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Research Notes

Field germinability and storability of rice seeds treated with maleic hydrazide spray

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Investigations were carried out at Rice Research Station, Ambasamudram to induce seed dormancy in rice seeds (Var. ASD 16) and to arrest sprouting in field under inclement weather condition at Ambasamudram during the harvest of the 1st season (Kar) crop, maleic hydrazide at 200 ppm and 500 ppm concentration spray was given to the standing crop of rice 10, 15, 20 & 25 days prior to harvest.

Weekly evaluation of germination potential of maleic hydrazide sprayed seeds in the field prior to harvest indicated that no seed was found germinated after two weeks of harvest. Maleic hydrazide sprayed seeds require more than one month to attain mean seed certification standard (MSCS) level of seed germination. The treated seeds were forwarded for storage under ambient condition along with control and tested for its germination and drymatter production at regular monthly interval (Table 1)

The mean data recorded for germination (%) and dry matter production (mg/10 seedlings) were statistically analysed by Factorial Randomized Block Design, as suggested by Panse and Sukhatme (1957).

The highest germination percentage of 92.0 was recorded by the control plot seeds (T_1) at one month after storage (P_1). At the end of 9 months of storage the germination percentage of T_1 and T_2 were 82.0 and 75.6 respectively. The drymatter production (mg/ 10 seedlings) varied from 138.9 to 129.2 among treated and untreated seeds for different periods of storage (Table 2).

In general the seed germination percentage and drymatter production declined as the period of storage prolonged. The level of decline in percent germination was higher in untreated seeds than the treated seeds.

Table 1. Germination percentage of maleic hydrazide sprayed seeds

		W1	W2	W3	W4	W5	Mean
M1	Tl	0.50	40.33	68.33	89.66	89.66	58.00
	12	0.50	43.00	61.33	92.00	92.00	58.00
	T3	0.50	39.66	62.66	92.00	92.00	57.36
	T4	0.50	41.66	70.00	92.00	92.00	59.23
Mean		0.50	41.16	65.58	91.41	91.25	—
M2	Tl	0.50	0.50	33.33	71.66	87.33	39.00
	T2	0.50	17.66	38.66	73.00	91.66	44.29
	T3	0.50	24.00	41.33	79.66	91.66	47.43
	T4	0.50	22.33	44.33	82.33	88.33	47.56
Mean		0.50	16.12	39.41	77.00	90.00	—
M3	Tl	0.50	0.50	22.33	33.33	54.66	22.26
	T2	0.50	0.50	29.66	41.00	62.33	27.00
	T3	0.50	0.50	37.66	49.00	77.33	33.00
	T4	0.50	22.00	38.00	62.00	82.33	41.00
Mean		0.50	6.00	32.00	46.33	69.16	—

	SEd	CD (0.05)
T	0.55	1.09
M	0.48	0.95
W	0.62	1.22
TM	0.96	1.90
MW	1.07	2.12
TW	1.24	2.45
TMW	2.14	4.25

T_1 - 10 days prior to harvest
T_2 - 15 days prior to harvest
T_3 - 20 days prior to harvest
T_4 - 25 days prior to harvest
M_1 - Control
M_2 - Maleic hydrazide at 200 ppm
M_3 - Maleic hydrazide at 500 ppm
W_1 - 1 week after harvest
W_2 - 2 weeks after harvest
W_3 - 3 weeks after harvest
W_4 - 4 weeks after harvest
W_5 - 5 weeks after harvest

The inhibitory effect of maleic hydrazide (MH) (1, 2 dihydro - 3 - 6 pyridazinedione) on the respiratory activity of plant cells and inducing ripening stages of various crops was reported by several authors. The bulbs of onion when treated with maleic hydrazide at different concentrations induced dormancy which in turn arrested the sprouting of onion bulbs (Benkeblia, 2004). The effect of MH was to inhibit mitosis in the meristamatic region. Plant metabolic studies had shown that, besides its many physiological side activities, MH acted as an antagonist of phyrimidine bases (Appleton *et al.,* 1981). These authors noted that MH was incorporated into RNA cells where it substituted for cytosine rather

Table 2. Evaluation on germination and drymatter production of seedlings treated with maleic hydrazide spray and stored rice seeds.

	Germination (%)			Dry matter production (mg/10 seedlings)		
	Tl	T2	Mean	Tl	T2	Mean
P1	92.00	81.66	87.00	138.90	138.46	137.00
P2	88.67	82.66	86.00	136.10	135.56	136.00
P3	88.66	83.33	86.00	137.00	135.23	136.11
P4	87.66	80.33	84.00	133.86	134.53	134.19
P5	86.33	79.00	83.00	136.20	135.66	136.00
P6	85.66	77.66	82.00	134.73	135.66	135.19
P7	84.33	78.00	81.16	133.66	132.23	133.00
P8	84.33	75.33	80.00	134.93	130.36	133.00
P9	82.00	75.66	79.00	131.80	129.20	130.50
Mean	87.00	79.29	—	135.24	134.09	—
		SEd	CD (0.05)	SEd	CD (0.05)	
	T	0.72	1.47	0.48	0.98	
	P	1.53	3.12	1.03	2.09	
	TP	2.17	4.42	1.45	2.96	

T_1 - control seeds
T_2 - Maleic Hydrazide sprayed seed
P_1 - 1 month after storage
P_2 - 2 months after storage
P_3 - 3 month after storage
P_4 - 4 months after storage
P_5 - 5 months after storage
P_6 - 6 months after storage
P_7 - 7 months after storage
P_8 - 8 months after storage
P_9 - 9 months after storage

than uracil, its structural isomer. Developed countries utilise the inhibitory effect of maleic hydrazide to store the perishable agriculture produces (Appleton *et al.,* 1981).

It is evident from the study that maleic hydrazide spray to rice crop prior to harvest, initially inhibit the emerging radicle to come out due to its action in cells. Later the cells resumes its normal growth after some period.

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