Cash crop pdf

(1)

POTATO (Solanum tuberosum)

Family: Solanaceae

Origin

The probable centre of origin of potato is in South America in the central Andean region. Evidence indicates that potatoes were cultivated for centuries by South American Indians and the tubers were used as a common article of food.

Varieties/Hybrids

Kufri Alankar

It is a derivatives of the cross (Kennebee x O.N .2090) x

(Majestic x Ekishiraju), released in 1968 by Central Variety Release Committee for plains of Punjab, Haryana and Western Uttar Pradesh and specially suited for sandy soils.

Kufri Anand

A derivative of PJ376 x PH/F 1430, released from CPRI, Shimla in 1999.

KUFRI Ashoka

It is a wider adaptable variety released from CPIU, Shimla in 1996. It is a derivative of (EM/C-l 020 x Allerfi'uii lleste Gelbe).

Kufri Badshah

It is a cross of Kufri Jyoti and Kufri Alankar and released in 1980 by Central Sub Committee on release in varieties for Indo - gangetic plains of North India, including Punjab, Haryana, Uttar Pradesh, Bihar, West Bengal, Madhya Pradesh and Plateau region.

Kufri Bahar

It is a derivative of the cross Kufri Red x Ginek and released by :! Central Sub-Committee on Release of Varieties in 1980 for the plains of Haryana, Punjab and Western Uttar Pradesh.

Kufri Chamatkar

A derivative of the cross *Ekishiraju x Phulwa* and released in 1967 by Central Variety Released Committee for the plains 01 Uttar Pradesh, Madhya Pradesh, Haryana, Punjab, where one crop of long duration is raised.

Kufri Chandramukhi

It is a derivative of the cross S.4485 X Kufri Kuber and released in 1967 in Central Variety Release Committee for the plains of Punjab, Haryana, Uttar Pradesh, Madhya Pradesh, Rajasthan, Bihar, West Bengal and Maharashtra.

Kufri Chipsona-L

It is a cross of MEX.750826 x MS/78- 79 and released from CPRI, Shimla in 1998.

Kufri Chipsona-2

It is a derivative of F-6 x QB/B-92-4 and released from CPRI, Shimla in 1998.

Kufri Dewa

It is a derivative of the cross Craigs Defiance x Phulwa and released by Central Sub-Committee on Release of Varieties in-1973 for Tarai area of Uttranchal and Shimla agroclimatic conditions. It is also suitable for Bihar and Orissa.

Kufri Giriraj

It is north and south India adaptable variety. It is a cross of SLB/1-132 x EX/A 680-16 and released from CPRI, Shimla in 1998.

Kufri Himalini

It is a derivative of cross SLB/H-140 x SLB/Z-389 (b) Recommended by 9th workshop of the All India Coordinated Potato Improvement Project for Hilly regions (hills of Northern

India and Nilgiris in South) in the country.

Kufri Jawahar

It is a derivative of Kufri Neelamani x Kufri Tyoti and released from Central Potato Research Institute, Shimla in 1996.

Kufri Jeevan

It is a derivative of the cross M-I09-3 x D 698 and adopted for northwest hills of Himachal Pradesh and Uttar Pradesh.

Kufri Jyoti

It is a derivative of the cross 3069d(4) x 2814 Q (1) and released in 1968 by the Central Variety Release Committee for Himachal Pradesh and Kumaon Hills of Uttranchal and also plains where late blight is a limiting factor.

Kufriu Khashigaro

It is popular variety of hilly region and a derivative of the cross Taborky x SD 698 D.lt is adapted to hilly regions of Assam.

Kufri Lali.Ma

It is a fast bulking variety and a derivative of the cross Kufri Red x CP 1362, which released in 1982 by Central Sub-Committee on Release of Varieties for the plains of Uttar Pradesh, Bihar, West Bengal, Orissa and Karnataka States.

Kufri Lauvkai

It is a derivative of cross Serkoy x Adina released in 1973 by Central sub-committee on Release of Varieties for Decan Peninsula (Maharashtra).

Kufri Muthu

It is a derivative of the cross 3046(1) x M-l09-C and released in 1971 by Central Sub Committee on release of Varieties for Nilgiri Hills for summer and autumn seasons.

KUFRI Naveen

It is a derivative of the cross 0-692 x, 3070d (4) and adapted to northeast hills of Assam and high altitude of Himachal Pradesh.

