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# Evaluation of the herbage yield and oil quality of mint along with compute the economics of different treatment combination

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**Abstract**
The present investigation was carried out at Main Experimental Station, College of Horticulture, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during the Year 2017. The experiment was laid out in randomised complete block design replicated thrice with Eleven different treatment. Experiment revealed that the maximum fresh herbage yield, dry herbage yield, oil yield was recorded with the with the application of Press mud (30 t/ha). From over all experimental results, it is concluded that higher economic return can be obtained from higher dry herbs yield of Mint with the application of Press mud (30 t/ha). The present finding gained significance particularly in the present context i.e., increasing awareness of farmers for use of various organic manures doses for increasing oil yield of important medicinal plants (Mint and others).

**Keywords:** Mint, quality, oil, herbage yield, press mud

## Introduction
Japanese mint (*Mentha arvensis* L.) cv. Kosi belongs to the family Lamiaceae (Labiate). Brazil is the native place of Japanese mint. Japanese mint in India has reached out to all most all the households and has made a major impact because of the qualities present in it. India is the leading consumer of Japanese mint oil. Sauces are made from mint leaves. Major trade centres of mint oil in India are Sambhal, Barabanki, Rampur, Chandausi, Badaun, Bareilly and Moradabad. The production and productivity of Japanese mint in India is very low as compared to many countries. It may be due to many factors responsible for low yield. The mint is a vigorously growing branched, hardy perennial, attaining up to 1m height in rich fertile lands. The herb is covered with sort tomentum all over and bears broadly ovate leaves over terete, violet tinged quadrangular stems. It gives out long narrow, axillary flowering spikes profusely, containing lilac flowers. Many metabolites have been found to protect plants against viruses, bacteria, fungi and importantly against herbivores. The oil has high menthol content (75-80%). The newly bred culture Konsi, yields more oil and menthol contents than Himalaya and Shivalik. Plant requires favourable soil and climatic condition for development of plant. The yield and oil quality of herbs are highly affected by agricultural practices. Farm yard manure is the most common organic manure used in the horticultural, medicinal and aromatic crops for supplement the initial requirement of nutrients for better establishment and plant growth.

## Method and Material
The experimental was carried out was carried out at Main Experimental Station, College of Horticulture, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during the year 2017. Different treatment was used in randomized block design with three replications with an optimum plot size 4.02x3.15 $m^2$ and spacing of 60cm row to row and 45cm plant to plant. Observation on Yield and quality characters *viz.*, Fresh herbs yield (q/ha), Dry herbs yield (q/ha) and Oil yield (lit/ha) were recorded after harvesting of the plants. and Economics Character *viz.*, Gross return (Rs. /ha), Net return (Rs. /ha) and Input and output ratio (Rs.).

The experimental site is located under humid subtropical climate condition having three climate seasons i.e., summer, rainy and winter and annual rainfall distribution was recorded 120 cm and relative humidity 63.15%. The observation was recorded 90 days after transplanting (at harvesting time). Five plants were randomly selected from each plot and tagged for recording the observations and average of these five plants were taken for the study.

## Result and Discussion

### Effect of different organic sources in yield and oil quality

**Herbage yield:** Data pertaining to fresh herbage yield as influenced by the application of various organics doses, higher fresh herbage yield (270.00 q/ha) has been achieved by the application of Press mud (30 ton/ha) compared to other organics treatments combination and control (157.50 q/ha). Significantly higher fresh herbage yield was in treatment Press mud (30 ton/ha) might be due to increase of fresh herbage yield attributing characters *viz*, plant height, plant spread, diameter of stem and number of branches. The beneficial response of Press mud on the herbage yield have also been reported by other workers reported that FYM and inorganic fertilizer in different ratio on essential oil and herb yield of mint studies on effect of lime and FYM in different combination of mint, study the effect of different level of combined doses of nutrients on herb and oil yield of mint. Chand *et al*. (2001) [1], Prabu *et al*. (2012) [2].

