

Perception of Oil Palm Growers on Ablation Tool Performance in Oil Palm Cultivation

M V Prasad, T Vidhan Sing H, S Shivashankar and Ananta Sarkar

ICAR-Indian Institute of Oil Palm Research, Pedavegi, A. P.

ABSTRACT

The process of removing of unopened inflorescence during 1-3 years after planting of oil palm is called Ablation. Most of the farmers either ignore or partially practice ablation, which will affect the growth and yield. Ablation tool was developed by ICAR-Indian Institute of Oil Palm Research for removal of inflorescence during 1-3 years. Farmers are using ablation tools in their oil palm plantations during juvenile period to remove inflorescence. The present study was conducted to know the perception of oil palm growers about the performance of Ablation tool. A structured interview schedule was administered to 34 randomly selected ablation tool users. Results indicated farmers used ablation tool in 2-4 years age oil palm plantations. Tool was operated in an area of 2 ha. Farmers used ablation tool for more than 1 year. Respondents perceived tool is good. Ablation tool users found that tool is easy. Cent percent tool users responded that tool is useful, does not have any complications while using, less energies used, comfortable, safe, no damage to plant, angle is good and weight of ablation tool is satisfactory. Ablation tool can be operated satisfactorily from a distance of 2 meters from plant and U shaped wedge is appropriate for removing inflorescence. They revealed that, one person could operate in 0.8 ha in a day. Users took 1 minute time for removing one inflorescence. Users revealed that ablation tool doesn't require any modifications.

Key words: *Ablation tool, Oil Palm, Perception and Removal of inflorescence.*

Oil Palm is cultivated in an area of 3.45 lakh hectares in India. India has potential to grow oil palm in an area of 19.33 lakh (Rethinam et al, 2012). Oil Palm is monoecious crop, both male and female inflorescences are produced separately on the same palm. Each leaf axle has one floral bud which differentiates into male or female inflorescence.

The early development of inflorescence takes two and half years to three years (Fig.1), during that period, it emerges from leaf axle shortly before anthesis. Inflorescence is a compound spike or spadix held on a stout peduncle, bears two large inflated bracts (spathes) which encircled the whole inflorescence.

Inflorescences contain thousands of flowers. Flower opening starts first in the basal spikelets' of the inflorescence. The removal of male and female inflorescences and fruit bunches produced during the juvenile period (1-3 years after planting) is called ablation. Ablation improves the vegetative growth of palm by retaining the nutrients which are supposed to be used by developing inflorescences or fruit bunches. It also improves drought resistance capacity of young palms by improving shoot and root growth especially in low production areas where dry conditions exist (Ramachandrudu and Manorama, 2013). Ablation must be done at monthly intervals by removing young unopened inflorescences. Most of the farmers are not

practicing ablation, either practicing partially or ignoring it at different stages, there by vegetative growth of juvenile palms are affected and lead to poor growth and yields. Due to non practicing of ablation, regular bearing of bunches and harvesting is not commencing even after completion of 3½ or 4 years after planting of oil palm. Non practicing of ablation during juvenile period could be due to presence of intercrop in oil palm plantation which makes difficult to reach each palm crown and do ablation.

Farmers seldom practice ablation either by chisel or long handle knife. Inflorescence is cut with a chisel or knife from the base of the inflorescence peduncle. While practicing in this manner, many leaves are cut leaving palms with few numbers of leaves. Also while ablation leaf spines are piercing into skin causing injury on the hands of operator. Possibility of snake bite is also a threat while doing ablation and hence it is generally avoided. Hence with the above factors in mind it necessitated to develop an appropriate tool which will have less drudgery, no damage to leaves, safe and maneuverable during intercrop period (Prasad et. al., 2018). Ablation tool was developed by ICAR-Indian Institute of Oil Palm Research and was made available to oil palm growers. A study was conducted with an objective to know the perception of ablation tool users (oil palm growers).

MATERIAL AND METHODS

Among the ablation tool users 34 oil palm farmers were selected randomly for the study. A structured interview schedule was prepared by keeping the relevant items to study the performance of ablation tool, as perceived by the respondents i.e. oil palm growers. Interview schedule consisting of the variables viz., age of plantations, area of oil palm plantation, ablation tool usage duration, usefulness of ablation tool, ease of ablation, ablation tool

performance on different parameters, distance from plant while using tool, appropriateness of U shaped wedge, extent of area ablated, time taken for ablation, modifications required in the tool and suggestions was prepared. Interview schedule has been administered to 34 randomly selected ablation tool users and collected data. Data collected on performance of ablation tool as perceived by the ablation tool users was compiled, analyzed with the help of relevant statistical tools. For measuring independent and dependent variables frequency and percentage was used. To understand the relationship between dependent and independent variables Spearman correlation coefficient was used.

