

Field Desiccation of Millets

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The efficacy of common salt, Gramoxone and Reglone sprays as pre-harvest desiccants on bajra (*Pennisetum typhoides* L.) and sorghum (*Sorghum vulgare* Pers.) was studied. Appreciable grain moisture reduction (7.5 to 21.5%) in sorghum had occurred when pre-harvest desiccants were sprayed at different stages of maturity. Moisture reduction in boot leaf and stem was not to this extent. Gramoxone at 0.10% (a.i.) was more effective than the other desiccants tried. Moisture reduction was more pronounced in 48 hr than in 24 hr of spraying. The late tillering habit and uneven maturity in rainfed bajra make it difficult to adopt pre-harvest desiccation.

Even after physiological maturity, the millet crops are generally retained in field for a considerable period for grain moisture reduction by natural desiccation taking advantage of tropical sun, to improve thrashing and to obtain glume-free grains. Considerable damage due to birds occur during this period. It has been indicated that the pre-harvest losses in rice can be reduced by spraying desiccants at its physiological maturity (Pillaiyar *et al.* and Sethuraman *et al.*, 1981) with appreciable grain and straw moisture reduction. To find out the effect of spraying desiccants on bajra and sorghum a study was taken up and the results are presented in this paper.

MATERIAL AND METHODS

Trials with bajra and sorghum were conducted in the monsoon season of 1978 and 1979 in the fields of the Millet and cotton Experiment Station, Kovilpatti. In the 1978 trials, common

salt solutions of 5, 10, 15 and 20 per cent concentration (500 l/ha), chalk powder at 25 kg/ha and trisodium phosphate at 25 kg/ha were sprayed; dusted on 15th and 25th day of 50 per cent flowering of both the crops. In 1979 trials, sodium chloride 20 per cent solution, Gramoxone and Reglone at 0.05 and 0.10 per cent (a.i.) were sprayed (500 l/ha) on 20th, 23rd and 25th day of 50 per cent flowering of K5 sorghum raised under rainfed condition. Treatments with water spray (Control I) and an unsprayed control (Control II) were also included. The crop was harvested after 48 hr of spraying along with the controls. Samples of grain, and boot leaf and stem were collected at random before and after 48 hr of spraying and the moisture content was determined by drying in an air oven for 24 hr.

RESULTS AND DISCUSSION

In rainfed bajra, a highly cross pollinated crop, the maturity of the

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TABLE I. Effect of Desiccants on Grain Moisture Reduction in sorghum (Percentage)

Treatments	23-day of 50% flowering				25-day of 50% flowering			
	After spraying				After spraying			
	24 hr		48 hr		24 hr		48 hr	
	A	B	A	B	A	B	A	B
Common salt 10% solution	22.0	26.0	20.0	24.0	22.0	23.0	20.0	20.0
„ 20% solution	21.8	24.0	18.0	23.8	18.0	22.2	16.0	17.6
Gramoxone 0.05% (a.i.)	20.0	22.0	15.8	21.8	20.0	19.6	18.0	16.4
„ 0.10% (a.i.)	15.8	20.0	12.0	16.0	14.0	18.1	11.8	11.6
Reglone 0.05% (a.i.)	19.8	24.0	15.0	23.8	21.8	20.0	20.0	12.2
„ 01.0% (a.i.)	20.0	22.0	18.0	20.0	17.8	19.8	14.0	12.0
Control I	34.0	27.8	25.0	25.8	26.0	29.0	25.8	26.0
Control II	33.0	26.0	26.0	25.4	25.8	28.4	24.0	27.6

A and B = First and Second sown monsoon crops.

Grain moisture content before spraying : 37.3% in the I season and 32.0% in the second season on 23rd day; 27.5% in the I season and 30.0% in the II season on 25th day.

grains was not uniform. Moreover, a lot of side tillers were in milky stage although main tillers were ready for harvest. Considering the necessity for harvesting this crop in stages it was found that field desiccation would affect the total yield even if the desiccation effects of these chemicals were pronounced. Visible desiccation effect such as drying up of leaves was noticed in 1978 crop but unseasonal rain interfered with the harvest and consequently data on moisture reduction could not be collected in the case of sorghum.

In the 1979 crop, the effect of Gramoxone and Reglone sprays was noticeable in the whole plant (dried up completely); whereas common salt sprayed crop exhibited spot drying in leaves. The moisture reduction was higher in grains (Table I) than in leaves and stems (Table II). The grain moisture on 23rd and 25th day after 50 per cent flowering was 37.3 and 27.5 per cent in the first sown crop whereas it was 32.0 and 30.0 per cent on 20th and 25th day of 50 per cent flowering in the 2nd sown crop. By spraying desiccants, a very high reduction (rang-

TABLE II Desiccating Effect of Chemicals on Leaf and Stem of *Cholam*

Treatments	First Sown Mon soon Crop				Second Sown Crop			
	23rd day 50% flowering		25th day 50% flowering		20th day 50% flowering		25th day 50% flowering	
	After 48 hr of spraying		After 48 hr of spraying		After 48 hr of spraying		After 48 hr of spraying	
	L	S	L	S	L	S	L	S
Common salt 10%	60.0	77.0	62.0	76.5	67.0	77.0	61.5	71.5
.. 20%	59.8	72.9	61.0	76.0	65.9	76.7	60.0	70.0
Gramoxone 0.05%	59.9	70.0	60.0	73.0	66.0	74.0	69.2	69.7
.. 0.10%	49.9	65.0	51.0	65.0	55.0	68.0	52.0	68.5
Reglone 0.05%	56.9	71.9	59.0	70.0	60.0	71.0	59.5	69.9
.. 0.10%	53.9	70.0	56.5	68.0	57.9	69.0	53.2	69.0
Control I	64.0	76.9	63.0	77.0	70.0	77.2	61.7	71.7
Control II	63.5	77.9	62.9	76.7	69.0	77.5	62.0	72.0

(L = LEAF S = STEM)

Moisture content before spraying

	L	S
I season 23rd day	65.5	80.2
25th day	64.8	78.2
II season 23rd day	70.2	77.9
25th day	63.0	73.0

ing from 7.5 to 21.5 per cent) in grain moisture had occurred; the influence of Gramoxone spray in the grain moisture reduction was higher than other desiccants tried. Of the two concentrations 0.10 per cent Gramoxone spray exhibited the maximum effect; same is the case with the Reglone spray. Among the two concentrations of common salt

solution, 20 per cent spray seemed to be more effective in grain moisture reduction. Harvesting the crop after 48 hr of spraying resulted in appreciable grain moisture reduction than after 24 hr of spraying. The desiccation effects of these chemicals were more pronounced while spraying on 25-day rather than on 20-day or 23-day of 50 per

cent flowering. Pronounced moisture reduction in cases of stem and leaf had occurred only in Gramoxone 0.10 per cent spray (Table II).

Though the desiccation effect of these chemicals was pronounced, the correct stage of spraying the desiccants on millets has to be fixed. At present, it seems that no work on the harvest indices for millet has been carried out. Further study to determine the harvest indices and physiological maturity for different cultivars of millet seems to be necessary.

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