OFT (SMS-Soil and Water Engineering)

- **Thematic area: Farm Machinery**
- **Problem definition/Name of OFT:** Assessment of different weeding tools in paddy crop

1.	Title of On farm Trial (OFT)	Assessment of different weeding tools in paddy crop
2.	Problem diagnosed	Traditional weeding method of paddy resulted high cost of cultivation
3.	Details of technologies selected for assessment/refinement (Mention either Assessed or Refined)	FP: Manually by local hand tools Technology Option II:- Manual inter culturing with Cono Weeder Technology Option III:- Inter culturing with power weeder
4.	Source of Technology (ICAR/ AICRP/SAU/other, please specify)	IGKV, Raipur, (C.G.)
5.	Production system and thematic area	7
6.	Performance of the Technology with performance indicators	Weed population (for 20 and 40 DAS(No./m2)**,** Weeding Efficiency 20 and 40 DAS, Man hours (h/ha), Cost of operation, **Yield q/ha, Increase in yield, Net Return (Rs./ha) and BC Ratio**
7.	Final recommendation for micro level situation	Adopt the modified power weeder for upland paddy at 20 and 45 DAS for efficient, cost-effective weed management, and enhanced economic returns.
8.	Constraints identified and feedback for research	• Manual labor-intensive methods incur high operational costs. • Optimize power weeder efficiency and field capacity. • Explore cost-effective measures for manual and power weeding. • Investigate reasons behind the weed population increase post-mechanical weeding.
9.	Process of farmers participation and their reaction	Positive response to the modified power weeder for its high efficiency and fuel-friendliness.

Results:

Weeds pose significant challenges in paddy production, with herbicides being a quick but environmentally and human health-adverse solution. To address these concerns, mechanical weeding, particularly using a modified power weeder, was tested for upland paddy at 20 and 45 days after sowing (DAS). The modified power weeder exhibited the highest Weeding Efficiency at 85.90% and 93.58% at 20 and 45 DAS, respectively, proving efficient and fuel-friendly (0.63 to 0.73 l/h). It performed comparably to the Cono weeder with weeding efficiencies of 62.04% and 72.36% at 20 and 45 DAS. The power weeder demonstrated cost-effectiveness at ₹1050/- per hectare, contrasting sharply with Cono weeder costs of ₹5040/- and ₹4672/- at 20 and 45 DAS. Hand weeding excelled in efficiency but incurred higher operational costs.

Table: Performance of Mechanical and Hand Weeding Methods and Economic Field Comparison of Different Treatments in Paddy.

Parameters		**Manually by local hand tools (T1)**	**Manual inter culturing with Cono Weeder (T2)**	**Inter culturing with power weeder (T3)**	**SEM (±)**	**CD (5%)**
Weed population (for 20 DAS(No./m2)	Before weeding	227	137	178	26.015	45.05
	After weeding	32	52	47	6.009	10.40
Weeding Efficiency 20 DAS		85.90	62.04	73.60	6.88	11.93
Weed population (for 40 DAS(No./m2)	Before weeding	187	123	167		
	After weeding	12	34	23		
Weeding Efficiency 40 DAS		93.58	72.36	86.23		
Effective field capacity (ha/h)			0.012	0.065		
Man hours (h/ha)	20 Das	227	96	17		
	40 Das	212	89	16		
Cost of operation	20 Das	11917.50	5040.00	1050.50		
	40 Das	10530.00	4672.50	940.00		

Yield Qt./ha	38.75	42.86	46.87		
Cost of Cultivation	41500	40500	38700		
Gross Income	84591.25	93563.38	102317.2		
Net Income	43091.25	53063.38	63617.21		
B:C Ratio	1.04	1.31	1.64		

Demonstration Field with Farmers

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Crop cutting done by KVK, Scientist

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