Mint for Oil - Horticulture

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Crop Description

Mints are a group of perennial herbs that are commercially important sources of essential oils obtained by distillation of their hay. The discussion in this section refers to the production of essential oils. They are also commonly grown as a leaf herb; see the leafy vegetable section for common production practices for that product. The most common cultivated types are peppermint and spearmint.

Peppermint (*Mentha x piperita*): All peppermints are a hybrid of two other species, watermint (*M. aquatica*) and native spearmint (*M. spicata*). The varieties include Black Mitcham, Murray Mitcham, Robert's Mitcham, and Todd's Mitcham. The latter three varieties are more resistant to verticillium wilt.

Spearmint: Scotch Spearmint (*M. cardiaca*) and Native Spearmint (*M. spicata*). These two species of spearmints have distinctly different oils.

Because verticillium wilt disease is an important problem even with the more resistant varieties, growers should always use disease-free planting stock. Certified and disease-free stocks are available.

Planting and Spacing

Mints are grown from 3- to 4-inch long dormant runners dug from existing fields in the late fall or spring. They spend their first year as a row crop before spreading through runners. The following years are spent as a solid stand or meadow crop. Careful fall plowing of established stands is important for both winter protection and for reducing the incidence of mint rust and other foliar diseases. "Squirelly" mint, which occurs primarily on peppermint, is caused by the mint bud mite, *Tarsonemus pipermenthae.* Although mints are perennials, older stands may show serious build-ups of disease, insect, and weed problems and should be rotated out every 3 to 4 years.

Fertilizing

pH: Maintain a soil pH of 5.5 to 6.5.

New plantings: Before planting new stolons, apply 40 pounds N per acre, 0 to 100 pounds P_2O_5 per acre, and 0 to 400 pounds K_2O per acre based on soil test results and recommendations from your state. Broadcast the fertilizer and plow it under when preparing the land for the planting furrows.

Topdress with 40 pounds N per acre on muck soils, or 80 pounds N per acre for mineral soils in early June.

Established plantings: Each year before emergence, broadcast or drill in 40 to 60 pounds N per acre, 0 to 50 pounds P_2O_5 per acre and 0 to 150 pounds K_2O per acre if a soil test recommends it.

Topdress with 60 to 90 pounds N per acre after canopy closure. The total amount of N from fertilizer should be 120 to 150 pounds N per acre.

Irrigation significantly increases oil yields on both muck and mineral soils, even in seasons with normal rainfall.

Harvesting

For oil production, maximum yield and quality is reached when 10% of peppermint is in full bloom, or 100% of spearmint is in full bloom. Cut, windrow, and allow to partially dry for 24 to 36 hours before collecting for distillation. The machines for this are similar to hay machines, but the collection into distillation tubs requires a specialized procedure and equipment.

Indiana Mint

Indiana grows the most mint in the Midwest and has a dedicated resource website, titled Indiana Mint Oil Production, within the Purdue web system.

Mint for Oil - Horticulture

Mint for Oil - Diseases

Leaf Spot of Mint - Septoria Fungus

Pesticide

chlorothalonil products (chlorothalonil) | *Indiana and Michigan only.* Several formulations are labeled at various rates (Bravo, Echo, Equus, Initiate). Use 38.5% (Zn) formulations at 2 pt. per acre. Use 54% (720) formulations at 1.38 pt. per acre. Use 82.5% (WDG) formulations at 1.2 lb. per acre. Use 90% (DF) formulations at 1.1 lb. per acre. REI: 12-hour. PHI: 80-day. FRAC M05.

