lot of Niphad-4, samples of seed of its parents—Pusa-4 and Bansipli-809—were also supplied. Comparative milling and baking data of Niphad-4 and its parents were kindly supplied to us by the Cerealist. The more important information is presented in the following table.

It will be seen from the above figures that Niphad-4 surpasses Pusa-4 in almost all the milling and baking attributes in both the years. It will be noted that Niphad-4 develops

The new wheat is now being multiplied for spread in the irrigated tracts of the Bombay Province.

Cereal Breeding Station,  
Kundewadi, Niphad,  
(H.Q. College of Agriculture,  
Poona 5),  
March 14, 1944.

B. S. KADAM.

1. Ramdhan Singh, "Progress Report of the Scheme for Wheat Milling and Baking Tests for the Year ending June, 1943", I.C.A.R. and Department of Agriculture, Punjab, 1943. 2. Kadam, B. S., "Genetics of the Bansi Wheat of the Bombay Deccan and a Synthetic Kapli, Part I." *Proc. Indian Academy of Sciences*, 1936, 4, No. 5, 357-69.