

Beans: Snap, Dry and Lima

Culture

Snap Beans

Snap beans also are known as green beans and include wax (yellow), podded and pole beans. Most commercial beans in Ohio are produced on bush-type plants. Pods are flat, oval or round, depending on variety. Pole beans are grown in hills around a pole or on a trellis. Good commercial yields for fresh market are 150+ bu/A.

Beans thrive on well-drained loam-type soils. They do not grow well on wet soils. Planting should begin only when soil temperatures have reached 55-60°F, unless planting for an early market. Optimum seed germination temperatures occur at 70°F and higher.

Irrigation is necessary at the time of bloom in order to ensure maximum pod set under dry soil conditions. Temperatures above 90°F or below 50°F cause poor pod set.

Good commercial yields are 200+ bu/A for fresh market and 4 ton/A for processing.

Dry Beans

The most popular types are the pea beans and the light red kidney types. It is important to obtain western-grown, certified disease-free seed, because seedborne diseases such as “halo blight” and anthracnose commonly are introduced on infested seedlots. A good yield is 2,200 lb/A.

Lima Beans

Lima beans are of minor importance in Ohio. However, there now is increased interest for roadside stands. Limas grow best in coastal regions of the United States. Seed germination is poor in cool soils (below 60°F). A good yield of shelled beans is 3,000 lb/A.

Varieties

Snap beans

Main Season	Bronco	Hialeah
	Matador	Gold mine
	Opus	Goldkist
	Eagle	Goldrush (wax)
	Derby	Goldcrop (wax)
	Strike	Klondyke (wax)

Processing

Bush Blue Lake 47
Early Gallaitin
Bush Blue Lake 92
Bush Romano (Romano type)

Dry Beans

White Marrow
Pinto
California Light Red Kidney
Redcloud Kidney

Lima Beans

Fordhook 242
Fordhook 1072

Lime and Fertilizer

Maintain soil pH at 6.0-7.0.

Apply 20-40 lb N/A. Apply P_2O_5 and K_2O according to soil test. Nitrogen amounts less than 20-40 lb/A may be desirable if beans are mechanically harvested (which reduces the amount of leaves). Adjust to soil test or prior experience with a given harvesting system. Apply in band 2 inches below and 2 inches to the side of the seed. Keep fertilizer away from the seed, and do not band more than 80-100 lb P_2O_5 plus K_2O .

Sidedress with additional nitrogen if needed. Excess nitrogen prevents concentrated fruit-set and causes more vine growth.

Spacing and Seeding

Snap beans

Plants should be spaced 1.5-2.0 inches within rows and 30-36 inches between rows. Multirow harvesters can plant on 18- to 20-inch rows with 3-4 plants/ft of row, use 50% more fertilizer. Some white seeded varieties should be planted in warmer soils.

Use higher plant populations (up to 95,000 plants/A) under a favorable environment. Sow 75-120 lb of seed/A, depending on seed type and percent germination. Planting depth is 1-2 inches, depending on soil type and moisture.

Lima beans

Plants should be spaced 3-4 inches within rows and 30-36 inches between rows. Use 40-60 lb of seed/A. Plant 1 inch deep in moist, heavy soils and 2 inches deep in dry, sandy soils.

Dry beans

Plants should be spaced 2-3 inches within rows and 28-36 inches between rows. Amount of seed required depends on type—about 75-100 lb/A for marrow and kidney types. Contact seed companies for specific recommendations.

Harvest

Dry beans

Dry beans should not be harvested until they are thoroughly matured. Let pods mature on the plants, but harvest before the pods dry to the point of shattering. The mature beans should be so hard that seeds cannot be easily bitten.

