

Legumes - Horticulture

Reviewed by Ben Phillips, Liz Maynard – Oct 2020

Crop Description

Fresh or Snap Bean (*Phaseolus vulgaris*): These are edible podded beans that are usually green (green beans) or yellow (wax beans), but they also come in red and purple podded varieties as well. They are harvested while pods and seeds are still tender. Older varieties (string beans) had a fibrous “string” the length of the pod that was removed during preparation for eating. Flat-podded Romano beans are also harvested while pods and seeds are tender. Within this category are “vining”, “pole”, or “runner” beans that need trellising, and “bush” beans that are short and sturdy.

Dry Bean (*Phaseolus vulgaris*): Dry beans refers to a wide variety of beans harvested after the seeds are mature and pods have dried down. Kidney, navy, black turtle, white, and pinto beans are examples. Within this category are “vining”, “pole”, or “runner” beans that need trellising, and “bush” beans that are short and sturdy.

Lima Bean (*Phaseolus lunatus*): Lima beans represent a different species than fresh beans and dry beans. They can be harvested when completely dry (like dry beans) or as “baby limas” before the seed has matured (similar to the southern pea described below). Some lima bean varieties will readily climb a trellis, but other varieties are more bush-like.

Fresh Pea (*Pisum sativum*): These peas are cool-season crops grown for their immature edible seeds or pods. Snow peas have flattened, tender, edible pods and seeds. Snap peas have edible pods and plump seeds. Shell peas have pods that are too tough to eat and the peas must be removed for eating. Some pea varieties will readily climb a trellis, but other varieties have a sprawling bush-like architecture.

Dry Pea (*Pisum sativum*): These peas are cool-season crops grown for their mature edible seeds, like dry beans. Dry pea varieties are more bush-like to facilitate machine harvest.

Southern Pea, Cowpea (*Vigna unguiculata*): These peas are heat-loving crops more commonly grown in southern states, though they can be grown in the north. They include black-eyed peas, cream peas and crowder peas. They are grown for their immature and dried shelled seeds, and are well-accepted in markets where customers are familiar with them. Southern peas have a sprawling bush-like architecture.

Planting and Spacing

Fresh or Snap Bean, Dry Bean, Lima Bean, Southern Pea: Rows 18 to 36 inches apart, 5 to 7 seeds per foot of row for bush types (70 to 100 pounds per acre), or 2 to 3 seeds per foot of row for vining types (35 to 50 pounds per acre). Larger inter-row spacing helps limit white mold development. These warm-season vegetables should be sown after soil temperatures average 60° F and frost danger is past. Sequential plantings of bush snap beans are possible. Vining types will readily climb a trellis of horticultural netting up to 8 feet tall without much training.

Fresh Pea and Dry Pea: Rows 32 to 36 inches apart, 6 to 8 seeds per foot of row for bush types (100 to 150 pounds per acre), or 3 to 4 seeds per foot of rows for vining types (50 to 75 pounds per acre). These cool-season vegetables should be sown in early spring for a spring crop or in mid to late summer for a fall crop. Plants deteriorate quickly in the heat of summer. Vining types will readily climb a trellis of horticultural netting up to 5 feet tall without much training.

Fertilizing

pH: Maintain a soil pH of 6.0 to 6.5.

Before planting, apply 20 to 40 pounds N per acre for peas and 30 to 60 pounds N per acre for beans, 0 to 100 pounds P₂O₅ per acre, and 0 to 100 pounds K₂O per acre based on soil test results and recommendations from your state. Or apply some or all of that amount at planting in bands at least 2 inches below and 2 inches to the side of the row, except the rate of K₂O should not exceed 40 pounds per acre when applied this way because peas and beans are sensitive to injury from fertilizer salts. Reduce the preplant fertilizer by the amount applied in bands at planting.

Beans are prone to zinc and manganese deficiency when pH is over 6.5. Include up to 1 pound of zinc per acre and 2 pounds of manganese per acre in the banded planting time fertilizer. If banding is not possible zinc may be broadcast up to 10 pounds of zinc per acre. Broadcasting manganese is not recommended. Foliar sprays of 0.5 pounds zinc per acre or 1 to 2 pounds manganese per acre can be used if needed.

Sidedressing is not needed for legume crops. Reduce the amount of fertilizer N applied by the value of N credits from green manures, legume crops grown in the previous year, compost and animal manures, and soils with more than 3 percent organic matter. The total amount of N from fertilizer (including starter) and other credits should be 40 to 60 pounds per acre.

Harvesting

Fresh or Snap Beans and Fresh Peas: Harvests can take place every few days once plants start producing pods that are of the desirable size. More picking generates more flowers and more pods later. Bush-type beans are commonly machine harvested and sorted with a once-over pass. Time from seeding to harvest ranges from 50 to 60 days for beans, or 60-70 days for peas.

Dry Peas and Dry Beans: Harvests can take place as once-over harvests when pods are dry. Machine harvests should take place before noon when plants are slightly damp to avoid pod shatter. Time from seeding to harvest ranges from 70 to 120 days for beans, or 80 to 100 days for peas.

Southern Peas and Lima Beans: Target harvests for fresh products when the seeds are succulent, and the pods are juicy. When the first beans are ready plants can be hand harvested for fresh product about once per week. A once-over harvest is used for dry seeds. Time from seeding to fresh harvest ranges from 60 to 70 days for southern peas, or 60 to 90 days for lima beans. For dried seeds, time from seeding to harvest can be over 100 days.

Legumes - Diseases

Reviewed by Dan Egel – Nov 2020

Recommended Controls

Anthracnose of Legumes - Colletotrichum Fungus

Non-Pesticide

Beans (Dry), Southern Peas/Cowpeas | Use disease-free seed. Rotate to non-host crops for 3 years. Varieties with partial resistance are available, depending on the race of the pathogen. Prompt destruction of the finished crop with tillage to rapidly breakdown tissue is an important method to prevent disease build-up.

Pesticide

Approach (2.08SC) (picoxystrobin) *Beans (Dry), Peas (Dry)* | 6-12 fl. oz. per acre. REI: 12-hour. PHI: 14-day. FRAC 11.

Aprovia Top (difenoconazole, benzovindiflupyr) *Beans (Dry), Peas (Dry)* | 10.5-11 fl. oz. per acre. A

spreader sticker is recommended. REI: 12-hour. PHI: 14-day. FRAC 3, FRAC 7.

azoxystrobin products (azoxystrobin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 2 lb. a.i. per gallon formulations (Quadris) at 6.0-15.5 fl. oz. per acre. Use 3.3 lb. per gallon formulations (Azteroid) at 3.9-9.7 fl. oz. per acre. REI: 4-hour. PHI: 0-day for fresh legumes, 14-day for dry legumes. FRAC 11.

chlorothalonil products (chlorothalonil) *Beans (Dry), Beans (Fresh), Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Several formulations of chlorothalonil (Bravo, Echo, Equus) are labeled at various rates. See label for directions. REI: 12-hour. PHI: 7-day for fresh legumes, 14-day for dry legumes. FRAC M5.

Fontelis (1.67SC) (penthioopyrad) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 14-30 fl. oz. per acre. Rates above 20 fl. oz. per acre are for fresh legumes only. REI: 12-hour. PHI: 0-day for fresh legumes, 21-day for dry legumes. FRAC 7.

Headline (SC) (2.08) (pyraclostrobin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 6-9 fl. oz. per acre. REI: 12-hour. PHI: 7-day for fresh. 21-days for dry. FRAC 11.

Priaxor (fluxapyroxad, pyraclostrobin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 4-8 fl. oz. per acre. REI: 12-hour. PHI: 7-day for fresh legumes, 21-day for dry legumes. FRAC 7, FRAC 11.

propiconazole products (propiconazole) *Beans (Dry), Beans (Fresh), Lima Beans, Southern Peas/Cowpeas* | 4 fl. oz. per acre. PropiMax EC and Tilt are labeled. REI: 12-hour. PHI: 7-day for fresh legumes. FRAC 3.

Quadris Opti (SC) (azoxystrobin, chlorothalonil) *Beans (Dry)* | 1.6-2.4 pts. per acre. REI: 12-hour. PHI: 14-day. FRAC 11, FRAC M5.

Quadris Top (SC) (azoxystrobin, difenoconazole) *Beans (Dry), Peas (Dry)* | 12-14 fl. oz. per acre. REI: 12-hour. PHI: 14-day. FRAC 11, FRAC 3.

Quilt (SE) (azoxystrobin, propiconazole) *Beans (Dry), Beans (Fresh), Southern Peas/Cowpeas* | 14 fl. oz. per acre. REI: 12-hour. PHI: 7-day for fresh legumes, 14-day for dry legumes. FRAC 11, FRAC 3.

Topsin 4.5FL (thiophanate-methyl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 4FL formulation or Cercobin at 20-40 fl. oz. per acre, or 70WSB formulation at 1-2 lb. per acre. REI: 24-hour to 3-day. PHI: 14-day for fresh legumes, 28-day for dry legumes. FRAC 1.

Vertisan (1.67EC) (penthioopyrad) *Beans (Dry), Southern Peas/Cowpeas* | 14-20 fl. oz. per acre. REI: 12-hour. PHI: 21-day. FRAC 7.

Common Bacterial Blight of Beans - *Xanthomonas* Bacteria

Non-Pesticide

Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | Plant western-grown, certified disease-free seed. Rotate to non-host crops for 2 years. Prompt destruction of the finished crop with tillage to rapidly breakdown tissue is an important method to prevent disease build-up.

Pesticide

copper products (copper hydroxide, copper octanoate, copper oxychloride, copper sulfate, copper diammonium diacetate complex, cuprous oxide) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* |

Legumes - Diseases

Several formulations of copper (Badge, Champ, Kocide) are labelled for use and may slow the spread of bacterial blights. See label for directions. REI: 4 to 48-hour. PHI: 0-day. FRAC M1.

Damping-Off Seed and Seedling Rots of Multiple Crops - Multiple Pathogens

Non-Pesticide

Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | Plant western-grown, certified disease-free seed. Avoid planting in prolonged wet conditions.

Pesticide

Ridomil Gold SL (4SC) (mefenoxam) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.5-1.0 pt. per acre. Apply at planting if Pythium is a significant problem. REI: 48-hour. FRAC 4.