Kufri Pukhraj

It is a wider adaptable variety and a cross of Craig's Defiance x JEX/B-687, which released in 1998 from CPRI, Shimla.

Kufri Sheetman

It is a derivative of the cross Craig Defiance x Phulwa, released in 1968 by Central Variety Release Committee for plains, especially frost affected areas of Punjab, Rajasthan, Haryana and Western Uttar Pradesh.

Kufri Sherpa

It is a derivative of the cross Ultimus x Adina and recommended for cultivation in the hills to West Bengal State by 9th Workshop of All India Coordinated Potato Improvement

Project.

Kufri Sindhuri

It is derivative of the cross Kufri Kundan x Kufri Red and released by Central Variety Release Committee in 1966 for plains of Punjab, Jammu, Orisa, Bihar, Haryana, Uttar Pradesh, Madhya Pradesh and West Bengal.

Kufri Sutlej

It is a derivative of Kufri Bahar x Kufri Alankar and released in 1996 from CPRI, Shimla.

Kufri Swarna

It is a cross of Kufri Jyoti x (VIn) 2 (62.33.3) and released in tile year of 1985 from CPRI, Shimla.

Climatic Requirements

Potato is basically cool season crop. It grows well from sea level to snow line, where sufficient moisture and fertile soil are available. It is grown in winter in plains of India. However, in northern hills, it is grown as summer season crop. Potato is a long day plant but cultivated as~ day plant. It requires favourable environmental conditions such as low temperature and short day conditions at the time of tuberization for rapid bulking rate. About 20 °C temperature is good for tuber formation and it reduces as the temperature increases. Tuberization is badly affected at about 300C temperature. At higher temperature, the respiration rate increases and the carbohydrates produced by photosynthesis are consumed rather than stored in tuber. High temperatures at any part of growing

period affect the size of leaflets, thereby reducing the tuber formation. It grows best under long day conditions sunshine along with cooler nights are essential for reducing the spread of diseases.

Soil Conditions

Potato can be produced on a wide range of soils, ranging from sandy loam, silt loam, loam and clay soil. Soil for potato should be friable, well aerated, fairly deep and well supplied with organic matter. Well- drained sandy loam and medium loam soils are most suitable for potato cultivation. Soil structure and texture has a marked effect on the quality of the tuber. Light soil is preferred, because they tend to promote more uniform soil temperatures and make harvesting of the crop easier. Alkaline or saline soil is not suitable for potato cultivation. They are well suited to acidic soils (pH 5.0 to 6.5) as acidic conditions tend to limit scab diseases.

Planting Time

1. **In Plains**

Early Crop: Third week of September to first week of October.

Main crop: First week of October to third week of October.

Late Crop: Third week of October to first week of November

II. In Hills

Potato is planted in hills from the third week of February to second week of April. In the southern hills near Ootacamund and in Nilgiris, planting is done three times in a year, i.e. in the month of February, April and September In the plateau regions of Maharashtra, Bihar Madhya Pradesh, potato is raised in rainy and winter seasons.. In the Mysore plateau, the summer and winter crop is planted in April-June and in October-December, respectively.

Seed Rate, Methods of Sowing and Spacing

The seed requirements for a hectare on the basis of seed size are given below:

Large size- 25-30 q/ha; Medium size- 15-20 q/ha; Small size- 10-15 q/ha; Out tubers- 8-12 q/h2:-' Potato is planted mainly by two methods:

1. Ridge and Furrow Method:

In this method, the ridges are prepared.The length of the ridges depends on slope of the plot. Too long ridges and furrows arc not supplied with irrigation water conveniently. The potato tubers are planted on is let into furrows.

2. Flat Bed Method

In this method, the whole plot is divided into beds of convenient length and width. The shallow furrows are opened and potato tubers are planted at recommended distance. The tubers are covered with the original soil of furrows. When the germination is completed and plants become 10 to 12 cm height, earthing

should be done. Suitable plant spacing in relation to potato seed grades are given below:

Diameter of tuber from longer axis	Planting distance (row x seed)
2.5-3.5 cm	50 x 20 cm or 60 x 15 cm
3.5-5.0 cm	60 x 25 cm
5.0-6.0 cm	60 x 40 cm

Nutritional requirements and their management:

Soils poor in organic matter content should be supplied with 250 to 500 q/ha of farmyard manure or compost during land preparation, preferably a fortnight before planting. Potato plant is a heavy feeder. When it is grown in medium type of soils, it needs 100 to 150 kg nitrogen, 80 to 100 kg phosphorous and 80 to 100 kg potassium per hectare. Two - third to three fourth quantity of nitrogen along with whole quantity of phosphorus and potassium is applied at the time of planting. Remaining one fourth to one third nitrogen is applied 30 to 35 days after planting i.e. at the time of first earthing up or when plants become 25 to 30 cm in height either in the form of top dressing or as a foliar feeding. Spraying of essential micronutrients such as boron, zinc, copper, iron, manganese, molybdenum etc. is done when crop is showing deficiency symptoms.

