

**EFFECT OF HARVEST AT DIFFERENT INTERVALS ON THE
GRASS AND OIL YIELD AND CITRAL CONTENT IN LEMONGRASS**
(*Cymbopogon flexuosus* stapf)

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Lemongrass is an important essential oil yielding crop of Kerala. It is a perennial crop and the harvesting is done by cutting the grass at periodical intervals. Guenther (1949) reported that the time of cutting exert a considerable influence on the yield and quality of oil. There is also a belief among the lemongrass cultivators of Kerala that both immature and overmatured grass give less quantity of oil and that there is a proper stage at which the grass is to be cut for optimum yield. The above study was thus contemplated to determine the effect of different intervals of harvest on the yield and citral content and find out the proper stage of grass for the maximum yield of oil of high citral in the local cultivated variety of lemongrass.

Materials and Methods

A field experiment was laid out at the Lemongrass Research Station, Odakkali in a Randomised block design. Harvesting was done at intervals of 30 to 35, 40 to 45, 50 to 55 and 60 to 65 days intervals. Each lot was replicated 6 times.

Rooted slips of a local variety of grass were transplanted at a spacing of 20 cm x 20 cm. in lines with 2 slips per hill. During the 1st year the first harvest of the grass was made 90 days after planting and subsequent harvests were done as per the schedule of treatments except during the summer months from February to April when the leaves and shoot were dried up. Immediately after the summer months with the onset of the rains by the end of May or early June the new shoots and leaves that came up from the basal portion were given a uniform cutting at 4 - 5" above the ground level on the same day in all the treatment plots and subsequent harvests made at intervals as per the treatments. Grass yield, oil yield and citral percent of oil were determined by the sodium bi sulphite method, The percentage recovery of oil was also worked out for each treatment. The quantity of oil obtained per unit quantity of grass is given as the percent recovery of oil. It is usually expressed as the oil obtained in litres/100 kgm. of grass distilled.

Results and Discussion

Results are presented in tables 1, 2 and 3. The effects due to treatments were significant for grass yield, 60-65 days interval recording the highest grass

Table 1.
(Mean yield of grass in M. ton/ha)

Treatments.	63-64	64-65	65-66	66-67	Mean value treatment	F. Test	C. D. at 00.5
1. 30-35 days	9.763	33.477	24.303	15.189	20.683		
2. 40-45 „	10.191	37.224	31.523	20.309	24.812		
3. 50-55 „	10.071	39.523	28.286	20.286	24.541	Significant	1.933
4. 60-65 „	8.0	43.737	29.763	22.049	25.887		

yield. The treatment 30-35 days was inferior to the rest of the treatments. The effect of different intervals of harvest on the oil yield was significant, 40-45 days interval recording the highest yield. The yield difference between 40-45 and 50-55 days were not significant. As far as the percentage recovery of oil (oil yield/unit quantity of grass) was concerned 30-35 days treatment recorded a slight increase over the other treatments.

There was significant increase in citral content of oil for each interval of harvest over the previous one, 60-65 days treatment recording the highest citral.

Table 2.
(Mean yield of oil (litre/ha) and % recovery.)

Treat- ments	63 64		64-65		65-66		66-67		Mean		F. test.
	Oil yield	% recovery	Oil yield	% recovery	Oil yield	% recovery	Oil yield	% recovery	Oil yield	% recovery	
1. 30-35 days	25.06	0.26	104.04	0.31	88.29	0.36	43.10	0.29	65.12	0.32	
2. 40-45 days	25.05	0.25	105.66	0.28	104.95	0.33	53.98	0.27	72.14	0.29	
3. 50-55 days	25.48	0.28	113.08	0.29	89.29	0.32	89.29	0.24	79.29	0.28	Signi- ficant
4. 60-65 days	18.05	0.20	97.59	0.22	82.86	0.28	82.86	0.18	70.34	0.23	

The results of the experiment described above showed that different intervals of harvest have got marked influence on the yield. 60-65 days interval between harvests gave the maximum grass yield per year. In the case of 30-35 days even though more number of harvests (almost double) could be obtained the quantity of grass obtained per harvest was very small Which contributed to low yield per year.

Table 3
(Mean citral percent in oil)

Treatment	63-64	64-65	65-66	66-67	Mean	F. Test & C. D.
1. 30-35 days	77.58	73.77	76.05	72.05	74.86	Significant
2. 40-45 "	79.50	80.60	82.63	78.67	80.28	005
3. 5-55 "	83.93	81.48	82.70	82.70	82.55	C. D. 1.04
4. 60-65 "	85.33	81.57	84.73	82.83	83.62	

The oil yield was also influenced by the interval of harvests. 40-45 days interval between harvests gave the maximum yield of oil but there was no significant difference between the treatments, 40-45 days and 50-55 days. Beyond 50-55 days, reduction in oil yield was noticed. Even though the total oil yield was comparatively low, 30-35 days treatment recorded highest percentage recovery of oil. This shows that within 30-35 days sufficient quantity of oil has formed in the leaves and shoots and that the low oil yield per year was only due to the low grass yield. A gradual reduction in the recovery percentage of oil was noticed with the increase in maturity of grass which showed that after a particular stage of growth of the crop there was no increase in oil content for the corresponding increase in foliage.

The citral content in oil as influenced by the harvest interval showed that oil obtained from 60-65 days treatment recorded highest citral followed by 50-55 days. Citral content is thus found to be positively correlated to the age of the grass unlike in the case of oil content.

Summary

An experiment was conducted at the Lemongrass Research Station, Odakkali for 4 years from 63-64 to 66-67 to study the effect of different intervals of harvest, on the yield of grass, oil content of lemongrass and the citral. Significant difference was noticed in the yield and citral content due to the treatments. The optimum interval between harvests for better yield and quality oil was found to be 45-55 days.

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REFERENCE

Guenther, E. 1949 Essential oils Vol IV Second Edition