RESULTS AND DISCUSSION

Results obtained on the parameters studied on performance of ablation tool as perceived by oil palm growers are furnished below, inferences drawn and concluded.

Age of plantations

Majority of the farmers (50%) used ablation tool in their 4 years oil palm plantations (Fig. 2), followed by 3 years old plantations (29%), 5 years plantations (15%) and 2 years or >5 years old oil palm plantations (3%). Eighty two percent farmers are using ablation tool in their 2-4 years old oil palm plantations. They perceived that ablation is required for proper growth and girth of plant. Hence farmers are using ablation tool till the plantation attains 4 years age. They are continuing to do ablation beyond 4th year, to have good equal growth of all palms in the plantation.

Area of Oil palm plantations

Majority of the farmers (59%) are using ablation in an area of ≤ 2 ha, followed by >2 ha area (41 %) (Table 1). Results indicate that small and

medium land holding oil palm growers are using ablation tool.

Table 1. Area of Oil Palm Plantations N=34

Area (ha)	Frequency	Percentage
≤2	20	59
>2	14	41
Total	34	100

Duration of Ablation tool usage

Oil palm growers (56%) are using ablation tool for more than 1 year, followed by 44% farmers are using ≤ 1 year (Table 2). Majority of the oil palm growers started using ablation for the last couple of years, since the tool has been made available to the farmers by ICAR-IIOPR since four years.

Table 2. Ablation tool usage duration N=34

Year	Frequency	Percentage
≤1	15	44
>1	19	56
Total	34	100

Usefulness of Ablation tool

Ablation tool users (38%) perceived that tool is good, 32% perceived that tool is excellent, 24% felt that tool is very good, followed by satisfactory (6%) (Table 3). Majority of the tool users are satisfied with it's performance in removing inflorescence during 1-4 years age of oil palm plantations, when compared to other tools used for removal of inflorescence.

Table 3. Extent of usefulness of Ablation tool

N=34

Category	Frequency	Percentage
Excellent	11	32
Very good	8	24
Good	13	38
Satisfactory	2	6
Non satisfactory	0	0
Total	34	100

Ease of Ablation

Majority of oil palm growers (97%) using ablation tool perceived that it is easy to do ablation with the ICAR-IIOPR developed tool (Table 4). Only 3 % felt that it is not so easy to do ablation with the ablation tool. Results indicate that the continuous use of ablation tool may give experience and result in ease in removal of inflorescence with ablation tool. They observed that many green leaves have been cut while removing inflorescence with chisel. They perceived no leaf is cut by using the ablation tool developed by ICAR-IIOPR.

Table 4. Ease of ablation N=34

Category	Frequency	Percentage
Easy to do ablation	33	97
Not so easy to do ablation	1	3
Total	34	100

Feedback on tool performance

Cent percent farmers opined tool is useful (Table 5) and does not have any complications while using ablation tool. This tool is operated with less energy. Comfortable to use the tool in 1-3 years age plantations, safe, no damage to plant, angle is good and weight of ablation tool is satisfactory. This indicates satisfactory performance of ablation tool to do ablation in juvenile period.

Distance from plant while using Ablation tool

Majority of the respondents (82%) revealed that operating ablation tool from a distance of 2 meters is satisfactory followed by (18%) 3 meters distance (Table 6). Result obtained indicates that more the distance from palm, will have more discomfort to do ablation. Probably holding of tool and posture would have been comfortable to do ablation from 2 m distance.

Table 5. Feedback of farmers on different parameters of ablation tool performance. N=34

Category	Frequency	Percentage
Tool is useful	34	100
Used without complications	34	100
Less energy used for ablation	34	100
Comfortable to use the tool	34	100
Safe to use	34	100
No damage to plant	34	100
No damage to leaves or leaves are not cut while using ablation tool	34	100
Angle is good while using ablation tool	34	100
Weight of Ablation tool is satisfactory	34	100

Table 6. Satisfactory distance from plant while using tool N=34

Distance(meters)	Frequency	Percentage
2	28	82
3	6	18
Total	34	100

Shape of Ablation tool

Results from Table 7, revealed that majority of the respondents (76%) perceived U shaped wedge at the end was appropriate for operating ablation tool for removing inflorescence, while 24% revealed it requires little change. One can get appropriate angle of insertion, based on the space at the end shape of U shaped wedge of ablation tool. Based on the age of the palm, leaf and inflorescence arrangement in the crown, will give appropriate space to do ablation.

Table 7. U shaped wedge is appropriate N=34

U shaped wedge	Frequency	Percentage
Appropriate	26	76
Requires little change	8	24
Total	34	100

Extent of area ablated

Majority of the respondents (44%) revealed that, they have operated in an area of 0.8 ha, followed by 1.2 ha (29%) and >1.2 ha (27%) of oil palm plantation (Table 8). This may be due to age of the

plantation, number of inflorescence present in the crown and arrangement of inflorescence in the crown region. Area of ablation depends on search for inflorescence in a given area and intactness of leaf base in the crown region.