Intercultural Operations

In potato crop, both types of weeds are found i.e. broad-leaved weeds as well as narrow leaved weeds-The use of weedicides in

potato crop in general is not essential because earthing up operation destroy almost all weeds, if some how, weed plants are growing on ridges, they may be pulled out by hands. Pre-emergence application of nitrofen @ 1.0 kg a.i./ha or alachlor @.2.0 kg a.i./ha or post emergence application of propanil @ 1.0 kg a.i./ha may be used ill solution fom1 (800-1000 litre/ha). Care should be taken while spraying of post- emergence herbicides that they should not come in the contact to potato plants. Proper development of tubers depends upon aeration, moisture availability and proper soil temperature. Therefore, proper earthing up is necessary. Earthing should be done when the plants are 15 to 22 cm ill height. Generally earthing is done at the time of top dressing of nitrogenous fertilizers. The ridges should be high enough to cover up tubers. If necessary, a second earthing may be done after two -week of the first one. A mould board plough or a ridger may be used for earthing up in large area.

Use of Plant Growth Regulators

Soaking of potato seed tuber in CCC at 500 mg/l (Schedule and Pandita, 1986), sodium ascorbate at 100 mg/l (Murti et al.. 1975) cytozyme at 5 per cent (Pandita and Hooda, 1979), Singh and Kaur, 1981) or foliar sprays with ethephon at 400 mg/l (Murti and Banerjee, 1978, Pandita and Hooda, 1979 a, Sekhon and Singh, 1985), CCC at 25 mg/l or garlic acid at 10-100 mg/l(Kumar and Agarwal, 1978) increased tuber yield. Sidda Reddy (1988) also obtained higher tuber yield with foliar sprays of mixtallol at 1 or 2 mg/l.

Water Management

Before coming to the planting operation. it should be kept in mind that the sufficient soil moisture is available for satisfactory sprouting. If not then light pre-irrigation or just after planting may be given. The rate of water use is low till 30-35 days after planting; it means that the first irrigation is essentially done within 30-35 days after planting. However, when soil moisture seems insufficient for sprouting, intervals of first irrigation should be reduced. Further, irrigation is done as and when crop needs. As regards method of irrigation in potato, the furrow method is commonly followed.

Harvesting, Yield and Storage

Harvested potatoes are heaped under shade for a couple of days, so that their skin becomes hard and soil adhering with them is also separated out. Under good crop management, 350-450 quintals of marketable potatoes of good quality can be produced from one hectare land. The sorting operation is the most important, in that all cut tubers, bruised, injured by insects-pest and disease are removed. Sorted healthy tubers are graded in to different grades based on diameter of the tubers reduce the prices in the market. Therefore, such tubers should be sorted and marked separately. Over sized tubers are great in demand for chips making. Very small sized tubers are also not remaining unsold. These tubers are purchased by poor people for making vegetable by partially Cushing them before cooking. However, both the over sized and under sized are quite unsuitable for seed purposes. Potatoes can be stored in the cold storage at the temperatures of 4 to 7oC and relative humidity.

(plant protection)

Diseases and their prevention

1) Blight:- There are two types of blight.

A) Early blight:- This disease is caused by **Alternaria solani** fungus.

B**) Late blight:-** This disease is caused by **Phytopthora infestance** fungus.

Control:- For the prevention of blight diseases, resistance varieties should be grown.For the prevention of both types of blight spraying three to five of 0.5% solution of Dithane M-45 or Dithane Z-78.

2) Virus disease

A) Leaf mosaic virus :- The disease is spread by Aphid. The plant stops growing.

Control:- To prevent this, adopt appropriate crop cycle.The diseased plant should be uprooted and destroyed. Only certified seeds should be sown.

B) Mosaic:- This is also a disease caused by the virus. Due to this disease, the leaves become smaller.

Control:- For its prevention also, certified seeds should be sown. Patient plants should be removed from the fields. These disease are spread by Aphid. To save the crop from Aphid, 800 liters solution of metasystox (30EC) at 0.01%should be sprayed per hectare.