**Oil yield:** Data on oil yield indicated that significant variation observed due to various organics doses. The maximum oil yield (204.36 lit/ha) was obtained due to application of Press mud 30ton/ha. The higher oil yield through Press mud 30ton/ha might be due to higher the foliage resulting higher the oil yield as similar results were observed in case of fresh herbage yield. Similar results were observed, reported that FYM and inorganic fertilizer in different ratio on essential oil and herb yield in (Mentha arvensis L.) cv. HY77, Chand *et al.* (2001) [1], Prabu *et al.* (2012) [2].

### Effect of different treatment combination on mint economics

The acceptance of any agricultural recommendation will depend upon its benefit: cost ratio and recommendation pertaining to scientific crop management will not be adopted by the farmers unless treatments are not economically viable. In this connection, the economic analysis of various organic manures treatments in present investigation showed that highest cost of cultivation was worked out under T 7 treatment (Press mud 30 t/ha). This was mainly due to higher inputs as well as more cost of press mud. However, maximum gross return was obtained under T 7 treatment (Press mud 30 t/ha). The net return per rupee investment (2.66) was computed higher due to T 11 Press mud 25 t/ha + PSB 12 kg/ha because of attributing of higher dry herbage yield as well as lower cost of cultivation (lower cost of FYM). Similar results were observed by Suresh *et al.* (2012) [4], Kumar *et al.* (2011).

**Table 1:** Effect of different organic sources in fresh herbage yield (q/ha)

| Treatments | Fresh herbage yield (q/ha) | Dry herbage yield (q/ha) | Oil yield (lit/ha) |
|---|---|---|---|
| $T_1$ Control | 157.50 | 33.08 | 119.21 |
| $T_2$ FYM 25 t/ha | 220.50 | 46.31 | 166.89 |
| $T_3$ FYM 30 t/ha | 227.25 | 47.72 | 172.00 |
| $T_4$ Vermicompost 6 t/ha | 209.25 | 43.94 | 158.38 |
| $T_5$ Vermicompost 8 t/ha | 240.75 | 50.56 | 182.22 |
| $T_6$ Pressmud 25 t/ha | 254.25 | 53.39 | 192.44 |
| $T_7$ Pressmud 30 t/ha | 270.00 | 56.70 | 204.36 |
| $T_8$ Biofertilizers (PSB) 12 kg/ha | 204.75 | 43.00 | 154.97 |
| $T_9$ FYM 25 ton/ha + PSB 12 kg/ha | 218.25 | 45.83 | 165.19 |
| $T_{10}$ Vermicompost 6 t/ha + PSB 12 kg/ha | 211.50 | 44.42 | 160.08 |
| $T_{11}$ Pressmud 25 t/ha + PSB 12 kg/ha | 157.50 | 54.81 | 197.55 |
| S.Em± | 8.25 | 2.08 | 6.60 |
| CD at 5% | 24.34 | 6.17 | 19.62 |

**Table 2:** Economics of the different treatment combinations.

| Treatments | Total cost of cultivation | Gross return (Rs. /ha) | Net return (Rs. /ha) | Cost benefit ratio |
|---|---|---|---|---|
| $T_1$ | 31400 | 95368 | 63968 | 1:3.03 |
| $T_2$ | 47650 | 133512 | 85862 | 1:2.80 |
| $T_3$ | 50900 | 137600 | 86700 | 1:2.70 |
| $T_4$ | 61400 | 126704 | 65304 | 1:2.06 |
| $T_5$ | 71400 | 145776 | 74376 | 1:2.04 |
| $T_6$ | 56400 | 153952 | 97552 | 1:2.72 |
| $T_7$ | 61400 | 163488 | 102088 | 1:2.66 |
| $T_8$ | 32600 | 123976 | 91376 | 1:3.80 |
| $T_9$ | 48850 | 132152 | 83302 | 1:2.70 |
| $T_{10}$ | 62600 | 128064 | 65464 | 1:2.04 |
| $T_{11}$ | 57600 | 158040 | 100440 | 1:2.74 |

## Conclusion

The present investigation, we concluded that maximum fresh herbage yield, dry herbage yield, oil yield was recorded with the with the application of Press mud (30 t/ha), While higher economic return can be obtained from higher dry herbs yield of Mint with the application of Press mud (30 t/ha).

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