Table 8. Extent of area ablated (ha/ day/ man) N=34

Area (ha)	Frequency	Percentage
0.8	15	44
1.2	10	29
>1.2	9	27
Total	34	100

Time taken for ablation

Majority of the respondents (79%) took 1 minute time for removing one inflorescence, 15% respondents ablated 2 inflorescence in a minute, followed by 6% respondents ablated 3 inflorescence in a minute (Table 9). This may be due to age of the palm, size of inflorescence and placement of inflorescence in the leaf axle.

Table 9. Time taken for ablation N=34

No. of inflorescence / min	Frequency	Percentage
1 inflorescence/min	27	79
2 inflorescence/min	5	15
3 inflorescence/min	2	6
Total	34	100

Modifications required in Ablation tool

Majority of the respondents (91%) revealed that ablation tool doesn't require any modifications, while 9% respondents perceived modification in U shape hook (Table 10). This may be due to individual preference, maneuverability and angle of insertion while doing ablation in different age plantations.

Table 10. Modifications required N=34

Modifications required	Frequency	Percentage
Required at U- shape hook	3	9
Not required	31	91
Total	34	100

Suggestion to improve Ablation tool

Respondents suggested modifications in the following orders viz., U shape flat must be sharp (9%), U shape flat is breaking, it should be thick (6%) and U shape flat angle should have inward curve (6%) (Table 11). This perception could be due to preference, over the other tools used for ablation during juvenile period of oil palm plantations. Since majority (91%) inclined to keep the present shape the tool doesn't require major modifications. Also modifications may be individual preference at the instance of ablation operation.

Table 11. Suggestions N=34

Suggestions	Frequency	Percentage
U shape flat is breaking, it should be thick	2	6
U shape flat must be sharp	3	9
U shape flat angle should have inward	2	6

Relation between dependent and independent variables

Data depicts that most of the independent variables have constant value (same) for all the respondents except three variables viz. Distance, U shaped wedge and modifications (Table 12). Two variables Time taken to ablate number of inflorescence per minute and Inflorescence ablated per person per day in a hectare were considered dependent variables. These variable takes either ordinal values or count data, therefore, spearman correlation coefficient was obtained using SAS 9.3 software to understand the linear relationship. The results indicated that the independent variables are not significantly linearly related to the dependent variables at 5 percent level of significance.

Table 12. Spearman Correlation Coefficients among dependent and independent variables.

N = 34

	Time taken to do ablation	Inflorescence ablated area per day per man
Distance	0.1228 (0.4890)	0.0751 (0.6728)
U shaped wedge	-0.2709 (0.1213)	0.0413 (0.8168)
Modifications	0.1575 (0.3736)	0.1627 (0.3580)



Fig. 1. Unopened inflorescence of 2½ to 3 years oil palm plantation

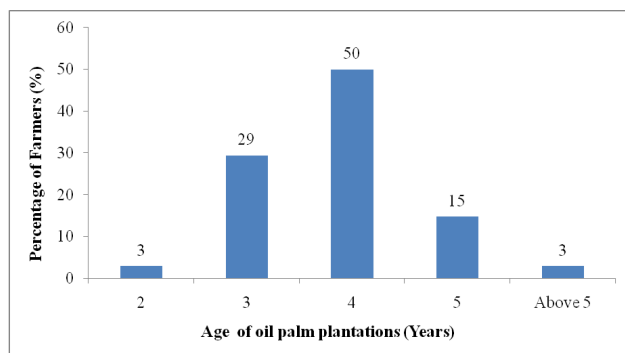


Fig 2. Farmers using ablation tool in different age of oil palm plantations (N = 34)

CONCLUSION

Farmers perceived that ablation tool is developed by ICAR-IIOP Ruseful, operation is easy to do ablation, does not have any complications while using, less energy used for ablation, comfortable, safe, no damage to palm, angle is good and weight of ablation tool is satisfactory. Farmers revealed that operating ablation tool from a distance of 2 meters distance is satisfactory, they revealed that U shaped wedge is appropriate for operating ablation tool for removing inflorescence. One person could operate in an area of 0.8 ha in a day, tool operators had taken 1 minute time for removing one inflorescence. Tool users revealed that ablation tool doesn't require any modifications. Thus ablation tool is useful, safe, observed satisfactory performance in 1-3 years oil palm plantations to remove unopened inflorescence, without damaging green leaves with less drudgery. The tool can be used at regular intervals during juvenile period for better growth and yield of oil palm plantations.

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