Seed treatments (thiamethoxam, mefenoxam, fludioxonil, azoxystrobin, thiabendazole, spinosad, abamectin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Purchase seed commercially treated with a product such as Apron Maxx, Captan or Thiram. IRAC 4A, FRAC 4, FRAC 12, FRAC 11, FRAC 1, IRAC 5, IRAC 6.

Gray Mold of Multiple Crops - Botrytis Fungus

Non-Pesticide

Beans (Dry), Beans (Fresh), Southern Peas/Cowpeas | Avoid fields with a history of the problem. Rotate to a non-broadleaf crop, such as grass grains or sweet corn for >6 years. Prompt destruction of the finished crop with tillage to rapidly breakdown tissue is an important method to prevent disease build-up.

Pesticide

Cannonball WG (50) (fludioxonil) *Beans (Dry), Beans (Fresh), Southern Peas/Cowpeas* | 7 oz. per acre. Do not exceed 28 oz. per year. REI: 12-hour. PHI: 7-day. FRAC 12.

chlorothalonil products (chlorothalonil) *Beans (Fresh)* | Several formulations of chlorothalonil (Bravo, Echo, Equus) are labeled at various rates. See label for directions. REI: 12-hour. PHI: 7-day. FRAC M5.

Endura (WG) (boscalid) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 8-11 oz. per acre. REI: 12-hour. PHI: 7-day for fresh legumes, 21-day for dry legumes. FRAC 7.

Fontelis (1.67SC) (penthioopyrad) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 14-30 fl. oz. per acre. Rates above 20 fl. oz. per acre are for fresh legumes only. REI: 12-hour. PHI: 0-day for fresh legumes, 21-day for dry legumes. FRAC 7.

iprorodione products (iprorodione) *Beans (Dry), Beans (Fresh), Lima Beans* | 1.5-2 pts. per acre. Formulations of iprodione include Nevado and Rovral. Make up to two applications starting at first flower, and ending no later than peak bloom. REI: 24-hour. FRAC 2.

Omega 500F (4.17) (fluazinam) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 8-13.6 fl. oz. per acre. Do not exceed 27.2 fl. oz. per crop cycle. REI: 12-hour. PHI: 14-day for fresh legumes, 30-day for dry legumes. FRAC 29.

Switch 62.5WG (cyprodinil, fludioxonil) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 11-14 fl. oz. per acre. REI: 12-hour. PHI: 7-day. FRAC 9, FRAC 12.

Topsin 4.5FL (thiophanate-methyl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 4FL formulation or Cercobin at 20-40 fl. oz. per acre, or 70WSB formulation at 1-2 lb. per acre. REI: 24-hour to 3-day. PHI: 14-day for fresh legumes, 28-day for dry legumes. FRAC 1.

Halo Blight of Beans - Pseudomonas Bacteria

Non-Pesticide

Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | Plant western-grown, certified disease-free seed. Rotate to non-host crops for 2 years. Prompt destruction of the finished crop with tillage to rapidly breakdown tissue is an important method to prevent disease build-up.

Pesticide

copper products (copper hydroxide, copper octanoate, copper oxychloride, copper sulfate, copper diammonium diacetate complex, cuprous oxide) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Several formulations of copper (Badge, Champ, Kocide) are labelled for use and may slow the spread of bacterial blights. See label for directions. REI: 4 to 48-hour. PHI: 0-day. FRAC M1.

Nematodes

Non-Pesticide

Beans (Dry), Beans (Fresh), Lima Beans, Southern Peas/Cowpeas | Collect soil samples for nematodes in the fall and avoid fields with high numbers. Rotate to a non-broadleaf crop, such as grass grains or sweet corn for >3 years. Rotation interval depends on the nematode count in soil samples. Prompt destruction of the finished crop with tillage to rapidly breakdown tissue and displace nematodes

is an important method to prevent nematode build-up.

Rust of Legumes - Uromyces Fungus

Non-Pesticide

Beans (Dry), Southern Peas/Cowpeas | Rotate to non-host crops for 3-4 years. Resistant varieties are available,

Pesticide

Approach (2.08SC) (picoxystrobin) *Beans (Dry), Peas (Dry)* | 6-12 fl. oz. per acre. REI: 12-hour. PHI: 14-day. FRAC 11.

Aprovia Top (difenoconazole, benzovindiflupyr) *Beans (Dry), Peas (Dry)* | 10.5-11 fl. oz. per acre. A spreader sticker is recommended. REI: 12-hour. PHI: 14-day. FRAC 3, FRAC 7.

azoxystrobin products (azoxystrobin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 2 lb. a.i. per gallon formulations (Quadris) at 6.0-15.5 fl. oz. per acre. Use 3.3 lb. per gallon formulations (Azteroid) at 3.9-9.7 fl. oz. per acre. REI: 4-hour. PHI: 0-day for fresh legumes, 14-day for dry legumes. FRAC 11.

chlorothalonil products (chlorothalonil) *Beans (Fresh)* | Several formulations of chlorothalonil (Bravo, Echo, Equus) are labeled at various rates. See label for directions. REI: 12-hour. PHI: 7-day. FRAC M5.

Fontelis (1.67SC) (penthioopyrad) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 14-30 fl. oz. per acre. Rates above 20 fl. oz. per acre are for fresh legumes only. REI: 12-hour. PHI: 0-day for fresh legumes, 21-day for dry legumes. FRAC 7.

Headline (SC) (2.08) (pyraclostrobin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry),*

Legumes - Diseases

Peas (Fresh), Southern Peas/Cowpeas | 6-9 fl. oz. per acre. REI: 12-hour. PHI: 7-day for fresh. 21-days for dry. FRAC 11.

Priaxor (fluxapyroxad, pyraclostrobin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 4-8 fl. oz. per acre. REI: 12-hour. PHI: 7-day for fresh legumes, 21-day for dry legumes. FRAC 7, FRAC 11.

Proline 480SC (4) (prothioconazole) *Beans (Dry), Southern Peas/Cowpeas* | 5.7 fl. oz. per acre. REI: 12-hour. PHI: 7-day. FRAC 3.

propiconazole products (propiconazole) *Beans (Dry), Beans (Fresh), Lima Beans, Southern Peas/Cowpeas* | 4 fl. oz. per acre. PropiMax EC and Tilt are labeled. REI: 12-hour. PHI: 7-day for fresh legumes. FRAC 3.

Quadris Opti (SC) (azoxystrobin, chlorothalonil) *Beans (Dry)* | 1.6-2.4 pts. per acre. REI: 12-hour. PHI: 14-day. FRAC 11, FRAC M5.

Quilt (SE) (azoxystrobin, propiconazole) *Beans (Dry), Beans (Fresh), Southern Peas/Cowpeas* | 14 fl. oz. per acre. REI: 12-hour. PHI: 7-day for fresh legumes, 14-day for dry legumes. FRAC 11, FRAC 3.

Rally 40WSP (myclobutanil) *Beans (Fresh)* | 4-5 fl. oz. per acre. Snap beans only. REI: 24-hour. PHI: 0-day. FRAC 3.

Vertisan (1.67EC) (penthiopyrad) *Beans (Dry), Southern Peas/Cowpeas* | 14-20 fl. oz. per acre. REI: 12-hour. PHI: 21-day. FRAC 7.

Viruses of Multiple Crops - Multiple Pathogens

Bean Yellow Mosaic Virus (BYMV) overwinters in wild legumes, like sweet clover, and is spread by aphids.

Non-Pesticide

Beans (Dry), Beans (Fresh), Lima Beans | For **BYMV**: Keep new plantings as far as possible with the previous production area. Eliminating overwintering host plants such as wild sweet clover may reduce infection. Monitor for aphids and avoid broad-spectrum insecticides that might kill natural enemies and flare aphid populations. Some tolerant varieties are available. Prompt destruction of the finished crop with tillage to rapidly breakdown tissue is an important method to prevent disease build-up and transfer back to overwintering wild legumes.

Pesticide

Insecticides *Beans (Dry), Beans (Fresh), Lima Beans* | For **BYMV**: use aphid-specific insecticides to lower the population without also reducing the population of natural enemies. See insect section.

White Mold (Timber Rot, Drop, Stem Rot) of Multiple Crops - Sclerotinia Fungus

This soil pathogen is long-lived in the soil, and has a wide host range on broadleaved crops and weeds, including beans, vine crops, lettuce, tomatoes, peppers, and cole crops. It goes by other names in other crops, such as Drop, White Mold, Stem Rot, and Timber Rot.

It is more commonly where humidity and temperatures are high. The fungus often infects flowers, which then drop off and infect the stems that they land on. The stems take on a woody appearance and can split open. Inspection of the stems will reveal small black pellets that are the overwintering body of the pathogen.

Non-Pesticide

Beans (Dry), Beans (Fresh), Southern Peas/Cowpeas | Avoid fields with a history of the problem. Rotate to a non-broadleaf crop, such as grass grains or sweet corn for >6 years. Prompt

destruction of the finished crop with tillage to rapidly breakdown tissue is an important method to prevent disease build-up.

Pesticide

Approach (2.08SC) (picoxystrobin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 8-12 fl. oz. per acre. REI: 12-hour. PHI: 14-day. FRAC 11.

Cannonball WG (50) (fludioxonil) *Beans (Dry), Beans (Fresh), Southern Peas/Cowpeas* | 7 oz. per acre. Do not exceed 28 oz. per year. REI: 12-hour. PHI: 7-day. FRAC 12.

Contans WG (5) (Coniothyrium minitans strain CON/M/91-08) *Beans (Fresh)* | 1-6 lbs. per acre. Apply immediately after harvest or 3-4 months before planting. REI: 4-hour. PHI: 7-day. FRAC NC. *OMRI-listed.*

Endura (WG) (boscalid) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 8-11 oz. per acre. REI: 12-hour. PHI: 7-day for fresh legumes, 21-day for dry legumes. FRAC 7.

