NEFORD-CUTS International Collaboration

SANDA METHOD

The Best Option for Securing Harvest under Late Monsoon Condition

R.K. Singh, Rama Kant Singh, Nikhil Singh,
Santosh Mishra and Vinit Tripathi

NEFORD
Nand Educational Foundation for Rural Development
(Registered under Indian Societies Act, 1860)
Head Office: 1, Devlok Colony, Church Road, Vishnupuri, Aliganj, Lucknow, Uttar Pradesh (INDIA)
Mobile: 09721719736 • Phone: 91-522-4015742 • Fax: 0522-4015742
Website: www.neford.org • Email: rksingh.neford@gmail.com

SANDA METHOD
Securing Harvest under Late Monsoon Condition

Introduction :

In eastern U.P., agriculture is predominantly rainfed. Uncertainty of monsoon, recently, has further worsened the situation. Long-term (1901-2007) rainfall data analysis clearly showed that after 1980s, annual as well as seasonal rainfall has remained less than the normal. This is also well reflected by the pattern of percent deviation of decadal rainfall with mean during June, July, August & September (Table 1). Decline in rainfall during September has become more prominent after 2001. Thus, occurrence of early drought is now a regular feature, resulting in nursery raising problems, slow & stunted seedling growth and transplanting of aged seedlings. During kharif 2014, for instance, only about 34% farmers transplanted rice with less than 30-day old nursery, while about 50% farmers used older seedlings and 16% farmers, having no proper irrigation facilities, abandoned and burnt the nursery in field itself (Table 2).

NEFORD upgraded and tested the age-old practice of double transplanting, called 'Sanda Method' (also known as 'Kalam'). The technique seems to provide an excellent solution to problems arising due to delayed monsoon.

Table 1 : Percent deviation of decadal rainfall with mean (1901-2007)

Years	June	July	Aug.	Sept.	Years	June	July	Aug.
1901-10	-14.80		-1.37		-6.80		-6.47	
1911-20		28.16	-1.85			2.15	-2.01	
1921-30	-23.29			22.85		7.62		5.51
1931-40		28.11		6.15		4.97		5.93
1941-50	-5.33			4.76		19.58		0.30
1951-60		14.83		5.24		8.59	-8.36	
1961-70	-2.05			6.45	-1.22			10.71
1971-80		16.40		2.13	-0.73			1.60
1981-90	-1.48		-3.73		-8.23			9.27
1991-00	-30.47		-35.28		-20.82			26.37
2001-07	-2.11		-11.15		-26.71		-18.71	

Table 2. Age of seedlings at transplanting- 2014

Seedling age (Days)	Number of farmers	% of total farmers
<25	12	16.63
26-30	16	19.50
36-40	08	22.00
<40	12	14.63
Not transplanted/discarded	16	19.50
Total	**82**	**100.00**

Sanda/Kalam method : It is a technique of rice establishment, which involves double transplanting : first transplanting is done with 21/25-day old seedlings @ 8 to 10 seedlings per hill in close spacings (5-8 cm) in a small area and the second transplanting is done 30-35 days after the first transplanting using normal spacings.

Methodology : Seed bed preparation for seedling raising in Sanda method is done in the same way as for normally transplanted rice. Well cleaned 4 kg of seed is sown in 40m^2 nursery area, which is sufficient to transplant 1 ha area. The seedlings, aged 21-25 days, are uprooted and transplanted @8-10 seedlings per hill in close spacings, covering an area of 400m^2. The first close transplanted rice in small area, is easily maintained by irrigating the field, when stressed during early stage drought. After 30-35 days, the first transplanted rice is uprooted, roots are cleaned in water and seedlings and tillers are separated. The separated seedlings are re-transplanted using spacings recommended for transplanted rice @ 1 seedling per hill in 1 hectare area. The second time transplanted rice is cared for in the same manner as normal transplanted rice.

Field demonstration and farmers' experience : In May 2014, a group of 50 farmers were trained in Sanda Method. Out of these, 34 farmers, each having a piece of land of about one acre, were selected to conduct demonstration and given free of cost seeds of Moti variety. Farmers planted half of their field by sanda method and the other half by normal transplanting, and used fertilizers according to their capacity. As evident from table 3, Sanda method clearly showed its superiority over normal transplanting, both in terms of grain yield and agronomical N use efficiency. The increase in grain yield ranged between 0.41 and 0.94 t/ha with a mean of 0.73 t/ha. Also, agronomical N use efficiency (47%) in sanda method was higher than that of the transplanted rice (39.5%).