3) Bacterial brown rot:- This disease is caused by pseudomonas solanacearum. This disease is a land borne disease.

Control:- By adopting proper crop cycle, we can save our crop from this disease.

Insect and their control

1) Cut worm:- It is an underground insect. Its caterpillar is green in colour. It eats the leaf and stem of the plant.

Control:- Drenching of ridges with the solution of Chlorpyriphos 20 EC at the rate of 2.5 l/litre of water when 2 % damage occurs.

- Use of Phorate 10 per cent granules at the rate of 10 kg per hectare or Carbafuran 3 per cent granules at the rate of 30 kg per hectare at the time of sowing has also been found very effective.

2) potato tuber moth:- It damages the standing crop of potatoes, along with it reaches the stock and also damages here. Its moths lay eggs in potato eyes and in 15-20 days, the trunk are released.

Control:- Before storage, potatoes should be dipped in 0.25% Eritan solution and dried in shade and sown in the following year. 600-700 litres per hectare of DDT(5%) solution should be sprinkled with a difference of about 15 to 20 days per hectare.

3) Aphid:- Aphid causes great damage to potato crop. They suck the juice of the leaves, causing the leaves to turn yellow.
Control:- 1000 liter solution of metasystox (3.5 Ec) 0.05% can also be sprayed per hectare for its control.

(2)

(Crop-Mentha)

English name: Mint
Family: *Lamiaceae; labiatae*
Indian name: Pudina (Tamil), Putiha (Sanskrit), Pudina (Hindi & Kanada)
Species and Varieties :

Mentha arvensis (Japanese mint)
M.piperita L. (Peppermint)
M.Spicata L. (Spearmint)
M.Citrata Ehrh. (Bergamot mint)
Himalaya, Kalka, Shivalik, Kosi, Gomati, EC-41911, Kulkrail, Kiran, MSS-1, MSS-5 Punjab spearmint-1

Distribution: India, Brazil,Paraguay,USA
Origin: Mediterranean regions
Uses: Cosmetics, Culinary purposes, Flavoring, Perfumery

Mints are a group of perennial herbaceous plants, belonging to the family *Lamiaceae:Labiatae*, which yield essential oil on distillation. The various species of mints which are commercially cultivated in different parts of the world are:Japanese mint or corn mint or field mint (*Mentha arvensis subsp haplocalyx* Briquet var. *Piperscens* Holmes var. *Javanica*), peppermint (*M.Piperita L.)* spearmint or garden mint or lamb mint (*M.spicata L.*) and bergamot mint or orange mint (*M.citrata Ehrh*.)

Distribution

Mint is believed to have originated in the Mediterranean basin and, from there, spread to the rest of the world by both natural and artificial means. Among the mints, Japanese mint is cultivated on a large scale in Brazil, Paraguay, China, Argentina, Japan, Thailand, Angola and India. Peppermint is grown in the USA, Morocco, Argentina, Australia, France, USSR, Bulgaria, Czechoslovakia, Hungary, Italy, Switzerland and on a small scale in many Europe countries. USA is the major producer of peppermint and

spearmint.
The total area under mint cultivation, which is mostly confined to Uttar Pradesh and the Punjab is around 10,000 ha.

Varieties

***A)* Japanese mint**
Himalaya (MAS0-1): It is a selection released by the CIMAP Lucknow which contains 0.8 to 1.0% oil (FWB) with 81% methol content and a low congealing point.
Kalka (Hyb-77); It is a tall, vigorous variety evolved by the CIMAP Lucknow.
Shivalik: It was introduced from China and released by the CIMAP, Lucknow.
Ec-41911: This is a progeny selection of an interspecific cross between *M.arvensis x M.piperita*.

B) Peppermint
Kukrail: This is a high yielding variety developed and released by the CIMAP Lucknow.

C) Spearmint
MSS-1: This is a selection from the spearmint cultivars inteoduced from USA. This variety was released by the CIMAP, Lucknow.
MESS-5: It is a selection from MSS-1 made at the CIMAP,Lucknow.
Punjab spearmint-1: This variety is a clonal selection made at the CIMAP, Lucknow .
Arka and Neera are the recently released variaties from CIMAP, Lucknow.

