

EFFECT OF SEED SOAKING TREATMENT WITH AGRO-CHEMICALS ON GERMINATION AND SEEDLING ATTRIBUTES OF WHEAT

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A field experiment was conducted at Rajasthan college of Agriculture, Udaipur with Sonalika (HD-1553) variety of wheat. Of the seven seed soaking treatments viz., control (dry seed), distilled water KH_2PO_4 (5%), CaCl_2 (0.25%), Cycocel (0.1%), NaCl 2.5% and saturated solution of $\text{Ca}(\text{OH})_2$. Treatment with KH_2PO_4 enhanced the germination by reducing days of emergence and increasing the number of seedlings per metre row length. Dry matter accumulation and seedling height were also increased. KH_2PO_4 treatment increased N, P and K uptake, with resultant dry matter accumulation.

In crop production, use of good sowing Quality results in healthy and vigorous seedlings stand under field condition favouring higher production potential. Several workers (Keller and Bleak, 1968; Krestschmer and Beger, 1970; Chaudhuri and wiebbe, 1968 and Lyles and Fanning, 1969) had reported effect of seed soaking with certain agro-chemicals under stress conditions. However, studies on the effect of seed soaking chemicals on wheat crop in field conditions in India are limited. Hence to study the effect of pre-soaking chemicals, a field experiment with wheat was conducted at Rajasthan College of Agriculture, Udaipur.

MATERIALS AND METHODS

Field experiment was conducted with the Sonalika (HD - 1553) variety of wheat at Rajasthan College of

Agriculture, Udaipur (Rajasthan) in Rabi 1976 - 77. The soil of the experimental field was clay loam in texture and alkaline in reaction. The following soaking treatments were given viz. (i) control, (ii) distilled water, (iii) 5% potassium dihydrogen phosphate (KH_2PO_4), (iv) 0.25% calcium chloride (CaCl_2), (v) 0.1% Cycocel (CCC), (vi) 2.5% sodium chloride (NaCl) and (vii) saturated solution of calcium hydroxide ($\text{Ca}(\text{OH})_2$). The seeds were soaked for 14h followed by drying 4h for at room temperature; then they were sown at a depth of 4.5 cm along the ridges at 20 cm row spacing. The experiment was set in randomised block design and an uniform seed rate of 100 kg/ha was adopted.

The time taken for seedling emergence was recorded when constant number of seedlings was observed from two randomly selected rows of

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Table 1. Effect of seed soaking agro-chemical treatments on seedling emergence, development and NPK content and its uptake in wheat CV HD-1553.

Treatment	Period of seedling emergence (days)	Seedling count/metre row length	Root length (cm)	Seedling height (cm)	Dry matter accumulation g/seedling	(Content %)			Uptake (mg/seedling)		
						N	P	K	N	P	K
Control	8.33	12.96	9.5	16.9	0.402	4.25	0.660	4.79	17.085	2.653	19.256
Distilled water	7.33	14.37	11.2	20.7	0.475	4.18	0.671	4.77	19.855	3.187	22.658
KH ₂ PO ₄	6.67	14.37	13.0	22.0	0.482	4.23	0.690	4.79	20.389	3.323	23.088
CaCl ₂	7.50	13.42	10.7	17.2	0.409	4.00	0.662	4.76	16.360	2.708	19.283
Cycocel	8.75	13.46	12.7	16.6	0.401	4.49	0.682	4.81	18.005	2.743	19.288
NaCl	7.67	12.87	11.0	18.6	0.425	4.21	0.676	4.77	17.893	2.873	20.273
Ca(OH) ₂	8.08	13.58	10.9	17.9	0.417	4.12	0.671	4.74	17.180	2.798	19.766
CD (P=0.05)	0.67	1.12	1.9	2.0	0.036	NS	NS	NS	2.171	0.614	3.752

one metre size. The number of emerged seedlings was counted 20 days after sowing. For recording dry matter accumulation, seedling height and root length, 10 plants were selected at random. N, P and K content of seedling were determined by standard method from the oven dried samples and the N, P and K uptake per seedling was calculated

RESULTS AND DISCUSSION

The period of seedling emergence was significantly reduced with KH_2PO_4 , distilled water and CaCl_2 treatment as compared to control (Table 1). It may be due to early start of germination in these treatments compared to the control. This was in conformity with the finding of Chaudhuri and Wiebbe (1968) and Lyies and Fanning (1969). Both KH_2PO_4 and distilled water were equally effective in enhancing seedling emergence.

Seedling dry matter production and height were the highest with KH_2PO_4 followed by distilled water and both were significantly superior to control. The results were in conformity with the findings of Sinha and Rom (1970). Root length of seedling was maximum with KH_2PO_4 (13.0 cm) followed by Cycocel (12.7 cm) and both being on par were superior to control (9.5 cm). Bapat and Umale (1973) and Robertson and Greenway (1973) also observed similar results with regard to KH_2PO_4 and cycocel treatment of seed.

Due to seed soaking treatment N, P, and K contents of wheat seedling

were not affected whereas N, P and K uptake per seedling was increased (Table 1). It was found that seed treatment with KH_2PO_4 increased uptake of N, P and K over the control whereas the seed treatment with distilled water increased only N uptake. Similar results were also reported by Abdou Kobbia (1976).

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