

HYDRATION-DEHYDRATION TECHNIQUE, A MID-STORAGE CORRECTION TO PROLONG VIABILITY OF RICE SEEDS

Rice seeds are hygroscopic in nature as they absorb and lose moisture depending on the relative humidity and temperature of the surrounding atmosphere. The high relative humidity and temperature as prevalent in Kerala favours rapid absorption of moisture under ordinary storage conditions and this ultimately impair the storage life of rice seeds. The study was undertaken to find the effect of subjecting the seeds to hydration dehydration treatment on the extension of seed viability.

Seeds of two popular short duration varieties viz., *Jyothi* and *Triveni* were harvested and stored in gunny bags under ambient storage conditions. Seeds harvested both during *kharif* (April-May to September-October) and *rabi* (September-October to December-January) were utilized for the study. Three kg each of the stored seeds were soaked in water for 4 h and dried back to the original weight and moisture content and stored. Fortnightly soaking was done after storing and the first soaking was 15 days after harvest and continued for a period of one year. Germination tests were conducted as per *ISSTA* (Anon., 1976) for both the hydrated seeds and the control at fortnightly intervals to assess the optimum time of soaking for maximum extension of viability.

Table 1. Period of viability retention of the control and treated seeds of *Jyothi* and *Triveni* for *kharif* and *rabi* seasons, months

Season	Variety	Control	Treated
Kharif	<i>Jyothi</i>	H	14
	<i>Triveni</i>	9	12
Rabi	<i>Jyothi</i>	9	14
	<i>Triveni</i>	8	10

Results of the hydration dehydration treatment showed that the viability of the paddy seeds can be extended well over 80 per cent for a

minimum period of two months and a maximum period of five months depending on the variety, quality of the seed and the season of harvest. Storage life of rice seeds from *kharif* harvest was more than that of *rabi* harvest. Seeds of *Jyothi* and *Triveni* harvested during the *kharif* season remained viable for a period of eleven months and nine months respectively, when stored under ambient storage conditions, while seeds of the same varieties obtained from the *rabi* crop harvest remained viable only for nine and eight months respectively.

The initial moisture content of the seeds from the *kharif* crop was 20 per cent while that from the *rabi* crop was only 16 per cent. This might be one of the reasons for the higher quality of seeds obtained from the *kharif* crop (Mohankumar *et al.*, 1988). Irrespective of the variety, hydration dehydration treatment helped to retain 80 per cent viability in the seed lot for a further period of three more months in the *kharif* crop seeds. A five months extension was possible for the *rabi* crop seeds of *Jyothi* while only two months extension was obtained for the *rabi* crop seeds of *Triveni*.

The critical time of soaking the seeds for extension of viability was also studied and found that the optimum time is when the germination is within a range of 75 to 80 per cent. Initial soaking when the germination is within 85 to 90 per cent was found unnecessary. Similarly, soaking at very later stage, that is when the germination is below 70 per cent was found ineffective, since the germination per cent of the hydrated seed was not up to the desired level (80 per cent). Water soaking checks fungal attack in the seeds especially under high humid conditions as in Kerala state. Leaching out of auto-toxic metabolic byproducts accumulated in the seeds during post-harvest storage may also be a factor contributing to the extended viability of the seeds (Basu *et al.*, 1974).

Table 2. Effect of hydration-dehydration on viability of rice seeds after different periods of storage

Season	Variety	Parameter	1*		2		3		4		5		6	
			1**	2	1	2	1	2	1	2	1	2	1	2
Kharif	Jyothi	G	98	97	94	92	93	92	93	92	93	93	93	93
		P	10.5	10	9.5	10	9.5	9	8.5	9	10.5	11	8.5	9
	Triveni	G	91	92	92	93	93	91	91	91	94	90	90	92
		P	8.5	7.5	6.5	7	7	7	7.5	7	7.5	7.5	7.5	8.5
Rabi	Jyothi	G	99	97	98	96	98	98	96	95	95	95	95	94
		P	8.5	7.5	6.5	6.5	6.5	7.5	6.5	8.5	8.5	8.5	8.5	9.5
	Triveni	G	98	98	98	96	93	95	95	92	93	95	95	92
		P	7.5	7	6	6	6.5	6.75	7	8	8.25	8	8.25	8.75

Table 2 (contd..)

Season	Variety	Parameter	7		8		9		10		11		12	
			1	2	1	2	1	2	1	2	1	2	1	2
Kharif	Jyothi	G	95	92	94	95	94	93	89	91	90	82	11	46
		P	9.5	9	11	11	12.5	12.5	13.5	13	13.5	13.5	14	-
	Triveni	G	93	88	88	85	83	82	75	70	61	40	-	-
		P	9.5	10.5	9.5	11	11.5	12	12	+++	-	-j	-	-
Rabi	Jyothi	G	96	94	93	93	89	80	75	39	30	15	-	-
		P	9.25	9.5	10	13	13.5	14	12	-	-	-	-	-
	Triveni	G	84	83	81	75	45	29	19	22	-	-i	-	-
		P	9.5	10	10	10	-	-	-	-	-	-	-	-

G - Germination per cent of the seed lot at the time of soaking (This also constitutes the control); P - Total period of 80 per cent viability retention of the seed lot from the date of harvest; *month; **fortnight

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REFERENCES

- Anonymous, 1976. International rules for seed testing. *Seed Sci. Technol.* 4 : 1-180
- Basu, R. N., Chattopadhyay, K. Pal, P. 1974. Maintenance of seed viability in rice (*Oryzasativa* L. and jute (*Corchorus capsularis* L. and *C. clitorius* L.) *Indian Agric.* 18(1) : 75-79
- Mohankumar, B. and Dev, V. P. S. 1988. Temporal and genotypic variations in the storability of rice (*Oryza sativa*) under the ambient conditions of Kerala. *Indian J. agric. Sci.* 58 : 283-9