Cost of cultivation analysis also revealed that rice established using Sanda method, was more profitable than the transplanted rice; the net return in case of former was Rs; 32,610/- compared to only Rs. 15,062 / ha in the latter.

Table-3 : Paddy yield and agronomical N use efficiency in Sanda method and transplanted rice (Kharif 2014, 34 farmers)

N applied (kg/ha)	TPR Yield (t/ha)	SR Yield (t/ha)	Y difference due to SR(t/ha)	YA due to Sanda (%)	Agronomical N use efficiency	
					TPR (kg G / Kg N)	SR (kg G / kg N)
65N	2.99	3.84	0.85	28.4	49.8	59.1
80N	3.89	4.48	0.59	15.2	48.6	56.0
80N	3.18	3.76	0.58	18.2	39.8	47.0
90N	3.96	4.50	0.54	13.6	44.0	50.0
90N	4.02	4.43	0.41	10.2	44.7	49.2
100N	3.28	4.20	0.92	28.0	32.8	42.0
100N	3.54	4.48	0.94	26.6	35.4	44.8
105N	2.89	3.82	0.93	32.2	27.5	36.4
110N	3.6	4.38	0.78	21.7	32.7	39.8
Mean	3.48	4.21	0.73	21.6	39.5	47.1

TPR = Transplanted Rice; SR = Sanda Rice; kg G/kg N = kg grain / kg N applied

Table - 4 : Cost of cultivation (Rs) of Paddy under Sanda method and transplanting

S. No.	Items	Sanda Method	Transplanting
(A) 1	Cost of seed	120	1200
2	Seedling raising	205	820
(B)	1st close transplanting	1382.5	0
(C)	Main rice crop (1 ha)	17520	24420
(D)	Post harvest	12218	12218
	Total CC	31445.5	38658
(F)	Grain yield and return		
1	Yield (t/ha)	4.71	3.95
2	Gross return (Rs/ha)	64,056*	53,720
3	Net return (Rs/ha)	32,610.5	15,062

* Govt. procurement rate of Rs. 1360 per quintal rice was used for calculation.

Advantages :

Sanda method has several adgantages. Some of these are mentioned below:

- Requires less quantity of seeds (4 kg/ha), than the transplanted rice (40 kg/ha) and, thus there is a net saving of about Rs. 1,000 / ha.
- Escapes early stage drought during seedling and vegetative growth period (i.e. upto 50-55 days of crop duration). It is easy to maintain closely transplanted rice in small area with less quantity of irrigation water, which saves ground water, diesel for operating pump and man power.
- Generates more employment to farm families due to double transplanting.
- Needs less number of life saving irrigations (1-2 numbers), in case of drought during vegetative to maturity stages, while transplanted rice needs 5-6 irrigations to complete its life-cycle. Thus, Sanda method helps conservation of underground water for future use.
- Helps farmers to grow rice even under initial drought, because they can manage small Sanda plots with less water and their own resources. Thus, area coverage under rice is more, in spite of early stage drought which, in turn, increases total farm produce, employment and income.
- Suffers less due to false-smut and bacterial blight due to robust/stout plants.
- Avoids lodging, while in lowland condition the transplanted rice develops nodal tillers which promote lodging and yield loss.
- Needs less N fertilizer as per farmer's perception.
- Bears more number of tillers per hill, all tillers bear panicles, panicles are heavy; the grains are fully filled and test weight more,hence more yield.

Disadvantages :

Sand has two distinct disadvantages, firstly, it requires more number of labour for two transplantings, uprooting, cleaning and separation of seedlings; secondly, it suits only for long duration rice varieties like Moti, Swarna, etc. However, the increased cost of labour for two transplantings is much more compensated by the fact that sanda method requires less quantity of seeds, less number of life saving irrigations, no weed management and gives higher yields.

Conclusion :

Sanda method is a sure-shot option under condition of delayed rains as it offers an excellent strategy to avoid impact of early crop growth stage drought. Further, it saves ground water, enhances nitrogen use efficiency, reduces cost of cultivation and ensures high profit.

❐❐❐