Rust of Multiple Crops - Puccinia Fungus

Pesticide

azoxystrobin products (azoxystrobin) | Several formulations are labeled at various rates (Acadia LFC, AZteroid FC 3.3, Heritage, Quadris). Use 3.3 lb. a.i. per gallon formulations at 3.9-9.7 fl. oz. per acre. Use 2 lb. a.i. per gallon formulations at 6.0-15.5 fl. oz. per acre. Use 1.65 lb. a.i. per gallon formulations at 7.6-19.5 fl. oz. per acre. Use 0.5 lb. a.i. per gallon formulations (Heritage) on greenhouse transplants only at 0.08-0.18 oz. per 1,000 sq. ft. REI: 4-hour. PHI: 0-day for fresh; 7-day for processed. FRAC 11.

chlorothalonil products (chlorothalonil) | *Indiana and Michigan only.* Several formulations are labeled at various rates (Bravo, Echo, Equus, Initiate). Use 38.5% (Zn) formulations at 2 pt. per acre. Use 54% (720) formulations at 1.38 pt. per acre. Use 82.5% (WDG) formulations at 1.2 lb. per acre. Use 90% (DF) formulations at 1.1 lb. per acre. REI: 12-hour. PHI: 80-day. FRAC M05.

Headline (pyraclostrobin) | 9-12 fl. oz. per acre. Additional formulations of Headline may be labeled. REI: 12-hour. PHI: 14-day. FRAC 11.

propiconazole products (propiconazole) | 4 fl. oz. per acre. Propimax EC and Tilt are labeled. REI: 12-hour. PHI: 90-day. FRAC 03.

Rally 40WSP (myclobutanil) | 4-5 fl. oz. per acre. REI: 24-hour. PHI: 30-day. FRAC 03.

Wilt of Multiple Crops - Verticillium Fungus

Non-Pesticide

Rotate plantings after no more than 3 or 4 years. Use wilt resistant varieties of peppermint. Native spearmint is resistant.

Mint for Oil - Insects

Caterpillars

The primary caterpillar pests of mint are loopers, cutworms, and the mint root borer.

Non-Pesticide

The soil-dwelling mint root borer caterpillar can be treated with the commercially-available parasitic nematode, *Steinernema carpocapsae*. Mix the nematodes with water and apply at a rate that deposits 1 - 1.5 billion nematodes per acre.

Pesticide

Avaunt (indoxacarb) | 3.5 oz. per acre. For cutworms, and loopers. REI: 12-hour. PHI: 7-day. IRAC 22.

Bt (Bacillus thuringiensis) products for caterpillars (Bacillus thuringiensis aizawai strain ABTS-1857, Bacillus thuringiensis aizawai strain GC-91, Bacillus thuringiensis kurstaki strain ABTS-351, Bacillus thuringiensis kurstaki strain EVB-113-19, Bacillus thuringiensis kurstaki strain SA-11) | For armyworms, cutworms, and loopers. Various Bt products (Agree, Biobit, Dipel, Javelin, etc.) are available for control of young caterpillars however, different Bt products can vary in the effectiveness against caterpillars. REI: 4-hour. PHI: 0-day. IRAC 11A.

Coragen (chlorantraniliprole) | 3.5-7.0 fl. oz. per acre. For armyworms, cutworms, loopers, and mint root borers. REI: 4-hour. PHI: 3-day. IRAC 28.

Entrust SC (spinosad) | For armyworms, cutworms, and loopers. Use 2SC formulations at 4.0-10.0 fl. oz. per acre. Use 80WP formulations at 1.25-3.0 oz. per acre. REI: 4-hour. PHI: 7-day. IRAC 05. *OMRI-listed.*

Intrepid 2F (methoxyfenozide) | 10-16 fl. oz. per acre. For armyworms, cutworms, and loopers. REI: 4-hour. PHI: 14-day. IRAC 18.

Lannate LV (methomyl) | 3 pts. per acre. For cutworms, and loopers. REI: 48-hour. PHI: 14-day. IRAC 01A. *RUP.*

Orthene 97 (acephate) | 1 lb. per acre. For cutworms, and loopers. REI: 24-hour. PHI: 14-day. IRAC 01B.

Radiant 1SC (spinetoram) | 4-12 fl. oz. per acre. For armyworms, cutworms, and loopers. REI: 4-hour. PHI: 7-day. IRAC 05.