Chemical Composition and Uses
Japanese mint (M.arvensis)
Japanese mint is a primary source of menthol. The fresh leaves contain .4-6.0% oil. The main constituents of the oil are menthol (65-75%), menthone (7-10%) and menthyl acetate (12-15%) and terpenes (pipene, limonene and comphene).
Peppermint (M.piperita)
The fresh herb contains essential oils ranging from 0.4 to 0.6%. The constituents of

peppermint oil are almost similar to Japanese mint oil. However, the menthol content is lower in peppermint oil and varies between 35-50%. The other constituents are menthyl acetate (14-15%), menthone (925%) menthoufuran and terpenes like pinene and limonene.

Bergamot mint (M.citrate)

Linalool and linalyl acetate are the main constituents of Bergamot mint oil. The oil is used directly in perfumes. Cosmetic preparations like scents, soaps, after-shave lotions and colognes also contain this oil.

Spearmint (M.spicata)

The principal constituent of spearmint oil is carvone (57.71%) and the other minor constituents are phellandrene, limonene,L-pinene and cinelole. The oil is used mostly as a flavouring in toothpastes and as food flavouring in pickles and spices, chewing gum and confectionery, soaps and sauces.

Seasons

In the plains, planting is done during the winter months, whereas in temperate climates, planting is done in autumn or spring from the last week of December to the first week of March or from the first week of January to the third week of February. Late planting always gives poor yields.

Soil

Medium to fertile deep soil, rich in humus is ideal for the cultivation of mint. The soil should have a good water-holding capacity but water-logging should be avoided. A pH range of 6-7.5 is best.

Climate

Japanese mint can be grown in all tropical and subtropical areas under irrigation. However, it does not tolerate damp winters which cause root-rot. A temperature of 20-25ºC promotes vegetative growth, but the essential oil and menthol are reported to increase at a higher temperature of 30ºC under Indian conditions. Peppermint and spearmint cannot be grown profitably in tropical and sun tropical areas, especially those areas with very high summer temperatures (41ºC) and the ideal yield is obtained only in

humid and temperate conditions like in Kashmir and the hills of Uttar Pradesh and Himachal Pradesh. Open, sunny situations without excessive rains during the growing period are congenial for the good growth and development of the oil.
Bergamot mint can be grown both in temperate as well as subtropical area. However, the yield is higher in temperate climates.

Land Preparation

Mints require thoroughly ploughed, harrowed, fine soil. All the stubble of weeds should be removed before the crop is planted. Manuring may be done at the time of land preparation by adding FYM @ 25 to 30 t/ha. Green manuring may also be done before the mint is planted. Sun-hemp (*Crotalaria juncea* L.) is an ideal green manure crop. Mints are planted on flat land or ridges. Hence, flat beds of convenient sizes or ridges are made according to the spacing recommended.

Cultivation

Propagation

Mints are propagated through the creeping stolons or suckers. In the case of peppermint and bergamot mint, even runners are planted. Stolen are obtained from the previous year's planting. A hectare of well-established mint, on an average, provides enough planting material for ten hectares. About 400 kg stolons are required for planting one hectare of land. The best time for obtaining stolons is during the months of December and January.

Planting

The stolons are cut into small pieces (7-10 cm) and planted in shallow furrows about 7-10 cm deep with a row-to-row distance of 45-60 cm, manually or mechanically. While planting on ridges, the stolons are planted half-way down on the inner sides of the ridges. The plot is irrigated immediately after planting.

Fertilizer Application

Mint responds very well to a heavy application of nitrogenous fertilizers. The increase in herbage by the application of phosphorus is not as remarkable as in case of nitrogen. Generally, nitrogenous fertilizers @ 80-120 kg P and K at 50 kg P2O5 and 40 kg

K2O/ha is required for a good crop of mint. However, in M.arvensia an increase of up to 160 kg N/ha and, in M.piperate, 125 kg N/ha has given increased fresh herbage and essential oil-yield. An amount of 100-120 kg N/ha is recommended for producing the optimum herb and oil-yield in *M.citrata* under Pantnagar conditions. A split application of 75 kg N/ha in combination with P at 60 kg P2O5/ ha is recommended under Kodaikanal conditions. Potassium application has no significant effect on herb and oil-yield.
In *M.spicata*, the maximum herb-yield is obtained with the application of 100-120 kg N/ha. Nitrogen may be applied in three split doses at 1, ½-2 and 3 months after planting and the third dose after the first harvest of the crop.
Boron deficiency reduces both the yield of green herb and the essential oil in peppermint. Increased yields of herb, menthol content and essential oil content in peppermint have been obtained by using a combination of boron and zinc fertilizers, Visual symptoms have been documented for some cultivars of Japanese mint towards Fe and Zn deficiencies. With respect to Zn, the crop response was maximum at 20 kg/ha if Zn applied at planting. Similarly, experiments conducted at the CIMAP, Lucknow, have shown that the application of 20 kg/ha of sulphur will increase the herb and oil-yield in *M.spicata.* Among the different sources of S, calcium sulphate was best followed by ammonium sulphate and elemental sulphur.