Fontelis (1.67SC) (penthiopyrad) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 16-30 fl. oz. per acre. Rates above 20 fl. oz. per acre for fresh legumes only. REI: 12-hour. PHI: 0-day for fresh legumes, 21-day for dry legumes. FRAC 7.

iprodione products (iprodione) *Beans (Dry), Beans (Fresh), Lima Beans* | 1.5-2 pts. per acre. Formulations of iprodione include Nevado and Rovral. Make up to two applications starting at first flower, and ending no later than peak bloom. REI: 24-hour. FRAC 2.

Omega 500F (4.17) (fluazinam) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 8-13.6 fl. oz. per acre. Do not exceed 27.2 fl. oz. per crop cycle. REI:

12-hour. PHI: 14-day for fresh legumes, 30-day for dry legumes. FRAC 29.

Proline 480SC (4) (prothioconazole) *Beans (Dry), Southern Peas/Cowpeas* | 5.7 fl. oz. per acre. REI: 12-hour. PHI: 7-day. FRAC 3.

Switch 62.5WG (cyprodinil, fludioxonil) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 11-14 fl. oz. per acre. REI: 12-hour. PHI: 7-day. FRAC 9, FRAC 12.

Topsin 4.5FL (thiophanate-methyl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 4FL formulation or Cercobin at 20-40 fl. oz. per acre, or 70WSB formulation at 1-2 lb. per acre. REI: 24-hour to 3-day. PHI: 14-day for fresh legumes, 28-day for dry legumes. FRAC 1.

Vertisan (1.67EC) (penthiopyrad) *Beans (Dry), Southern Peas/Cowpeas* | 16-20 fl. oz. per acre. REI: 12-hour. PHI: 21-day. FRAC 7.

Wilt of Multiple Crops - Fusarium Fungus

Non-Pesticide

Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | Avoid fields with a history of the disease. Rotate to non-Legume crops for >6 years. Resistant varieties are available. Prompt destruction of the finished crop with tillage to rapidly breakdown tissue is an important method to prevent disease build-up.

Legumes - Insects

Reviewed by Laura Ingwell, Anthony Hanson –
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Recommended Controls

Aphids

Pesticide

Admire Pro (4.6SC) (imidacloprid) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 7-10.5 fl. oz. per acre soil application, or 1.2 fl. oz. per acre foliar application. Do not exceed 1 soil application per season or 3 foliar applications per season. REI: 12-hour. PHI: 21-day for soil application, or 7-day for foliar application. IRAC 4A.

Asana XL (0.66EC) (esfenvalerate) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 5.8-9.6 fl. oz. per acre. Do not exceed 38.4 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 3-day for fresh legumes, 21-day for dry legumes. IRAC 3A. RUP.

Assail 30SG (acetamiprid) *Beans (Fresh), Lima Beans, Peas (Fresh), Southern Peas/Cowpeas* | Use 30SG formulations at 2.5-5.3 oz. per acre and do not exceed 16 oz. per acre per season. Use 70WP formulations at 1.0-2.3 oz. per acre and do not exceed 6.9 oz. per acre per season. Allow 7 days between applications. REI: 12-hour. PHI: 7-day. IRAC 4A.

Brigade 2EC (bifenthrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 2EC formulations at 2.1-6.4 fl. oz. per acre and do not exceed 12.8 fl. oz. per acre per season for fresh beans and fresh or dried peas or 19.2 fl. oz. per acre per season on dried beans. Use 10DF, 10WP, or 10WSB formulations at 5.3-16 oz. per acre on fresh beans

and peas only and do not exceed 32 oz. per acre per season. Allow 7 days between applications on fresh beans and peas, and 7 days between applications on dry beans and peas. REI: 12-hour. PHI: 3-day for fresh legumes, or 14-day for dry legumes. IRAC 3A. RUP.

Cruiser 5FS (thiamethoxam) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28 fl. oz. per 100 lbs. of seed. Do not apply a neonicotinoid insecticide within 45 days of planting treated seed. REI: 12-hour. IRAC 4A.

Dimethoate 4EC (dimethoate) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh)* | Use 2.67EC formulations at 0.75-1.5 pts. per acre on beans, or 0.5 pt. per acre on peas and do not exceed 3 pts. per acre per season on beans or 0.5 pt. per acre on peas. Not for use on Cowpeas/Southern Peas. Do not feed or graze livestock on treated plants. See pollinator precautions. Mechanical harvest only on day of application. REI: 48-hour. PHI: 0-day. IRAC 1B.

Lannate LV (2.4L) (methomyl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.5-3 pts. per acre. Do not exceed 15 pts. per acre per season. Do not feed or graze livestock on treated plants within 7 days of application for succulent legumes, or 14 days of application for dry legumes. REI: 48-hour. PHI: 1-day at rates less than 1.5 pts. per acre, or 3-day for rates over 1.5 pts. per acre on fresh legumes, or 14-day for any rate on dry legumes. IRAC 1A. RUP.

M-Pede (3.8) (potassium salts of fatty acids) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1-2% by volume. To achieve enhanced and residual pest control mix with a labeled companion insecticide. REI: 12-hour. PHI: 0-day. IRAC UN, FRAC NC. OMRI-listed.

Movento (2SC) (spirotetramat) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | 4.0-5.0 fl. oz. per acre. Do not exceed 5 fl. oz per acre per season. REI: 24-hour. PHI: 1-day for fresh legumes, or 7-day for dry legumes. IRAC 23.

Mustang Maxx (0.8) (zeta-cypermethrin) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | 2.72-4.0 fl. oz. Do not exceed 24 fl. oz. per acre per season. REI: 12-hour. PHI: 1-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. RUP.

Orthene 97 (S) (acephate) Beans (Dry), Lima Beans | 0.5-1.0 lb per acre. Do not exceed 2 1/8 lbs. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 1-day for fresh Lima Beans, or 14-day for dry legumes. IRAC 1B.

Sivanto 200 (1.67SL) (flupyradifurone) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | 7-10.5 fl. oz. per acre. Do not exceed 28 fl. oz. per acre per season. Allow 10 days between applications. REI: 4-hour. PHI: 7-day. IRAC 4D.

Thimet 20G (phorate) Beans (Dry), Beans (Fresh), Lima Beans | 4.5-7.0 oz. per 1,000 ft. of row. Drill granules to the side of the seed or in a band over the row and lightly incorporate with a drag chain. Granules must be incorporated into the soil. Do not place granules in direct contact with seed. Do not feed or graze livestock on treated plants. REI: 48-hour. PHI: 60-day. IRAC 1B. RUP.

Transform WG (50) (sulfoxaflor) Beans (Dry), Beans (Fresh), Lima Beans | 0.75-1.0 oz. per acre. Do not make applications less than 14 days apart or consecutively on the same crop. No more than four applications per crop. Maximum of 8.5 oz. per acre per year. REI: 24-hour. PHI: 7-day. IRAC 4C.

Warrior II (2.08CS) (lambda-cyhalothrin) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | 1.28-1.92

fl. oz. per acre. Do not exceed 7.68 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 7-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. RUP.

Bean Leaf Beetle

Treatment for Bean Leaf Beetle is warranted at a threshold of 1 beetle per foot of row.

Pesticide

Baythroid XL (1EC) (beta-cyfluthrin) Beans (Dry), Peas (Dry), Southern Peas/Cowpeas | 2.4-3.2 fl. oz. per acre. Do not exceed 6.4 fl. oz. per acre per season for succulent Cowpeas/Southern Peas, or 10.5 fl. oz. per acre per season for dry legumes. Allow 14 days between applications. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 3-day for for Cowpeas/Southern Peas, or 7-day for dry legumes. IRAC 3A. RUP.

Brigade 2EC (bifenthrin) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | Use 2EC formulations at 2.1-6.4 fl. oz. per acre and do not exceed 12.8 fl. oz. per acre per season for fresh beans and fresh or dried peas or 19.2 fl. oz. per acre per season on dried beans. Use 10DF, 10WP, or 10WSB formulations at 5.3-16 oz. per acre on fresh beans and peas only and do not exceed 32 oz. per acre per season. Allow 7 days between applications on fresh beans and peas, and 7 days between applications on dry beans and peas. REI: 12-hour. PHI: 3-day for fresh legumes, or 14-day for dry legumes. IRAC 3A. RUP.

Cruiser 5FS (thiamethoxam) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | 1.28 fl. oz. per 100 lbs. of seed. Do not apply a neonicotinoid insecticide within 45 days of planting treated seed. REI: 12-hour. IRAC 4A.

Dimethoate 4EC (dimethoate) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh) |

Legumes - Insects

Use 2.67EC formulations at 0.75-1.5 pts. per acre on beans, or 0.5 pt. per acre on peas and do not exceed 3 pts. per acre per season on beans or 0.5 pt. per acre on peas. Not for use on Cowpeas/Southern Peas. Do not feed or graze livestock on treated plants. See pollinator precautions. Mechanical harvest only on day of application. REI: 48-hour. PHI: 0-day. IRAC 1B.

Mustang Maxx (0.8) (zeta-cypermethrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 2.72-4.0 fl. oz. Do not exceed 24 fl. oz. per acre per season. REI: 12-hour. PHI: 1-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. RUP.

Orthene 97 (S) (acephate) *Beans (Dry), Lima Beans* | 0.5-1.0 lb per acre. Do not exceed 2 1/8 lbs. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 1-day for fresh Lima Beans, or 14-day for dry legumes. IRAC 1B.

Sevin XLR Plus (4SC) (carbaryl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.5-1.0 qts. per acre. Do not exceed 6 qts. per acre per season. Do not use on shelled succulent peas and beans. Edible-pod succulent and dried shelled beans and peas only. REI: 12-hour. PHI: 3-day for fresh legumes, 14-day for dry legumes. IRAC 1A.

Warrior II (2.08CS) (lambda-cyhalothrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28-1.92 fl. oz. per acre. Do not exceed 7.68 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 7-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. RUP.

Caterpillars

There are many caterpillar pests of legumes, including European corn borer, corn earworm/tomato fruitworm, alfalfa caterpillars, cutworms, loopers, and armyworms. Always check

the label for the specific list of caterpillars that the product can be used on.

Pesticide

Asana XL (0.66EC) (esfenvalerate) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 5.8-9.6 fl. oz. per acre. For armyworms, corn borers, cutworms, earworms, and loopers. Do not exceed 38.4 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 3-day for fresh legumes, 21-day for dry legumes. IRAC 3A. RUP.

