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Varietal Tolerance in Wheat to a Selective Herbicide, Dosanex

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ABSTRACT

Of the twentyfive varieties of wheat studied for tolerance to Dosanex 80 WP (Metoxuron), four varieties, *viz.*, HD 1925, HD 1949, HD 7717 and HD 9747 showed good tolerance upto a dose of 6 kg/ha. The most susceptible varieties were WP 833 and HD 1944 which expressed early toxicity, while progressive toxicity was noted with WG 377 and WG 357 even at 2 kg/ha dose. All the other varieties had total tolerance or showed toxicity upto 5 per cent level for the first 15 days after application at 2 kg/ha dose of the herbicide. Weed control was quite satisfactory even at 2 kg/ha. Local variety, Samba showed good tolerance upto 4 kg/ha. 2-4 D 80 WP at 2 kg/ha did not cause any phytotoxicity.

INTRODUCTION

Dosanex 80 WP is a selective post-emergence herbicide based on the urea derivative, Metoxuron, N-(3-Chloro-4-Methoxyphenyl) - N N-dimethyl urea. This chemical has been found effective against two grassy weeds, wild oats (*Avena fatua*) and *Phalaris minor* which cause considerable damage to the wheat crop in North India (Gill and Brar, 1975).

It is often observed that the selective herbicides vary in their phytotoxic effects to different varieties of the same crop. Thiede (1975) observed sensitive cultivars in winter wheat to Metoxuron and most of the varieties studied were sensitive to 6 kg/ha of Metoxuron. Stryckors and Himme (1974) observed that Metoxuron at 7 kg/ha was of particular hazard to wheat cultivars, Anouk, Aider and Val. Earlier work of Peturova (1974) showed that the varietal response of wheat to Dosanex is manifested by change in plant development rather than by nitrogen and carbohydrate metabolism of the plant. Muller and Sanad (1975) stated that varietal susceptibility to Metoxuron was related to the metabolism of the compound rather than the uptake and distribution. Further, it was indicated that the tolerant cultivars rapidly detoxified the herbicide whereas the susceptible varieties contained relatively large amounts of unchanged Metoxuron in their leaves.

As there are more than 40 varieties of wheat commonly cultivated in India, it is considered necessary to study the varietal response to Metoxuron in detail before making field recommendations for this product. In the present study, 25 popular wheat varieties were grown at Coimbatore (Tamil Nadu) under the

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same agro-ecological conditions and tested for phytotoxic response to Dosanex 80 WP at three dose levels.

MATERIALS AND METHODS

Twentyfive varieties of wheat were collected from various States of India and studied during 1974-75 and 1975-76 seasons. Sowing was done in Nov. which is best suited for this tract. Each season replicated trial was conducted using randomised block design with five treatments, eg., Dosanex 80 WP at the rate of 2, 4 and 6 kg/ha and 2-4 D 80 WP formulation at the rate of 2 kg/ha as standard for comparison. Each variety was sown in five rows in plots of 2 x 30 m in 1974-75 and 1.5 x 15 m in 1975-76, and was adopted with uniform cultural practices. As the seedlings attained 3-4 blades stage, the herbicides were applied as sprays with knapsack sprayer using Birchmeier 160 nozzle. Percentage toxicity was assessed 7, 10 and 15 days after application. After this period, either recovery or kill of the plant due to toxicity observed earlier, was recorded.

RESULTS AND DISCUSSION

At 2, 4 and 6 kg/ha of Dosanex 80 WP, the varieties HD 1925, HD 1949, HD 9747 and HD 7717 showed good tolerance, and the plants which exhibited early toxicity within tolerance range at higher dose levels totally recovered on the 15th day after application, with the emergence of new foliage. Toxicity symptoms observed were drying of leaf tips and margins, typical symptoms caused by urea derivatives.

Dosanex 80 WP at 2 kg/ha effective controlled all the weeds. It is particularly interesting to note that most of the varieties of wheat studied showed good tolerance (0 to 5% toxicity) to Dosanex 80 WP at this dose level(Table). Early expression of toxicity upto 15% level showed quick recovery in most of the varieties except WP 377 and WG 357 wherein late expression of high toxicity was oberved.

TABLE. Varieties showing varying toxicity at 2 kg/ha of Dosanex 80 WP

Toxicity range		
0—5%	5—15%	Above 15%
HD 1925	UP 301	WG 377
HD 1949	UP 310	WP 833
HD 1982	Raj 821	WG 357
HD 2009	Sangam	
HD 4519	HD 1944	
HD 7717		
HD 9747		
J 17		
J 24		
PV 18		
S 308		
S 1553		
Kalyan Sona		
Raj 911		
Samba		
Heera		
HD 4530		

At 4 and 6 kg/ha of Dosanex 80 WP all varieties other than the four cited earlier developed toxicity symptoms. Upto 5 per cent level of toxicity, the recovery was fast without impairing growth, and between 5 and 15 per cent level the recovery was relatively slow. Above the 15 per cent level either the

crop was left stunted on recovery or killed progressively. However, considering the high efficacy and low toxicity of Dosanex 80WP at 2 kg/ha to most of the varieties, the observations with higher doses become less important. No toxicity was observed with 2-4 D (80% WP) at 2 kg/ha of the formulated product.

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