Flea Beetles

Pesticide

Actara (thiamethoxam) | 1.5-3.0 oz. per acre. See pollinator precautions. REI: 12-hour. PHI: 7-day. IRAC 04A.

Lannate LV (methomyl) | 2.25-3 pts. per acre. For best results, apply immediately after harvest on stubble. REI: 48-hour. PHI: 14-day. IRAC 01A. *RUP.*

Malathion 5EC (malathion) | Use 5EC formulations at 1.5 pts. per acre. Use 57EC formulations at 1.0-1.5 pts. per acre. For best results, apply immediately after harvest on stubble. REI: 12-hour. PHI: 7-day. IRAC 01B.

Mites

Squirrelly mint, which occurs primarily on peppermint, is caused by the mint bud mite, *Tarsonemus pipermenthae*.

Pesticide

Acramite 50WS (bifenazate) | 0.75-1.5 lbs. per acre. REI: 12-hour. PHI: 7-day. IRAC UN.

Agri-Mek SC (abamectin) | Use 0.7SC formulations at 1.75-2.5 fl. oz. per acre. Use 0.15EC formulations at 8-12 fl. oz. per acre. REI: 12-hour. PHI: 28-day. IRAC 06. *RUP.*

Dicofol 4E (dicofol) | 1.75-2.5 pts. per acre. REI: 12-hour. PHI: 30-day. IRAC UN.

Portal (fenpyroximate) | 1-2 pts. per acre. REI: 12-hour. PHI: 1-day. IRAC 21A.

Zeal (etoxazole) | 2-4 oz. per acre. REI: 12-hour. PHI: 7-day. IRAC 10B.

Mint for Oil - Weeds

All Weeds

Before establishing a mint planting, reduce perennial weeds in the area to be planted with systemic broad-spectrum herbicides and/or cultivation. For full-season weed control consider combinations of dormant, in-season, and post-harvest herbicide applications.

For specific weeds controlled by each herbicide, check the Relative Effectiveness of Herbicides for Vegetable Crops table.

Rates provided in the recommendations below are given for overall coverage. For a banded treatment, reduce amounts according to the portion of acre treated.

Non-Pesticide

Because mint is grown as a short-lived perennial crop, weed management in preceding crops is important to reduce the amount of weed seeds in the soil, and good weed control in the planting year is especially important. Between-row cultivation can be used in the first year before stolons and rhizomes grow into fill in this space. Late winter or early spring cultivation can be used to control winter annual weeds.

Pesticide

Aim EC (carfentrazone) POST | 0.5 to 1.92 fl. oz. per acre Apply before crop emergence to emerged weeds less up to 4 in. tall. Add 1 qt. COC (1% v/v) or 0.5 pt. NIS per 25 gal. of spray solution (0.25% v/v). REI: 12-hour. PHI: 5-day HRAC 14.

Anthem Flex (carfentrazone, pyroxasulfone) POST PRE | 3.5 fl oz. per acre. Make a single application over-the-top of dormant peppermint or spearmint. Add 1 qt. COC (1% v/v) or 0.5 pt. NIS per 25 gal. of spray solution (0.25% v/v). When hard water is used, add spray grade UAN or AMS. Do not use on coarse soil or soil classified as sand. Do not apply to soil with less than 1% organic matter. Do not apply to newly planted mint. REI: 12-hour. PHI: 5-day. HRAC 14, HRAC 15.

Assure II (quizalofop) POST | 8-12 oz. per acre. Add 1 qt. COC or 0.5 pt. NIS per 25 gal. of spray solution. Apply to actively growing grass. Do not exceed 2 applications or 24 fl. oz. per acre per season. Applications must be greater than 7 days apart. REI: 12-hour. PHI: 30-day. HRAC 01.

Basagran (bentazon) POST | Use 4L formulations at 1-2 pts. per acre and 5L formulations at 1.2-1.6 pt per acre. Apply after mint and weeds have emerged. To control yellow nutsedge and Canada thistle, repeat application 7-10 days later. Crop oil will enhance activity. Do not exceed 4 pts. per acre per season. REI: 48-hour. PHI: 20-day. HRAC 06.

