OFT (SMS-Soil and Warter Engineering)

- **Thematic area: Farm Machinery**
- **Problem definition/Name of OFT:** Assessment of low-cost Mulching in Vegetable Crop production

1.	Title of On farm Trial (OFT)	Assessment of low-cost Mulching in Vegetable Crop production
2.	Problem diagnosed	Evaluating low-cost mulching in vegetable production reveals variations in yield, costs, and profitability.
3.	Details of technologies selected for assessment/refinement (Mention either Assessed or Refined)	FP: No mulch Technology Option II:- Banana leaf mulch Technology Option III:- Crop Residue mulch
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	Soil temperature (°C) at 5 cm depth, weed density, Soil moisture, Yield q/ha, Increase in yield, Net Return (Rs./ha) and BC Ratio
7.	Final recommendation for micro level situation	Soil testing must be done before and after the application of biodegradable mulch to check its effect & Calculate weed population at different period.
8.	Constraints identified and feedback for research	1. Explore cost-effective alternatives to banana leaf mulch to enhance economic feasibility. 2. Investigate reasons behind the negligible yield increase without mulching. 3. Assess the long-term impact of different mulching options on soil health and crop resilience.
9.	Process of farmers participation and their reaction	Farmers adopting banana leaf mulch may express satisfaction with increased yields and returns.

Results: The Results shows that banana leaf mulch had the highest yield per hectare (168.82 q/ha) compared to no mulch (127.69 q/ha) or crop residue mulch (156.48 q/ha). It also had the highest increase in yield (24.36%), followed by crop residue mulch (18.40%) and then no mulch (0%). The cost of cultivation was highest for banana leaf mulch (92000 Rs/ha), followed by crop residue mulch (89600 Rs/ha) and then no mulch (88560 Rs/ha). The gross return was highest for banana leaf mulch (303876 Rs/ha), followed by crop residue mulch (281664 Rs/ha) and then no mulch (229842 Rs/ha). The net return was also highest for banana leaf mulch (211876 Rs/ha), followed by crop residue mulch (192064 Rs/ha) and then no mulch (141282 Rs/ha). The benefit cost ratio was highest for banana leaf mulch (2.30), followed by crop residue mulch (2.14) and then no mulch (1.60).

Demonstration Field with Farmers and Crop cutting done by KVK, Scientist

Banana leaf and crop residue mulch

Cauliflower crop with mulching

Table: The Assessment low-cost Mulching **incorporation on yield & economics of** Vegetable Crop production**.**

Treatments	Yield q/ha	Increase in yield	Result: Cost of cultivation	Gross return (Rs./ha)	Net Return (Rs./ha)	BC Ratio
No mulch	127.69	Nil	88560	229842	141282	1.60
Banana leaf mulch	168.82	24.36	92000	303876	211876	2.30
Crop Residue mulch	156.48	18.40	89600	281664	192064	2.14
SEM (±)	12.185					
CD (5%)						

Table: Soil temperatures: Soil temperature (°C) at 5 cm depth

Treatments	3 days after sowing			30 days after sowing			60 days after sowing		
	8:00 AM	12:00 PM	5:00 PM	8:00 AM	12:00 PM	5:00 PM	8:00 AM	12:00 PM	5:00 PM
FP: No mulch	**14.27**	**18.12**	**17.08**	**17.25**	**19.42**	**18.54**	**21.25**	**24.45**	**23.45**
TO1: Banana leaf mulch	**16.35**	**20.35**	**19.13**	**20.24**	**22.52**	**21.85**	**24.56**	**28.54**	**27.14**
TO2: Crop Residue mulch	**15.84**	**19.25**	**18.14**	**19.85**	**20.54**	**20.12**	**22.84**	**26.85**	**25.56**

Table: Total weed density (numbers of weeds per square meter) and Soil moisture:

	Weed count (No. of weeds/ m^2)		Soil moisture (%)	Percent soil moisture increased
Treatments	**30 days**	**60 days**	**15 cm Depth**	
FP: No mulch	**68**	**74**	**9.85**	**-**
TO1: Banana leaf mulch	**24**	**48**	**13.65**	**22.65**
TO2: Crop Residue mulch	**35**	**56**	**12.24**	**18.35**