Baythroid XL (1EC) (beta-cyfluthrin) *Beans (Dry), Peas (Dry), Southern Peas/Cowpeas* | 0.8-3.2 fl. oz. per acre. For armyworms, corn borers, earworms, and loopers. Do not exceed 6.4 fl. oz. per acre per season for succulent Cowpeas/Southern Peas, or 10.5 fl. oz. per acre per season for dry legumes. Allow 14 days between applications. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 3-day for Cowpeas/Southern Peas, or 7-day for dry legumes. IRAC 3A. RUP.

Brigade 2EC (bifenthrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | For armyworms, corn borers, cutworms, earworms, and loopers. Use 2EC formulations at 2.1-6.4 fl. oz. per acre and do not exceed 12.8 fl. oz. per acre per season for fresh beans and fresh or dried peas or 19.2 fl. oz. per acre per season on dried beans. Use 10DF, 10WP, or 10WSB formulations at 5.3-16 oz. per acre on fresh beans and peas only and do not exceed 32 oz. per acre per season. Allow 7 days between applications on fresh beans and peas, and 7 days between applications on dry beans and peas. REI: 12-hour. PHI: 3-day for fresh legumes, or 14-day for dry legumes. IRAC 3A. RUP.

Coragen (1.67SC) (chlorantraniliprole) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 3.5-7.5 fl. oz. per acre. For armyworms, corn borers, cutworms, earworms, and loopers. Do not exceed

15.4 fl. oz. per acre per season. Allow 3 days between applications. REI: 4-hour. PHI: 1-day. IRAC 28.

Entrust SC (2) (spinosad) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 3-6 oz. per acre. For armyworms, corn borers, earworms, and loopers. Use 2SC formulations at 3.0-6.0 fl. oz. per acre and do not exceed 29 fl. oz. per acre per season on succulent legumes or 12 fl. oz. on dried legumes. Use 80WP formulations at 1.0-2.0 oz. per acre and do not exceed 9 oz. per acre per season on succulent legumes or 3.75 oz. on dried legumes. Observe resistance management restrictions. Allow 5 days between applications. Do not feed or graze livestock on treated plants. REI: 4-hour. PHI: 3-day for fresh legumes, or 28-day for dry legumes. IRAC 5. *OMRI-listed.*

Intrepid 2F (methoxyfenozide) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 4-16 fl. oz. per acre. For armyworms, corn borers, earworms, and loopers. Use 4-8 fl. oz. on young plants in early season. Use 8-16 fl. oz. for mid- to late-season applications or heavier infestations. Do not exceed 64 fl. oz. per acre per season. Allow 7 days between applications. REI: 4-hour. PHI: 7-day. IRAC 18.

Lannate LV (2.4L) (methomyl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.5-3 pts. per acre. For armyworms, corn borers, earworms, and loopers. Do not exceed 15 pts. per acre per season. Do not feed or graze livestock on treated plants within 7 days of application for succulent legumes, or 14 days of application for dry legumes. REI: 48-hour. PHI: 1-day at rates less than 1.5 pts. per acre, or 3-day for rates over 1.5 pts. per acre on fresh legumes, or 14-day for any rate on dry legumes. IRAC 1A. *RUP.*

Mustang Maxx (0.8) (zeta-cypermethrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 2.72-4.0 fl.

oz. For armyworms, corn borers, earworms, and loopers. Do not exceed 24. fl. oz. per acre per season. REI: 12-hour. PHI: 1-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. *RUP.*

Orthene 97 (S) (acephate) *Beans (Dry), Lima Beans* | 0.5-1.0 lb per acre. For armyworms, corn borers, cutworms, earworms, and loopers. Do not exceed 2 1/8 lbs. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 1-day for fresh Lima Beans, or 14-day for dry legumes. IRAC 1B.

Radiant 1SC (spinetoram) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 3-8 fl. oz. per acre. For armyworms, corn borers, earworms, and loopers. Do not exceed 28 fl. oz. per acre. per season for succulent legumes, or 12 fl. oz. per acre for dry legumes. REI: 4-hour. PHI: 3-day for fresh legumes, or 28-day for dry legumes. IRAC 5.

Sevin XLR Plus (4SC) (carbaryl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.5-1.5 qts. per acre. For armyworms, corn borers, cutworms, and earworms. Do not exceed 6 qts. per acre per season. Do not use on shelled succulent peas and beans. Edible-pod succulent and dried shelled beans and peas only. REI: 12-hour. PHI: 3-day for fresh legumes, 14-day for dry legumes. IRAC 1A.

Warrior II (2.08CS) (lambda-cyhalothrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28-1.92 fl. oz. per acre. For armyworms, corn borers, cutworms, earworms, and loopers. Do not exceed 7.68 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 7-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. *RUP.*

Cowpea Curculio Beetle**Pesticide**

Asana XL (0.66EC) (esfenvalerate) *Beans (Dry), Peas (Dry)* | 4.8-9.6 fl. oz. per acre. Do not exceed 38.4 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 21-day. IRAC 3A. RUP.

Baythroid XL (1EC) (beta-cyfluthrin) *Beans (Dry), Peas (Dry), Southern Peas/Cowpeas* | 1.6-2.4 fl. oz. per acre. Do not exceed 6.4 fl. oz. per acre per season for succulent Cowpeas/Southern Peas, or 10.5 fl. oz. per acre per season for dry legumes. Allow 14 days between applications. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 3-day for Cowpeas/Southern Peas, or 7-day for dry legumes. IRAC 3A. RUP.

Mustang Maxx (0.8) (zeta-cypermethrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 2.72-4.0 fl. oz. Do not exceed 24 fl. oz. per acre per season. REI: 12-hour. PHI: 1-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. RUP.

Sevin XLR Plus (4SC) (carbaryl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.5-1.5 qts. per acre. Do not exceed 6 qts. per acre per season. Do not use on shelled succulent peas and beans. Edible-pod succulent and dried shelled beans and peas only. REI: 12-hour. PHI: 3-day for fresh legumes, 14-day for dry legumes. IRAC 1A.

Warrior II (2.08CS) (lambda-cyhalothrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28-1.92 fl. oz. per acre. Do not exceed 7.68 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 7-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. RUP.

Leafhoppers

Treatment for potato leafhopper is warranted at the following thresholds.

Seedlings: 0.5 per sweep, or 2 per row foot.

3rd trifoliolate: 1 per sweep, or 5 per row foot.

Bud stage: 5 per row foot.

Pesticide

Admire Pro (4.6SC) (imidacloprid) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 7-10.5 fl. oz. per acre soil application, or 1.2 fl. oz. per acre foliar application. Do not exceed 1 soil application per season or 3 foliar applications per season. REI: 12-hour. PHI: 21-day for soil application, or 7-day for foliar application. IRAC 4A.

Asana XL (0.66EC) (esfenvalerate) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 5.8-9.6 fl. oz. per acre. Do not exceed 38.4 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 3-day for fresh legumes, 21-day for dry legumes. IRAC 3A. RUP.

Assail 30SG (acetamiprid) *Beans (Fresh), Lima Beans, Peas (Fresh), Southern Peas/Cowpeas* | Use 30SG formulations at 2.5-5.3 oz. per acre and do not exceed 16 oz. per acre per season. Use 70WP formulations at 1.0-2.3 oz. per acre and do not exceed 6.9 oz. per acre per season. Allow 7 days between applications. REI: 12-hour. PHI: 7-day. IRAC 4A.

Baythroid XL (1EC) (beta-cyfluthrin) *Beans (Dry), Peas (Dry), Southern Peas/Cowpeas* | 0.8-1.6 fl. oz. per acre. Do not exceed 6.4 fl. oz. per acre per season for succulent Cowpeas/Southern Peas, or 10.5 fl. oz. per acre per season for dry legumes. Allow 14 days between applications. Do not feed or graze livestock on treated plants. REI: 12-hour.

PHI: 3-day for fresh Cowpeas/Southern Peas, or 7-day for dry legumes. IRAC 3A. *RUP*.

Brigade 2EC (bifenthrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 2EC formulations at 1.6-6.4 fl. oz. per acre and do not exceed 12.8 fl. oz. per acre per season for fresh beans and fresh or dried peas or 19.2 fl. oz. per acre per season on dried beans. Use 10DF, 10WP, or 10WSB formulations at 4-16 oz. per acre on fresh beans and peas only and do not exceed 32 oz. per acre per season. Allow 7 days between applications on fresh beans and peas, and 7 days between applications on dry beans and peas. REI: 12-hour. PHI: 3-day for fresh legumes, or 14-day for dry legumes. IRAC 3A. *RUP*.

Cruiser 5FS (thiamethoxam) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28 fl. oz. per 100 lbs. of seed. Do not apply a neonicotinoid insecticide within 45 days of planting treated seed. REI: 12-hour. IRAC 4A.

Dimethoate 4EC (dimethoate) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh)* | Use 2.67EC formulations at 0.75-1.5 pts. per acre on beans, or 0.5 pt. per acre on peas and do not exceed 3 pts. per acre per season on beans or 0.5 pt. per acre on peas. Not for use on Cowpeas/Southern Peas. Do not feed or graze livestock on treated plants. See pollinator precautions. Mechanical harvest only on day of application. REI: 48-hour. PHI: 0-day. IRAC 1B.

Lannate LV (2.4L) (methomyl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.75-3 pts. per acre. Do not exceed 15 pts. per acre per season. Do not feed or graze livestock on treated plants within 7 days of application for succulent legumes, or 14 days of application for dry legumes. REI: 48-hour. PHI: 1-day at rates less than 1.5 pts. per acre, or 3-day for rates over 1.5 pts. per acre on fresh legumes,

or 14-day for any rate on dry legumes. IRAC 1A. *RUP*.

M-Pede (3.8) (potassium salts of fatty acids) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1-2% by volume. To achieve enhanced and residual pest control mix with a labeled companion insecticide. REI: 12-hour. PHI: 0-day. IRAC UN, FRAC NC. *OMRI-listed*.

Mustang Maxx (0.8) (zeta-cypermethrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 2.72-4.0 fl. oz. Do not exceed 24 fl. oz. per acre per season. REI: 12-hour. PHI: 1-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. *RUP*.