Chateau SW (flumioxazin) POST PRE | 2-4 oz. per acre of Chateau SW or 2-4 fl. oz. per acre of Chateau EZ. Apply to established, dormant mint from November 25 to March 1. Do not apply to frozen or snow covered ground. Do not exceed 4 oz. per acre in a single application or more than 8 oz. per acre in a single growing season. Do not make a sequential application of Chateau within 60 days of first application. Applying to nondormant mint may result in unacceptable injury. For improved postemergence control, tank-mix with paraquat and add NIS at 0.5 pt. per 25 gal. of solution (0.25% v/v). Adding a nitrogen source will increase activity. REI: 12-hour. PHI: 80-day. HRAC 14.

clethodim products (clethodim) POST | Use 2EC formulations at 6-16 fl. oz. per acre with 1 qt. COC per 25 gals. of spray solution (1% v/v). Do not exceed 32 fl. oz. per acre per season. Use Select Max at 9-16 fl. oz. per acre to control annual grasses and 12-32 fl. oz. per acre to control perennial grasses. Add 1 qt. COC (1% v/v) or 0.5 pt. NIS per 25 gals. of spray solution (0.25% v/v). Do not exceed 64 fl. oz. per acre per season. Spray on actively growing grass. Wait at least 14 days between applications. REI: 24-hour. PHI: 21-day. HRAC 01.

clopyralid products (clopyralid) POST | 0.33-1.0 pt. per acre. Apply Spur or Stinger (40.9% formulations only) with 4 fl. oz. of NIS per 25 gals. of spray solution. Apply up to 0.5 pt.

in spring or up to 1 pt. in fall. Controls mainly composites and nightshade. To control Canada thistle in spring, apply before bud stage. Do not use mint straw, hay, or spent hay for compost or mulch and do not dispose of on land to be rotated to broadleaf crops due to herbicide remaining in mint hay or straw that will injure broadleaf plants. Do not exceed 1 pt. per acre per growing season. REI: 12-hour. PHI: 45-day. HRAC 04.

Command 3ME (clomazone) PRE | 1.3 pts. per acre. Apply in spring before mint starts to grow. Do not apply to emerged mint. Do not exceed 1 application per season. Some whitening of tissue may occur as mint emerges. REI: 12-hour. PHI: 84-day. HRAC 13.

Devrinol DF-XT (napropamide) PRE | 8 lb. per acre. *New plantings:* Apply soon after planting. *Established plantings:* Must be established for at least one growing season. REI: 24-hour. HRAC NC.

glyphosate products (glyphosate) POST | Apply as a spot treatment in a 1-2% solution to actively growing weeds. The sprayed mint crop will be killed. Not all glyphosate formulations are labeled for mint. Apply as a spot treatment to no more than 10% of any acreage but can reapply to the same area at 30-day intervals. Avoid any drift to nontarget crops. REI: 4-hour to 12-hour. PHI: 7-day. HRAC 9.

GoalTender (oxyfluorfen) POST PRE | *Indiana and Michigan only.* 2-3 qt. per acre **Goal 2XL** or 1 pt. per acre **GoalTender**. Use 20-40 gals. of water per acre. Add 0.5 pt. NIS per 25 gal. of solution if emerged weeds are present. Apply to dormant spearmint and peppermint on muck soil (greater than 20% organic matter) before weeds are 4 in. tall. Application to emerged mint will result in severe injury. Not for use on mineral or black sand soils. REI: 24 to 48-hour. HRAC 14.