Disease Control

Damping Off

Buy seed commercially treated with Apron Maxx or Thiram to reduce the incidence of damping-off caused by Phytophthora, Pythium, Rhizoctonia, and Fusarium. If Pythium and Rhizoctonia are a significant problem, apply **Ridomil Gold PC GR** at 0.75 lb/1,000 ft of row at planting. See label directions. **Maxim 4FS** may be applied at 0.08-0.16 fl oz/100 lb seed to control Rhizoctonia and Fusarium.

Bacterial Blights

Plant western-grown, certified disease-free seed. Practice a 2-year rotation and plow under bean stubble in the fall. Spray with a fixed copper (e.g., Kocide, Champ, Cuprofix) at 5-7 day intervals to reduce spread (0 days-PHI) if weather conditions (rainy) favor disease.

Anthracnose

Plant disease-free seed. Spray one of the following fungicides at 7-day intervals:

Bravo WeatherStik 1.4-2 pt/A (dry beans only, 6 wks)

***Topsin M 70 WP** or **70 WSB** 1-1.5 lb/A beginning when 10-30% of plants have at least one open bloom (14 days-PHI [snap, dry]; 28 days-PHI [lima]).

Equus 720 1.4-2 lb/A (7 days-PHI).

Maneb 75 DF or **80 WP**, 1.5-2.0 pt/A (dry beans only, 30 days-PHI).

Manex 1.2-1.6 qt/A (dry beans only, 30 days-PHI).

***Quadris** 2-5 oz/A (0 days-PHI).

Rust

Spray at 4- to 7-day intervals as needed, starting at first signs of disease with one of the following:

Bravo Ultrex 1.25-2.7 lb/A (7 days-PHI).

Quadris Opti 1.6-2.4 pt/A (dry beans only, 14 days-PHI).

Bravo Weather Stik 1.4-3 pt/A (snap, 7 days-PHI).

Equus 720 1.4-3 pt/A (snap), 1.4-2 pt/A (dry) (14 days-PHI).

Maneb 75 DF or **80 WP**, 1.5-2.0 pt/A (dry beans only, 30 days-PHI).

Manex 1.2-1.6 qt/A (dry beans only, 30 days-PHI).

TopCop S 6F 0.2-1.75 pt/A (0 days-PHI).

***Nova** 40W 4.0-5.0 oz/A. 7-day spray interval. (0 days-PHI).

Sclerotinia White Mold and Botrytis Gray Mold

Plant on well-drained soil not recently planted to beans, potatoes, peppers, tomatoes, lettuce or cabbage. Orient rows in an east to west direction (parallel to prevailing winds) and use wide spacing (36 in) to reduce moisture in the canopy. Avoid planting in shaded fields, fields bordered on two or more sides by trees or fields that drain poorly. For management of white mold, fungicide sprays should be used when the soil has been wet for 6-10 days before bloom or during bloom. Rovral has been inconsistent in managing white mold but should be used in combination with Topsin M for gray mold control. Spray beans beginning at first bloom as follows:

Topsin M 70 W or 70 WSB White Mold: 1.0-1.5 lb/A at 4-7 day intervals beginning when 10-30% of plants have one open bloom (snap, 14 days-PHI; lima, 28 days-PHI).

Rovral 4 F 1.5-2.0 lb/A (0 days-PHI), maximum two applications per season.

Botran 75-W 4 lb/A (snap beans only); 4 lb/A pole beans (2 days-PHI) at 7-day intervals.

Contans WG 2-4 lb/A (in 50-100 gal water). This is a biological fungicide that has shown promise in some states. Apply immediately after harvest of beans or other hosts of white mold. Alternatively, apply 3-4 months before planting beans. See label for details.

***Endura** 8-11 oz/A (dry, 21 days-PHI; snap and lima, 7 days-PHI), maximum two applications per season.

***Switch 62.5 WG** 11-14 oz/A, repeat at 7-day intervals. Maximum two applications before switching to a fungicide with a different mode of action. A single application at 10-20% bloom may provide adequate control of white mold in some locations.

For Botrytis only, apply one of the following:

Bravo Ultrex (snap beans only) 2.7 lb/A, 7 days-PHI.

