

Seed technology

Revitalizing stored rice seeds

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Seeds of rice varieties ADT36, JJ92, ASD16, ASD38, ADT39, Co43, IR20, MDU2, MDU4, Ponni, and White Ponni stored under ambient conditions (75% relative humidity, 25-35°C, 12% moisture content) for 28 mo were subjected to hydration-dehydration treatment by soaking in water (1:2v/v) for 6 h. The seeds were then dried to their previous moisture content and stored for another 6 mo.

We evaluated them every month after that for germination rate and dry matter production of seedlings (mg seedling⁻¹) to determine the rejuvenation ability of these varieties.

All showed significant improvement in germination rate with the treatment compared with untreated controls. ADT38 recorded the highest recovery, with a difference of 34% over the untreated seed. Untreated seeds of all the varieties were nonviable at 31 mo, while treated seeds showed some degree of viability even after 33 mo (Table 1).

Hydration of stored seeds has been hypothesized to quench the free radi-

cals, thereby arresting membrane damage and promoting repair mechanisms. The effect of hydration-dehydration nearly doubled the germination rate and slowed the rate of decline in viability. The effectiveness of the treatment, however, varied among varieties.

This method can be used to re-energize seeds showing declined viability after being stored for some time. The increase in seedling dry matter of hydrated-dehydrated seeds (Table 2) also shows the re-energization of cells, leading to improved overall synthesis of metabolites for growth and development. ■

Table 1. Response of rice varieties (germination percentage) to hydration-dehydration treatment.

Variety	Months							Months						
	Hydrated-dehydrated (treated)							Control (untreated)						
	28	29	30	31	32	33	Mean	28	29	30	31	32	33	Mean
ADT36	35	36	23	15	11	3	20.5	11	8	5	0	0	0	2.17
JJ92	31	23	13	8	0	0	12.5	19	11	4	0	0	0	5.67
ASD16	60	49	36	26	12	0	30.5	39	21	9	4	0	0	12.20
ADT38	49	35	23	21	12	3	23.8	15	16	7	0	0	0	6.33
ADT39	57	51	39	31	16	4	33.0	13	14	8	0	0	0	5.83
Co 43	61	56	47	24	14	4	34.3	33	20	9	0	0	0	10.30
IR20	47	29	28	19	12	3	23.0	24	16	0	0	0	0	6.67
MDU2	56	36	28	21	11	1	25.5	33	24	11	0	0	0	11.30
MDU4	51	40	35	25	16	0	27.8	19	11	4	0	0	0	4.67
Ponni	40	35	21	13	8	0	19.5	19	5	4	0	0	0	7.17
White Ponni	44	24	19	13	8	0	18.0	28	11	4	0	0	0	0
LSD (0.05)	9.07	9.67	9.04	6.17	4.05	1.58		6.12	4.21	2.18	0	0	0	

Table 2. Response of rice varieties (mg dry matter seedling⁻¹) to hydration-dehydration treatment.

Variety	Months							Months						
	Hydrated-dehydrated (treated)							Control (untreated)						
	28	29	30	31	32	33	Mean	28	29	30	31	32	33	Mean
ADT36	17.17	14.60	14.58	13.92	10.91	1.58	13.84	2.62	1.12	1.06	0.0	0.0	0.0	1.60
JJ92	19.42	18.61	16.13	11.39	12.63	10.16	10.93	6.83	3.62	2.11	0.0	0.0	0.0	2.09
ASD16	19.18	17.16	15.78	13.47	0.0	0.0	12.87	4.43	3.18	1.18	0.0	0.0	0.0	1.47
ADT38	23.54	21.88	21.64	17.42	11.63	0.0	19.24	10.0	8.62	5.11	2.2	0.0	0.0	4.32
ADT39	18.04	17.63	14.63	12.92	16.88	14.11	13.58	3.36	3.00	2.52	0.0	0.0	0.0	1.48
Co 43	15.51	14.36	13.79	12.95	9.68	8.62	11.98	4.00	3.68	3.00	0.0	0.0	0.0	1.78
IR20	15.15	13.97	13.20	10.10	10.12	5.18	11.99	2.33	2.00	0.0	0.0	0.0	0.0	0.72
MDU2	26.33	24.32	21.20	20.75	10.10	5.36	18.39	6.00	5.72	5.13	0.0	0.0	0.0	2.82
MDU4	20.15	19.89	16.45	15.04	9.56	8.18	11.92	9.32	8.18	6.63	0.0	0.0	0.0	4.02
Ponni	21.67	19.72	18.33	17.22	0.0	0.0	12.83	12.75	5.28	4.15	0.0	0.0	0.0	3.69
White Ponni	20.17	19.59	16.70	12.08	0.0	0.0	11.42	12.62	8.58	3.16	0.0	0.0	0.0	4.06
LSD (0.05)	3.01	2.93	2.68	2.80	5.56	4.58		3.49	2.41	1.82	0.0	0.0	0.0	