Orthene 97 (S) (acephate) *Beans (Dry), Lima Beans* | 0.5-1.0 lb per acre. Do not exceed 2 1/8 lbs. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 1-day for fresh Lima Beans, or 14-day for dry legumes. IRAC 1B.

Sivanto 200 (1.67SL) (flupyradifurone) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 7-10.5 fl. oz. per acre. Do not exceed 28 fl. oz. per acre per season. Allow 10 days between applications. REI: 4-hour. PHI: 7-day. IRAC 4D.

Thimet 20G (phorate) *Beans (Dry), Beans (Fresh), Lima Beans* | 4.5-7.0 oz. per 1,000 ft. of row. Drill granules to the side of the seed or in a band over the row and lightly incorporate with a drag chain. Granules must be incorporated into the soil. Do not place granules in direct contact with seed. Do not feed or graze livestock on treated plants. REI: 48-hour. PHI: 60-day. IRAC 1B. *RUP*.

Warrior II (2.08CS) (lambda-cyhalothrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28-1.92 fl. oz. per acre. Do not exceed 7.68 fl. oz. per acre per season. Do not feed or graze livestock on treated

Legumes - Insects

plants. REI: 24-hour. PHI: 7-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. RUP.

Mexican Bean Beetle

Treatment for Mexican Bean Beetle is warranted at a threshold of 0.5 beetle per plant.

Pesticide

Asana XL (0.66EC) (esfenvalerate) Beans (Fresh), Lima Beans, Peas (Fresh), Southern Peas/Cowpeas | 2.9-5.8 fl. oz. per acre. Do not exceed 38.4 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 3-day for succulent legumes, 21-day for dry legumes. IRAC 3A. RUP.

Baythroid XL (1EC) (beta-cyfluthrin) Beans (Dry), Peas (Dry), Southern Peas/Cowpeas | 2.4-3.2 fl. oz. per acre. Do not exceed 6.4 fl. oz. per acre per season for succulent Cowpeas/Southern Peas, or 10.5 fl. oz. per acre per season for dry legumes. Allow 14 days between applications. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 3-day for for Cowpeas/Southern Peas, or 7-day for dry legumes. IRAC 3A. RUP.

Brigade 2EC (bifenthrin) Beans (Dry), Lima Beans, Peas (Dry), Southern Peas/Cowpeas | 2.1-6.4 fl. oz. per acre. Treat Mexican Bean Leaf Beetle on dry peas and beans only. Use 2EC formulations at 2.1-6.4 fl. oz. per acre and do not exceed 12.8 fl. oz. per acre per season for dried peas or 19.2 fl. oz. per acre per season on dried beans. Do not use 10DF, 10WP, or 10WSB formulations as they are labeled for fresh beans and peas only. Allow 7 days between applications on dry beans and peas. REI: 12-hour. PHI: 14-day. IRAC 3A. RUP.

Cruiser 5FS (thiamethoxam) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | 1.28 fl. oz. per 100 lbs. of seed. Do not apply a neonicotinoid insecticide within 45 days of planting treated seed. REI: 12-hour. IRAC 4A.

Dimethoate 4EC (dimethoate) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh) | Use 2.67EC formulations at 0.75-1.5 pts. per acre on beans, or 0.5 pt. per acre on peas and do not exceed 3 pts. per acre per season on beans or 0.5 pt. per acre on peas. Not for use on Cowpeas/Southern Peas. Do not feed or graze livestock on treated plants. See pollinator precautions. Mechanical harvest only on day of application. REI: 48-hour. PHI: 0-day. IRAC 1B.

Lannate LV (2.4L) (methomyl) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | 0.75-3 pts. per acre. Do not exceed 15 pts. per acre per season. Do not feed or graze livestock on treated plants within 7 days of application for succulent legumes, or 14 days of application for dry legumes. REI: 48-hour. PHI: 1-day at rates less than 1.5 pts. per acre, or 3-day for rates over 1.5 pts. per acre on fresh legumes, or 14-day for any rate on dry legumes. IRAC 1A. RUP.

Mustang Maxx (0.8) (zeta-cypermethrin) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | 2.72-4.0 fl. oz. Do not exceed 24 fl. oz. per acre per season. REI: 12-hour. PHI: 1-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. RUP.

Orthene 97 (S) (acephate) Beans (Dry), Lima Beans | 0.5-1.0 lb per acre. Do not exceed 2 1/8 lbs. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 1-day for fresh Lima Beans, or 14-day for dry legumes. IRAC 1B.

Sevin XLR Plus (4SC) (carbaryl) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | 0.5-1.0 qts. per acre. Do not exceed 6 qts. per acre per season. Do not use on shelled succulent peas and beans. Edible-pod succulent and dried shelled beans and peas only. REI: 12-hour. PHI: 3-day for fresh legumes, 14-day for dry legumes. IRAC 1A.

Thimet 20G (phorate) *Beans (Dry), Beans (Fresh), Lima Beans* | 4.9-9.4 oz. per 1,000 ft. of row. Drill granules to the side of the seed or in a band over the row and lightly incorporate with a drag chain. Granules must be incorporated into the soil. Do not place granules in direct contact with seed. Do not feed or graze livestock on treated plants. REI: 48-hour. PHI: 60-day. IRAC 1B. *RUP*.

Warrior II (2.08CS) (lambda-cyhalothrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.96-1.6 fl. oz. per acre. Do not exceed 7.68 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 7-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. *RUP*.

Mites

Pesticide

Acramite 50WS (bifenazate) *Beans (Fresh), Lima Beans, Peas (Fresh), Southern Peas/Cowpeas* | 1-1.5 lbs. per acre. Do not exceed 2 applications per season. REI: 12-hour. PHI: 3-day. IRAC UN.

Agri-Mek SC (0.7) (abamectin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.75-3.5 fl. oz. per acre. Not for cowpeas grown for fresh use. Do not exceed 10.25 fl. oz. per acre per season and do not make more than 2 sequential applications. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 7-day. IRAC 6. *RUP*.

Portal (0.4EC) (fenpyroximate) *Beans (Fresh)* | 2 pts. per acre. Do not exceed 4 pts. per acre per season. REI: 12-hour. PHI: 1-day. IRAC 21A.

Pea Weevil Beetle

Pesticide

Baythroid XL (1EC) (beta-cyfluthrin) *Beans (Dry), Peas (Dry), Southern Peas/Cowpeas* | 2.4-3.2 fl. oz. per acre. Do not exceed 6.4 fl. oz. per acre

per season for succulent Cowpeas/Southern Peas, or 10.5 fl. oz. per acre per season for dry legumes. Allow 14 days between applications. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 3-day for for Cowpeas/Southern Peas, or 7-day for dry legumes. IRAC 3A. *RUP*.

Brigade 2EC (bifenthrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 2EC formulations at 2.1-6.4 fl. oz. per acre and do not exceed 12.8 fl. oz. per acre per season for fresh beans and fresh or dried peas or 19.2 fl. oz. per acre per season on dried beans. Use 10DF, 10WP, or 10WSB formulations at 5.3-16 oz. per acre on fresh beans and peas only and do not exceed 32 oz. per acre per season. Allow 7 days between applications on fresh beans and peas, and 7 days between applications on dry beans and peas. REI: 12-hour. PHI: 3-day for fresh legumes, or 14-day for dry legumes. IRAC 3A. *RUP*.

Mustang Maxx (0.8) (zeta-cypermethrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 2.72-4.0 fl. oz. Do not exceed 24 fl. oz. per acre per season. REI: 12-hour. PHI: 1-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. *RUP*.

Sevin XLR Plus (4SC) (carbaryl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.5-1.5 qts. per acre. Do not exceed 6 qts. per acre per season. Do not use on shelled succulent peas and beans. Edible-pod succulent and dried shelled beans and peas only. REI: 12-hour. PHI: 3-day for fresh legumes, 14-day for dry legumes. IRAC 1A.

Warrior II (2.08CS) (lambda-cyhalothrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28-1.92 fl. oz. per acre. Do not exceed 7.68 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 7-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. *RUP*.

Seed and Root Maggots

Non-Pesticide

Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | Plant after the peak flight and egg-laying window of the first generation of flies looking to lay eggs around 360 GDD base 40. Handle seeds carefully to prevent cracking. Plow winter vegetation under early in the spring and thoroughly cover to limit attractiveness of rotting vegetation to the first generation of flies to lay eggs on.

Pesticide

Capture LFR (1.5) (bifenthrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.2-0.39 fl. oz. per 1,000 ft. of row. Apply as a 5-7 inch band over the row on the soil surface, open furrow, or in-furrow at planting. REI: 12-hour. IRAC 3A. RUP.

Cruiser 5FS (thiamethoxam) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28 fl. oz. per 100 lbs. of seed. Do not apply a neonicotinoid insecticide within 45 days of planting treated seed. REI: 12-hour. IRAC 4A.

Lorsban 4E (chlorpyrifos) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 4E formulations at 2 pts. per acre or 1.8 fl. oz. per 1,000 ft. of row. Use 75WG formulations at 1.33 lbs. per acre. For planting applications, spray 3-5 inch band over row behind planter show and in front of press wheel to achieve shallow incorporation. Do not make more than one application per year. REI: 24-hour to 3-day. IRAC 1B. RUP.

Thimet 20G (phorate) *Beans (Dry), Beans (Fresh), Lima Beans* | 4.5-7.0 oz. per 1,000 ft. of row. Drill granules to the side of the seed or in a band over the row and lightly incorporate with a drag chain. Granules must be incorporated into the soil. Do not

place granules in direct contact with seed. Do not feed or graze livestock on treated plants. REI: 48-hour. PHI: 60-day. IRAC 1B. RUP.

Stink Bugs

Pesticide

Baythroid XL (1EC) (beta-cyfluthrin) *Beans (Dry), Peas (Dry), Southern Peas/Cowpeas* | 1.6-2.4 fl. oz. per acre. Do not exceed 6.4 fl. oz. per acre per season for succulent Cowpeas/Southern Peas, or 10.5 fl. oz. per acre per season for dry legumes. Allow 14 days between applications. Do not feed or graze livestock on treated plants. REI: 12-hour. PHI: 3-day for for Cowpeas/Southern Peas, or 7-day for dry legumes. IRAC 3A. RUP.