Irrigation

The water requirement of mint is very high. Depending upon the soil and climatic conditions, the crop is irrigated 6-9 times before the first monsoon. The crop requires three irrigations after the monsoons during September, October and November. Sometimes another irrigation is required during winter, if the plant is dormant and there are no winter rains to encourage proper growth of the under ground stems. Experiments conducted at Pantnagar have revealed that fifteen irrigation are required to get the maximum herb and oil-yield in Japanese mint. When mints are grown in temkperte climates, only 3-4 irrigation during the period from July to October are required.

Inter-culture and Weed Control

Uninterrupted weed growth causes about 60% reduction in herb and oil-yields. Hence, mints require weeding and hoeing at regular intervals in the early stages of crop growth. One hand-weeding is required after the first harvest. Sinbar is the only herbicide which controls a large number of weeds effectively, when applied as a post-emergence spray

@ 1 kg/ha. However, combining organic mulch with a combination of 0.5 kg/ha of Oxyfluorfen herbicide and weeding or application of Pendimethion herbicide at 1 kg/ha and weeding are found to give excellent weed control throughout the crop growth. Dalapon (4 kg/ha), or Gramaxone (2.5 1/ha) as post-emergent spray; Diuron (2 kg a.i/ha) or Terbacil treatment (2 kg a.i/ha) as preemergent treatment are also recommended for chemical weed control in mints.

In low temperature areas, the plants become dormant in November. In order to give a perennial crop (of 3 years only) in peppermint, recultivation is done either in autumn (November-December) or in spring (March-April). When peppermint is grown as a perennial crop, the first year crop is called ‘Row mint’, while the second and third year crop is called ‘Meadow mint’. This practice is not followed in other mints which are to be planted every year

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Crop Rotation

Crop rotations help to maintain a reasonable control on weed growth, preserve the fertility of the soil and to obtain higher returns from the land. The following crop rotations are in practice in Uttar Pradesh (a) Mint-maize-potato) (b) Mint-early paddy and potato and (c) Mint-late paddy and sweet pea. Whereas, in Punjab, the farmers practice mint-maize and rape seed/mustard and mint-maize and potato or mint and paddy rotation. The recommendation for the Terai region of Uttar Pradesh is a 2-year rotation of mint-summer fallowing or millet (fodder) followed by mint on poor fertility lands and mint-wheat-paddy and mint on medium fertile lands.

Harvesting

Japanese mint is generally harvested after 100-120 days of planting, when the lower leaves start turning yellow. If the harvesting is delayed the leaves start falling, resulting in loss of oil. Further, harvesting should be done in bright sunny weather. Harvesting consists of cutting the green herb by means of a sickle 2-3 cm above the ground. A second harvest is obtained about 80 days after the first harvest and the third one after about 80 days from the second harvest. Whereas, in peppermint, spearmint and bergamot mints which are grown in temperate climates, the first crop is ready by the end of June and the second in September or October.

Yield

A good crop of Japanese mint can give as high a yield as 48 t/ha of fresh herb. However, the average yield of mints from three cuttings is 20-25 t/ha. The fresh herb contains 0.4% oil.

Distillation of Oil

Mint oil is obtained by distilling either the fresh or the dry herb. The distillation is done both in primitive and modern stills; in the former the principle of water and steam-distillation is followed. While in the later steam generated in a separate boiler is employed. The stems are removed from the dried material prior to distillation, because they constitute 30 to 50% of the material and contain only traces of the oil.
The average yield of oil is 50-70 kg/ha. Although bergamot mint as well as Japanse mint give an average yield of 70-100 kg/ha, the yield of peppermint oil is lower with an average of 50 kg/ha.

Storage of Oil

Mint oil is a light and golden-coloured, motile liquid and it should be completely free from moisture before storage. It is stored in large steel, galvanized steel or aluminium containers, filled up to the brim to protect against any air remaining inside and placed in a cool storage godown, away from light and humidity.