Equus 720 3 pt/A (7 days-PHI), repeat at 7-day intervals.

Bean Yellow Mosaic Virus (BYMV)

No adequate control method is known. Eliminating overwintering host plants, such as wild sweet clover, from nearby bean fields may reduce infection. Some tolerant cultivars are available.

*Follow guidelines for fungicide resistance management on the product label (see pages 59-60).

Insect Control

See the table on the next page for overview of insecticides used to control bean pests.

Note on edamame soybeans: Edamame soybeans are not the same as either snap beans or dry soybeans, in terms of pesticides allowed. In the crop grouping scheme used by EPA, legume vegetables are in crop group 6 and in three sub-groups within group 6. Sub-group 6A includes succulent edible-podded crops such as snap beans, snow peas, and "soybean (immature seed)", which is edamame. Sub-group 6B includes succulent shelled crops such as lima beans and garden peas. Sub-group 6C included dried shelled beans. Regular dry soybeans are in group 6 but not in any of the subgroups. Many recently registered pesticides include whole groups or sub-groups, while many of the older pesticides are registered for use on just a specific crop (such as snap bean), without the entire crop group. Insecticides that can be used on edamame are: Admire, BT, Capture, Di-Syston, Hero, Intrepid, Mustang, Proaxis, Provado, Sevin, Thiodan, Warrior.

Insecticides for Use on Beans in Ohio

(E = excellent; G = good; F = fair; P = poor; ✓ = pest listed on label but efficacy uncertain; - = pest not on label; rating in parentheses = pest not on label but product known to provide some control)

Pest >>	Pre-harvest interval (days)	Soil pests	Potato leafhopper	Bean leaf beetle	Mexican bean beetle	Spider mites	European corn borer	Aphids	Impact on beneficial insects
<i>How often an insecticide has been needed on Ohio farms for this pest in the past>></i>		occasional	most years	most years	most years in some locations, rare in other locations	occasional	rare	rare	
ORGANOPHOSPHATES									
Dibrom (naled)	1	-	✓	-	-	✓	-	✓	moderate/disruptive
dimethoate (Cygon)	0	-	G	G	✓	G	-	G	disruptive
Di-Syston (disulfoton)	60	-	✓	-	✓	✓	-	G	moderate
malathion (Cythion)	1	-	F	-	✓	F	-	F	low/moderate
Mocap (ethoprop)	-	✓	-	-	-	-	-	-	moderate
Orthene (acephate)	7, 30	-	✓	F	✓	-	✓	G	moderate/disruptive
Penncap-M (methyl parathion)	15	-	F	-	✓	-	✓	F	disruptive
Thimet (phorate)	-	✓	G	-	✓	✓	-	P	moderate
CARBAMATES									
Lannate (methomyl)	1, 3, 14	-	G	(G)	✓	-	✓	G	disruptive
Sevin (carbaryl)	3, 21	-	G	G	✓	-	✓	-	disruptive
Temik (aldicarb)	90	-	✓	-	✓	✓	-	✓	moderate
PYRETHROIDS									
Asana (esfenvalerate)	3, 21	-	G	(G)	✓	-	✓	F	disruptive
Capture, Brigade (bifenthrin)	3	✓	G	G	✓	F	✓	F	disruptive
Hero (bifenthrin + z.c.)	3	-	G	G	✓	F	✓	F	disruptive
Mustang (zeta-cypermethrin)	1	-	G	G	✓	-	✓	-	disruptive
Proaxis (gamma-cyhalothrin)	7	-	G	G	✓	✓	✓	✓	disruptive
Warrior (lambda cyhalothrin)	7	-	G	G	✓	-	✓	-	disruptive
OTHER INSECT NERVE POISONS									
Admire (imidacloprid)	21	-	-	-	-	-	-	G	low/moderate
Cruiser (thiamethoxam)	-	✓	✓	✓	-	-	-	✓	low/moderate
Provado (imidacloprid)	7	-	G	-	-	-	-	G	low/moderate
Pyronyl, PyGanic (pyrethrins)	0	-	✓	✓	✓	✓	✓	✓	moderate
Radiant (spinetoram)	3, 28	-	-	-	-	-	✓	-	
SpinTor (spinosad)	3	-	-	-	-	-	✓	-	low
Thionex (endosulfan)	3	-	F	-	✓	-	-	G	moderate
INSECT GROWTH REGULATORS									
Courier (buprofezin)	14	-	-	-	-	-	-	-	low/moderate
Intrepid (methoxyfenozide)	7	-	-	-	-	-	✓	-	low/moderate
Neemix, Aza-Direct (azadirachtin)	0	-	-	✓	✓	-	-	-	low/moderate
Trigard (cyromazine)	7	-	-	-	-	-	-	-	low/moderate
MISCELLANEOUS									
<i>Bacillus thuringiensis</i> (B.t.)	0	-	-	-	-	-	✓	-	very low
Kelthane (dicofol)	21	-	-	-	-	G	-	-	low/moderate
soap (M-Pede)	0	-	F	-	-	F	-	F	low