Brigade 2EC (bifenthrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 2EC formulations at 2.1-6.4 fl. oz. per acre and do not exceed 12.8 fl. oz. per acre per season for fresh beans and fresh or dried peas or 19.2 fl. oz. per acre per season on dried beans. Use 10DF, 10WP, or 10WSB formulations at 5.3-16 oz. per acre on fresh beans and peas only and do not exceed 32 oz. per acre per season. Allow 7 days between applications on fresh beans and peas, and 7 days between applications on dry beans and peas. REI: 12-hour. PHI: 3-day for fresh legumes, or 14-day for dry legumes. IRAC 3A. RUP.

Lannate LV (2.4L) (methomyl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.5-3 pts. per acre. Do not exceed 15 pts. per acre per season. Do not feed or graze livestock on treated plants within 7 days of application for succulent legumes, or 14 days of application for dry legumes. REI: 48-hour. PHI: 1-day at rates less than 1.5 pts. per acre, or 3-day for rates over 1.5 pts. per acre on fresh legumes, or 14-day for any rate on dry legumes. IRAC 1A. RUP.

Mustang Maxx (0.8) (zeta-cypermethrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 2.72-4.0 fl. oz. Do not exceed 24 fl. oz. per acre per season. REI: 12-hour. PHI: 1-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. *RUP*.

Sevin XLR Plus (4SC) (carbaryl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.5-1.5 qts. per acre. Do not exceed 6 qts. per acre per season. Do not use on shelled succulent peas and beans. Edible-pod succulent and dried shelled beans and peas only. REI: 12-hour. PHI: 3-day for fresh legumes, 14-day for dry legumes. IRAC 1A.

Transform WG (50) (sulfoxaflor) *Beans (Dry), Beans (Fresh), Lima Beans* | 2.25 oz. per acre. *Suppression only*. Do not make applications less than 14 days apart or consecutively on the same crop. No more than four application per crop. Maximum of 8.5 oz. per acre per year. REI: 24-hour. PHI: 7-day. IRAC 4C.

Warrior II (2.08CS) (lambda-cyhalothrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28-1.92 fl. oz. per acre. Do not exceed 7.68 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 7-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. *RUP*.

Thrips

Pesticide

Admire Pro (4.6SC) (imidacloprid) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 7-10.5 fl. oz. per acre soil application. Do not exceed 1 soil application per season. REI: 12-hour. PHI: 21-day. IRAC 4A.

Assail 30SG (acetamiprid) *Beans (Fresh), Lima Beans, Peas (Fresh), Southern Peas/Cowpeas* | Use 30SG formulations at 4.5-5.3 oz. per acre and do

not exceed 16 oz. per acre per season. Use 70WP formulations at 1.9-2.3 oz. per acre and do not exceed 6.9 oz. per acre per season. Allow 7 days between applications. REI: 12-hour. PHI: 7-day. IRAC 4A.

Brigade 2EC (bifenthrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 2EC formulations at 2.1-6.4 fl. oz. per acre and do not exceed 12.8 fl. oz. per acre per season for fresh beans and fresh or dried peas or 19.2 fl. oz. per acre per season on dried beans. Use 10DF, 10WP, or 10WSB formulations at 5.3-16 oz. per acre on fresh beans and peas only and do not exceed 32 oz. per acre per season. Allow 7 days between applications on fresh beans and peas, and 7 days between applications on dry beans and peas. REI: 12-hour. PHI: 3-day for fresh legumes, or 14-day for dry legumes. IRAC 3A. *RUP*.

Entrust SC (2) (spinosad) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 2SC formulations at 4.5-6.0 fl. oz. per acre and do not exceed 29 fl. oz. per acre per season on succulent legumes or 12 fl. oz. on dried legumes. Use 80WP formulations at 1.0-2.5 oz. per acre and do not exceed 9 oz. per acre per season on succulent legumes or 3.75 oz. on dried legumes. Observe resistance management restrictions. Allow 5 days between applications. Do not feed or graze livestock on treated plants. REI: 4-hour. PHI: 3-day for fresh legumes, or 28 day for dry legumes. IRAC 5. *OMRI-listed*.

Mustang Maxx (0.8) (zeta-cypermethrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 2.72-4.0 fl. oz. Do not exceed 24 fl. oz. per acre per season. REI: 12-hour. PHI: 1-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. *RUP*.

Radiant 1SC (spinetoram) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 5-8 fl. oz. per acre. Do not exceed 28 fl. oz. per acre. per season for

Legumes - Weeds

succulent legumes, or 12 fl. oz. per acre for dry legumes. REI: 4-hour. PHI: 3-day for fresh legumes, or 28-day for dry legumes. IRAC 5.

Sevin XLR Plus (4SC) (carbaryl) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.5-1.5 qts. per acre. Do not exceed 6 qts. per acre per season. Do not use on shelled succulent peas and beans. Edible-pod succulent and dried shelled beans and peas only. REI: 12-hour. PHI: 3-day for fresh legumes, 14-day for dry legumes. IRAC 1A.

Transform WG (50) (sulfoxaflor) *Beans (Dry), Beans (Fresh), Lima Beans* | 2.25 oz. per acre. *Suppression only.* Do not make applications less than 14 days apart or consecutively on the same crop. No more than four application per crop. Maximum of 8.5 oz. per acre per year. REI: 24-hour. PHI: 7-day. IRAC 4C.

Warrior II (2.08CS) (lambda-cyhalothrin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28-1.92 fl. oz. per acre. Do not exceed 7.68 fl. oz. per acre per season. Do not feed or graze livestock on treated plants. REI: 24-hour. PHI: 7-day for fresh legumes, or 21-day for dry legumes. IRAC 3A. *RUP.*

Wireworms

Pesticide

Cruiser 5FS (thiamethoxam) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1.28 fl. oz. per 100 lbs. of seed. Do not apply a neonicotinoid insecticide within 45 days of planting treated seed. REI: 12-hour. IRAC 4A.

Legumes - Weeds

Reviewed by Stephen Meyers, Ben Phillips – Nov 2020

Recommended Controls

All Weeds

Weed control methods in legumes vary by production system and crop. The challenges for those who rely on herbicides include the chance of injuring crops under adverse weather, the relatively short residual of preemergence herbicides, and replant restrictions for other vegetable crops for certain legume herbicides that are shared with field crops.

For legumes that are no-till direct-seeded into a killed crop (such as after a rye cover crop, or wheat) growers often use a burndown herbicide with a preemergence herbicide. If residue is not sufficient to suppress later-emerging weeds, growers may use postemergence herbicides, or shielded applications of nonselective herbicides.

For legumes direct-seeded into tilled soil, growers often combine one or more preemergence herbicides at planting with one or more cultivations. Sometimes, growers also apply a preemergence herbicide at the last cultivation to improve control of late-emerging weeds. If needed, growers may use postemergence herbicides or shielded applications of nonselective herbicides.

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

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

Non-Pesticide

Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | Weed pressure may be substantially reduced when growers prepare seedbeds several weeks in advance of planting and kill the first one or two flushes of weeds before planting without stirring up new weed seeds. Legumes lend themselves to this stale seedbed practice because they are often planted after common weeds have emerged in tilled soil. Uniform and close plant spacing in the row promotes rapid canopy cover, and fresh market growers can keep larger between row spacing clean with between row cultivation tools for hand-picking or towable mechanical harvesters. For densely populated broad acre mechanically-harvested processing crops, rolling cultivators on wide tool-bars offer effective high-speed cultivation.

Broadleaf and Grass Weeds - Postemergence

Pesticide

glyphosate products (glyphosate) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.75-3.75 lbs. acid equivalent (ae) per acre. Use formulations of 3 lbs. ae per gal. (4 lbs. isopropylamine salt per gal.) at 1-5 qts. per acre, or formulations containing 4.5 lbs. ae per gal. (5 lbs. potassium salt per gal.) at 0.66-3.3 qts. per acre. Broadcast before or after planting but before crop emerges, or apply up to 0.75 lb. acid equivalent between crop rows with wipers, hooded or shielded sprayers. Use low rate for annuals and higher rates for perennials. See label for suggested application volume and adjuvants. REI: 4 to 12-hour. PHI: 14-day. WSSA 9.

Lorox DF (50) (linuron) *Peas (Dry)* | 1-2 lbs. per acre. For **dry peas and dry southern peas/cowpeas**: apply after seeding but before crop emerges. Do not apply to sand or loamy sand. Do

not use on soils with less than 1% organic matter. REI: 24-hour to 8-day. WSSA 7.

paraquat products (paraquat) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | For **succulent legumes**: apply 2-4 pts. per acre before seeding or after seeding but before crop emergence. For **dry legumes**: apply 1.2-2.0 pts. per acre as a harvest-aid. Use 4-8 fl. oz. of NIS per 25 gals. of spray solution. REI: 12 to 24-hour. PHI: 7-day for dry legume harvest-aid applications. WSSA 22. RUP.

Pursuit (2) (imazethapyr) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Southern Peas/Cowpeas* | For **fresh beans in Illinois, Indiana, Iowa, Michigan, and Minnesota only**: apply and 1.5 fl. oz. per acre and incorporate within 1 week of planting, or apply within 1 day after planting. *In Missouri only*, a postemergence application can be mixed with Basagran after crop has at least one true leaf. Apply before July 31. For **dry beans and peas, Lima beans, and Southern peas/cowpeas**: apply 3 fl. oz. per acre and incorporate within 1 week of planting, or apply within 3 days after planting before crop emerges, or apply after crop has 1 fully expanded trifoliolate leaf or peas or cowpeas are at least three inches tall. *Early postemergence application not allowed on lima beans.* Use 8 oz. of NIS per 25 gals. of spray solution if emerged weeds are present. If using COC or N fertilizer on dry beans to improve weed control, add Basagran at 6-16 fl. oz. per acre or Result at 12-24 fl. oz. per acre to minimize crop injury. In all cases, do not apply to fields treated with trifluralin or injury may occur. In Minnesota north of Highway 210 and in Michigan on sandy or sandy loam soils do not apply more than 2 fl. oz. per acre. REI: 4-hour. PHI: 30-day for succulent legumes, 60-day for dry legumes. WSSA 2.