Moxy 2E (bromoxynil) POST | 1.0-1.5 pts. per acre. Apply in at least 10 gals. water per acre. Apply before weeds have more than 4 leaves, and only on established mint that has been harvested at least one year prior to application. Do not apply to mint growing under stressful conditions, or when air temperatures are, or are expected to be, more than 70 F within 5 days of application. REI: 24-hour. PHI: 70-day. HRAC 06.

paraquat products (paraquat) POST | 1.3-2 pt. per acre of 3 lb. per gal. formulation or 2-3 pt per acre of 2 lb. per gal. formulation. Add 1 qt. COC (1% v/v) or 0.5 pt. NIS (0.25% v/v) per 25 gal. Apply to dormant mint when weeds are less than 6 in. tall. Do not make more than 2 applications per year or apply more than 2 pt. per dormant season. Certified applicators must successfully complete an EPA-approved training program before mixing, loading, and/or applying paraquat. REI: 12 to 24-hour. HRAC 22. *RUP.*

pendimethalin products (pendimethalin) PRE | 1.5-4.0 pts. per acre. *Established mint only*. Apply 3.8 formulations to dormant mint before mint and weeds start to grow. Use low rate on coarse soils. REI: 24-hour. PHI: 90-day. HRAC 03.

Poast (sethoxydim) POST | 1.0-2.5 pts. per acre. Add 1 qt. COC per 25 gal. of spray solution (1% v/v). Spray on actively growing grass. Do not exceed 5 pt. per acre per season. REI: 12-hour. PHI: 20-day. HRAC 01.

Sinbar WDG (terbacil) POST PRE | As a preemergence application for weeds, apply 1-2 lb. per acre in the spring just after the last cultivation and before mint starts growing. As a postemergence application for weeds, apply 1.0-1.5 lb. per acre in the spring to broadleaf weeds less than 2 inches tall or grasses less than 1 inch tall and before mint starts growing. For postemergence application, add 1 qt. COC (1% v/v) or 0.5 pt. NIS (0.25% v/v) to 25 gal. of solution. Do not apply more than 2 lb. per acre per season. Discontinue use 1 year before rotating to other crops. REI: 12-hour. PHI: 60-day. HRAC 05.

Spartan 4F (sulfentrazone) PRE | New plantings: 3.3-9.0 fl. oz. per acre. Established plantings: 4.5-12.0 fl. oz. per acre. Renovation: 4 fl. oz. per acre. *New plantings:* Apply after planting before weeds and mint emerge. *Established plantings:* Apply to established mint when it is dormant, in the fall after postharvest cultivation, and/or in the spring after cultivation. *At renovation* ***(Indiana only with 24c label)****:* After cutting and removing mint from the field, apply 4 fl. oz. per acre. Use lower rates on coarse soil with low organic matter. Rainfall or irrigation is required to move herbicide into the soil. Application may injure crop as mint emerges. Application to emerged mint will result in severe injury. Do not exceed 12 fl. oz. per 12-month period. Do not apply to mint grown on sands with less than 1% organic matter. REI: 12-hour. PHI: 92-day for dormant and new planting applicatons, 55-day for renovation applications. HRAC 14.

Thistrol (MCPB) POST | 1-2 pts. per acre. Apply in spring after mint emerges to suppress broadleaf weeds, or apply in fall to control winter annuals. May injure mint. Oil yields may be reduced if mint is more than 6 inches tall at the time of application. Bindweed suppression is best with spring application when weeds are 6-8 inches long. REI: 24-hour. PHI: 40-day. HRAC 04.

Tough 5EC (pyridate) POST | 24 fl. oz. per acre. Apply before broadleaf weeds reach the 4-leaf stage. Add 1 qt. COC (1% v/v) or 0.5 pt. NIS per 25 gals. of spray solution (0.25% v/v). Do not exceed 24 fl. oz. per acre in a single application or 48 fl. oz. per acre per year. This product does not provide pre-emergence weed control. May be combined with a grass-selective herbicide. REI: 12-hour. PHI: 49-day. HRAC 06.

trifluralin products (trifluralin) PRE | Apply 1.0-1.5 pt. per acre of 4 lb. per gal. trifluralin to established, dormant or semi-dormant mint, late winter to spring or in the fall after

harvest prior to emergence of targeted weed species. Must be incorporated mechanically or by 0.5 in. rainfall or irrigation within 3 days of application. REI: 12-hour. HRAC 03.