Raptor (1) (imazamox) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh)* | 4 fl. oz. per acre. For **dry beans and peas**: apply 4 fl. oz. per acre after the first trifoliolate is fully expanded for beans, or first three pairs of leaves for peas. May

Legumes - Weeds

add NIS, COC or N fertilizer. Must add Basagran or Rezult for dry peas. For **fresh peas**: apply 3 fl. oz. per acre when crop is at least 3 inches tall but prior to 5 nodes before flowering. Must add NIS. May add COC or N fertilizer. If using COC, you must add Basagran or Rezult. For **fresh beans in Illinois, Indiana, Iowa, Michigan, and Minnesota**: apply 4 fl. oz. per acre after the first trifoliolate is fully expanded and before bloom. Must add NIS. Do not add COC. May add N fertilizer. Must add Basagran or Rezult. For **succulent Lima beans**: apply 4 fl. oz. per acre when first or second trifoliolate is fully expanded and before bloom. Must add NIS. Must add Basagran or Rezult. **Notes:** Use NIS with at least 80% active ingredient at 1 qt. per 100 gals. of spray solution, or 1 gal. COC per 100 gals. of spray solution, or 2.5 gals. of nitrogen or 12-15 lbs. ammonium sulfate per 100 gals. of spray solution to improve weed control (but may increase crop injury). Use Basagran at 6-16 fl. oz. per acre or Rezult at 12-24 fl. oz. per acre to minimize crop injury. In all cases, Raptor is most effective on weeds less than 3 inches tall, and the 3 fl. oz. rate is weak on grasses. Using Raptor on fields treated with trifluralin may increase the risk of injury. Do not exceed 1 application per year. REI: 4-hour. PHI: 30-day when tank mixed with Basagran or Rezult. WSSA 2.

Rezult (5L) (bentazon, sethoxydim) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 3.2 pts. per acre. Apply when weeds are small and after peas have 3 pairs of leaves or first trifoliolate leaf of beans is fully expanded. An additional application of Basagran is allowed not to exceed 2 pts. per acre, and an additional application of Poast is allowed at 2.9 pts. per acre. REI: 48-hour. PHI: 30-day. WSSA 6, WSSA 1.

Broadleaf and Grass Weeds - Preemergence

Pesticide

Command 3ME (clomazone) *Beans (Fresh), Peas (Fresh)* | 1.3 pts. per acre. For **fresh beans**: apply 0.4-0.67 pt. per acre. For **fresh peas**: apply 1.3 pts. per acre. Broadcast before planting, or after planting before crop emerges. Not effective on muck soil. REI: 12-hour. PHI: 45-day for succulent beans. WSSA 13.

Dual Magnum (7.62EC) (s-metolachlor) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 1-2 pts. per acre. For **fresh and dry peas**: apply after seeding before crop emerges. Do not incorporate. For **fresh and dry beans, and southern peas/cowpeas, and lima beans**: apply and incorporate before planting, or apply after seeding but before crop emerges. Can be tank-mixed preplant incorporated with Eptam or trifluralin. Do not use on muck soils. In all cases, use lower rates on coarse soils. Do not use on muck soils. Dual II Magnum contains a safener and may be used instead of Dual Magnum to limit crop injury under cool soil conditions. REI: 24-hour. WSSA 15.

Eptam 7E (EPTC) *Beans (Dry), Beans (Fresh)* | 3.5 pts. per acre. Eptam 7E at 3.5 pts. per acre, or Eptam 20G at 15lbs. per acre. Apply before planting and incorporate immediately, or apply as a directed spray at last cultivation before pods start to form. Check label for sensitive types and varieties. *Green beans and small white beans on coarse soils*: do not exceed 3.5 pts. per acre (7E) or 15 lbs. per acre (20G). Suppresses nutsedge. REI: 12-hour. WSSA 8.

Lorox DF (50) (linuron) *Peas (Dry)* | 1-2 lbs. per acre. For **dry peas and dry southern peas/cowpeas**: apply after seeding but before crop emerges. Do not apply to sand or loamy sand. Do not use on soils with less than 1% organic matter. REI: 24-hour to 8-day. WSSA 7.

Outlook (6) (dimethenamid-p) *Beans (Dry)* | 10-21 fl. oz. per acre. Use lower rate on coarse soils low in organic matter. Apply before planting and incorporate, apply after planting before emergence, or apply after planting when beans have 1-3 trifoliolate leaves. Do not exceed 12 fl. oz. on coarse soils prior to emergence. REI: 12-hour. PHI: 70-day. WSSA 15.

pendimethalin products (pendimethalin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use 3.3EC formulations at 1.2-3.6 pts. per acre. Use 3.8ME formulations at 1.5-3 pts. per acre. Use low rates on coarse soils. Broadcast and incorporate before planting. Not effective on soils with high organic matter. REI: 24-hour. WSSA 3.

Pursuit (2) (imazethapyr) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Southern Peas/Cowpeas* | For **fresh beans in Illinois, Indiana, Iowa, Michigan, and Minnesota only:** apply and 1.5 fl. oz. per acre and incorporate within 1 week of planting, or apply within 1 day after planting. *In Missouri only,* a postemergence application can be mixed with Basagran after crop has at least one true leaf. Apply before July 31. For **dry beans and peas, Lima beans, and Southern peas/cowpeas:** apply 3 fl. oz. per acre and incorporate within 1 week of planting, or apply within 3 days after planting before crop emerges, or apply after crop has 1 fully expanded trifoliolate leaf or peas or cowpeas are at least three inches tall. *Early postemergence application not allowed on lima beans.* Use 8 oz. of NIS per 25 gals. of spray solution if emerged weeds are present. If using COC or N fertilizer on dry beans to improve weed control, add Basagran at 6-16 fl. oz. per acre or Rezult at 12-24 fl. oz. per acre to minimize crop injury. In all cases, do not apply to fields treated with trifluralin or injury may occur. In Minnesota north of Highway 210 and in Michigan on sandy or sandy loam soils do not apply more than 2 fl. oz. per acre. REI: 4-hour. PHI: 30-day for succulent legumes, 60-day for dry legumes. WSSA 2.

Sonalan HFP (35.4) (ethalfluralin) *Beans (Dry)* | 1.5-4.5 pts. per acre. Apply and incorporate before planting. Use higher rates to suppress eastern black nightshade. *Not for muck soils.* REI: 24-hour. WSSA 3.

Spartan Advance (glyphosate, sulfentrazone) *Beans (Dry), Lima Beans, Peas (Dry), Southern Peas/Cowpeas* | 16-57 fl. oz. per acre. Spring-apply early-preplant, preplant-incorporated, or preemergence. Rate depends on soil texture, organic matter, and pH. Do not use on sand soils with less than 1% organic matter or apply after crop emerges. *Michigan, Minnesota, and Wisconsin only:* a fall application is allowed for control of weeds ahead of winter. REI: 12-hour. PHI: 90-day. WSSA 9, WSSA 14.

trifluralin products (trifluralin) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.5-1 lb. a.i. per acre. Use 4E formulations at 1-1.5 pts. per acre for snap beans, lima beans, and peas, or up to 2 pts. per acre for dry beans. Use 10G formulations at 5-7.5 lbs. per acre for snap beans, lima beans, and peas, or up to 10 lbs. per acre for dry beans. Broadcast and incorporate 1-2 inches before seeding. Use low rate on coarse soils with less than 2% organic matter. Not effective on muck or high organic matter soils REI: 12-hour. WSSA 3.

Broadleaf Weeds Only - Postemergence

Pesticide

Aim EC (2) (carfentrazone) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | 0.5-2 fl. oz. per acre. Apply prior to or within 24 hours after seeding, or apply between crop rows with hooded sprayer. Do not allow spray to contact crop. Use COC or NIS. Weeds must be actively growing and less than 4 inches tall. Do not exceed 6.1 fl. oz. per acre per season. REI: 12-hour. WSSA 14.

Legumes - Weeds

Basagran (4) (bentazon) *Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas* | Use Basagran 4L at 1.5 to 2.0 pts. per acre, or Basagran 5L at 1.2-1.6 pts. per acre. Apply when weeds are small and after peas have 3 pairs of leaves or first trifoliolate leaf of beans is fully expanded. Do not add COC for peas. REI: 48-hour. PHI: 30-day. WSSA 6.

Optill (WG) (imazethapyr, saflufenacil) *Peas (Dry), Peas (Fresh)* | For **dry and fresh peas**: apply 1.0-1.5 oz per acre preplant, preplant incorporated or preemergence (up to 3 days after planting before cracking). *In Michigan*: do not apply more than 1 oz. per acre on sand or loamy sand soils preplant burndown or preemergence. *In Minnesota*: do not apply north of Highway 210. For **fresh peas in Illinois, Iowa, and Minnesota**: a sequential application of Sharpen may be made with a minimum of 30 days between applications. In all cases, some varieties may be injured; check with seed supplier. Plant at least 1/2 inch deep to avoid injury. Do not use on any *Phaseolus* bean species. Do not apply group 14 herbicides within 30 days of planting. REI: 12-hour. WSSA 2, WSSA 14.

Sandea (75) (halosulfuron) *Beans (Dry), Beans (Fresh), Lima Beans, Southern Peas/Cowpeas* | 0.5-1 oz. per acre. For **Southern peas/cowpeas**: apply 0.5 oz. per acre after planting but prior to soil cracking. Or use up to 1.0 oz. per acre as a directed postemergence application to the row middles when plants have 2-4 trifoliolate leaves but before flowering. For **Lima beans and fresh beans**: apply 0.5-1.0 oz. per acre after planting but prior to soil cracking. Or, use 0.5-0.67 oz. per acre for postemergence applications over crop and weeds when plants have 2-4 trifoliolate leaves but before flowering, or use up to 1 oz. per acre as a directed postemergence application to row middles with no crop contact. For **dry beans**: apply up to 0.67 oz. per acre after planting but prior to soil cracking. Or, use or as a postemergence application over crop and weeds when plants have 1-3 trifoliolate leaves but before flowering, or use up to 1 oz. per acre as a directed postemergence application to row middles

with no crop contact. Use 0.5-1 pt. of NIS per 25 gals. of spray solution if emerged weeds are present at time of preemergence application. Use lower rates on coarse soils with low organic matter. Not recommended when temperatures are cool due to potential for crop injury. Do not exceed 1 oz. per acre per crop cycle or 2 oz. per acre per 12-month period. REI: 12-hour. PHI: 30-day. WSSA 2.

Sharpen (2.85SC) (saflufenacil) *Peas (Dry), Peas (Fresh)* | For **fresh peas in Illinois, Iowa, Michigan, and Minnesota**: apply 0.75 fl. oz. per acre preplant incorporated or preemergence up to 3 days after planting before cracking. For **lentils in Minnesota**: use up to 2.0 fl. oz. per acre as described for fresh peas. For **dry pea and chickpeas**: apply 1-2 fl. oz. per acre to the surface as a burndown early preplant through preemergence up to 3 days before cracking. Add MSO at 1 pt. per acre when used as a pre-plant burndown. Suppresses black nightshade, lambsquarters, pigweed, and velvetleaf. Higher rates in lentils and chickpeas will provide more, but still limited, residual weed control. Plant legumes at least 1/2-inch deep to avoid injury. Do not apply group 14 herbicides within 30 days of planting. REI: 12-hour. WSSA 14.

Spartan Charge (SE) (carfentrazone, sulfentrazone) *Peas (Dry)* | 3.0-10.2 fl. oz. per acre. For **dry peas and chickpeas**: apply preplant-burndown, early-preplant, or preemergence. Do not use on coarse soils with less than 1% soil organic matter. Rate depends on soil texture, organic matter, and pH. Do not apply after crop emerges. REI: 12-hour. WSSA 14.

Thistrol (2L) (MCPB) *Peas (Dry), Peas (Fresh)* | 1-2 qts. per acre. Controls Canada thistle. Apply when peas have 6-12 nodes. Do not apply later than 3 nodes before pea flowering or after pea flower buds appear. Do not apply when peas are stressed or when temperature exceeds 90 F. REI: 24-hour. WSSA 4.

Broadleaf Weeds Only - Preemergence

Pesticide

Optill (WG) (imazethapyr, saflufenacil) *Peas (Dry), Peas (Fresh)* | For **dry and fresh peas**: apply 1.0-1.5 oz per acre preplant, preplant incorporated or preemergence (up to 3 days after planting before cracking). *In Michigan*: do not apply more than 1 oz. per acre on sand or loamy sand soils preplant burndown or preemergence. *In Minnesota*: do not apply north of Highway 210. For **fresh peas** in *Illinois, Iowa, and Minnesota*: a sequential application of Sharpen may be made with a minimum of 30 days between applications. In all cases, some varieties may be injured; check with seed supplier. Plant at least 1/2 inch deep to avoid injury. Do not use on any *Phaseolus* bean species. Do not apply group 14 herbicides within 30 days of planting. REI: 12-hour. WSSA 2, WSSA 14.

Reflex (2L) (fomesafen) *Beans (Dry), Beans (Fresh), Peas (Fresh)* | For **fresh and dry beans**: Reflex is labeled in all states participating in this publication except in Kansas west of Highway 281 and in Minnesota north of Highway 2. It can be used in extreme southeast Missouri (Region 1) at 1.5 pts. per acre year; Indiana, Illinois, and Ohio south of I-70 (Region 2) at 1.5 pts. per acre in alternate years; Indiana, Illinois, and Ohio north of I-70 (Region 3), and the rest of Missouri at 1.25 pts. per acre in alternate years; Kansas east of Highway 281 and Michigan and Minnesota south of I-94 (Region 4) at 1 pt. per acre in alternate years; and in Minnesota south of Highway 2 and north of I-94 (Region 5) at 0.75 pt. per acre in alternate years. Preplant and preemergence applications are labeled for Regions 1, 2, 3, and 4. Postemergence applications are labeled for Regions 1, 2, 3, 4, and 5. Apply postemergence when dry beans or succulent beans have at least one fully expanded trifoliate leaf, and use NIS, COC, or other additives following label instructions. Do not use liquid nitrogen or ammonium sulfate as an additive. For **overhead irrigated dry beans** in *Kansas (KS 24c exp. 12/31/2022)*: 1 pt. per acre can be applied after

the first fully expanded trifoliate in any county. For **fresh peas** in *Michigan (MI 24c exp. 12/31/23)* and *Minnesota (MN 24c exp. 12/31/20)* only: apply 1 pt. per acre in a tank-mix with other herbicides after seeding peas and before emergence. Use only once in 2 years on same soil. 18-month waiting period before planting most other crops. REI: 24-hour. PHI: 30-day for succulent beans; 45-day for dry beans and succulent peas. WSSA 14.

Sandea (75) (halosulfuron) *Beans (Dry), Beans (Fresh), Lima Beans, Southern Peas/Cowpeas* | 0.5-1 oz. per acre. For **Southern peas/cowpeas**: apply 0.5 oz. per acre after planting but prior to soil cracking. Or use up to 1.0 oz. per acre as a directed postemergence application to the row middles when plants have 2-4 trifoliate leaves but before flowering. For **Lima beans and fresh beans**: apply 0.5-1.0 oz. per acre after planting but prior to soil cracking. Or, use 0.5-0.67 oz. per acre for postemergence applications over crop and weeds when plants have 2-4 trifoliate leaves but before flowering, or use up to 1 oz. per acre as a directed postemergence application to row middles with no crop contact. For **dry beans**: apply up to 0.67 oz. per acre after planting but prior to soil cracking. Or, use or as a postemergence application over crop and weeds when plants have 1-3 trifoliate leaves but before flowering, or use up to 1 oz. per acre as a directed postemergence application to row middles with no crop contact. Use 0.5-1 pt. of NIS per 25 gals. of spray solution if emerged weeds are present at time of preemergence application. Use lower rates on coarse soils with low organic matter. Not recommended when temperatures are cool due to potential for crop injury. Do not exceed 1 oz. per acre per crop cycle or 2 oz. per acre per 12-month period. REI: 12-hour. PHI: 30-day. WSSA 2.

Sharpen (2.85SC) (saflufenacil) *Peas (Dry), Peas (Fresh)* | For **fresh peas** in *Illinois, Iowa, Michigan, and Minnesota*: apply 0.75 fl. oz. per acre preplant incorporated or preemergence up to 3 days after planting before cracking. For **lentils** in *Minnesota*: use up to 2.0 fl. oz. per acre as described for fresh peas. For **dry pea and chickpeas**: apply 1-2 fl. oz.

Mint - Horticulture

per acre to the surface as a burndown early preplant through preemergence up to 3 days before cracking. Add MSO at 1 pt. per acre when used as a pre-plant burndown. Suppresses black nightshade, lambsquarters, pigweed, and velvetleaf. Higher rates in lentils and chickpeas will provide more, but still limited, residual weed control. Plant legumes at least 1/2-inch deep to avoid injury. Do not apply group 14 herbicides within 30 days of planting. REI: 12-hour. WSSA 14.

Spartan 4F (sulfentrazone) Peas (Dry) | 2.25-8.0 fl. oz. per acre. Spring-apply early-preplant, preplant-incorporated, or preemergence up to 3 days after planting before cracking. Rate depends on soil texture, organic matter, and pH. Do not use on sand soils with less than 1% organic matter or apply after crop emerges. *Michigan, Minnesota, and Wisconsin only*: a fall application before soil freezes is allowed. REI: 12-hour. WSSA 14.

Spartan Charge (SE) (carfentrazone, sulfentrazone) Peas (Dry) | 3.0-10.2 fl. oz. per acre. **For dry peas and chickpeas**: apply preplant-burndown, early-preplant, or preemergence. Do not use on coarse soils with less than 1% soil organic matter. Rate depends on soil texture, organic matter, and pH. Do not apply after crop emerges. REI: 12-hour. WSSA 14.

Grass Weeds Only - Postemergence

Pesticide

Assure II (10.3EC) (quizalofop) Beans (Dry), Beans (Fresh), Peas (Dry), Peas (Fresh) | 5-12 fl. oz. per acre. Use 1 qt. of COC per acre. Apply to actively growing grass. Do not exceed 14 fl. oz. per acre. REI: 12-hour. PHI: 15-day for succulent beans; 30-day for dry beans and succulent peas; 60-day for dry peas. WSSA 1.

clethodim products (clethodim) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | Use 2EC formulations at 6-16 fl. oz. per acre with 1 qt. of

COC per 25 gals. of spray solution (1% v/v). Use Select Max at 9-32 fl. oz. per acre with 8 fl. oz. of NIS per 25 gals. of spray solution (0.25% v/v). Use low rates for annual grasses, the high rates for perennial grasses. Spray on actively growing grass. Wait at least 14 days between applications. Do not exceed 32 fl. oz. of 2EC formulations per acre per season. Do not exceed 64 fl. oz. of Select Max per acre per season. REI: 24-hour. PHI: 21-day for succulent legumes, 30-day for dry legumes. WSSA 1.

Fusilade DX (2EC) (fluazifop-P) Beans (Dry) | 8-12 fl. oz. per acre. Include 1-2 pts. of COC or 0.5-1 pt. of NIS per 25 gals. of spray solution. Spray on actively growing grass. Wait at least 14 days between applications. Do not exceed 48 fl. oz. per acre per season. REI: 12-hour. PHI: 60-day. WSSA 1.

Poast (1.5EC) (sethoxydim) Beans (Dry), Beans (Fresh), Lima Beans, Peas (Dry), Peas (Fresh), Southern Peas/Cowpeas | 1-2.5 pts. per acre. Use 1 qt. of COC per acre. Spray on actively growing grass. Use high rate on quackgrass. Do not exceed 4 pts. per acre per season. REI: 12-hour. PHI: 15-day for succulent legumes, 30-day for dry legumes. WSSA 1.

Mint - Horticulture

Reviewed by Ben Phillips, Liz Maynard – Oct 2020

Crop Description

Mints are a group of perennial herbs that are commercially important as sources of essential oils obtained by distillation of their hay. The discussion in this section refers to production for 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.