• Commercial seed treatment

Imidacloprid

Gaucha 480: 2-4 fl oz per cwt for wireworm, bean leaf beetle, aphids.

Thiamethoxam

For wireworm, seedcorn maggot, bean leaf beetle, aphids, and plant leafhopper.

Cruiser 5FS: 1.28 fl oz per 100 lbs seed.

• Preplant broadcast treatment

Ethoprop (snap and lima beans)

For garden symphylan, nematodes.

Apply from 3 days before planting to at-planting.

Mocap 6EC: 1-1.3 gal/A.

Mocap 15G: 40-54 lb/A.

• At-planting treatment

Aldicarb (dry beans only; 90-day PHI)

For aphids, leafhoppers, mites, Mexican bean beetle, nematodes.

Temik 15G: 5.5-7.5 oz/1,000 ft for aphids; 7.5-15 oz/1,000 ft for other pests. Limit 14 lb/A per year.

Bifenthrin (3 days-PHI)

For maggot, wireworm, grubs.

Brigade 10WSB: 8-16 oz/A. Apply in-furrow with seed.

Disulfoton (snap, lima, and dry beans)

For aphids, leafhoppers, mites, Mexican bean beetle.

Limit 1 application per year. Do not apply directly on the seed.

Di-Syston 15G: 6-12 oz/1,000 ft.

Di-Syston 8EC: 0.9-1.9 oz/1,000 ft.

Ethoprop (snap and lima beans)

For garden symphylan and nematodes.

Do not allow granules to contact seed.

Mocap 6EC: 2-4.4 fl oz/1,000 ft (1.33-2 qt/A for 36-inch rows).

Mocap 15G: 0.9-1.4 lb/1,000 ft (13-20 lb/A for 36-inch rows).

Imidacloprid (21 days-PHI)

For aphids, leafhoppers, thrips, whiteflies.

Admire 2F, Alias 2F: 16-24 oz/A.

Admire Pro (4.6F): 7.0-10.5 fl oz/A.

Phorate

For seedcorn maggot, aphids, leafhoppers, mites, Mexican bean beetle.

Thimet 20G; Phorate 20G: 4.5-9.4 oz/1,000 ft for Mexican bean beetle; 4.5-7 oz/1,000 ft for other pests.

• Sidedress treatment

Disulfoton (60 days-PHI, dry beans only)

For aphids, leafhoppers, mites, Mexican bean beetle.

Limit 1 application per year.

Di-Syston 15G: 6-12 oz/1,000 ft.

Di-Syston 8EC: 0.9-1.9 oz/1,000 ft.

• Bait treatment

Metaldehyde (0 days-PHI)

For slugs.

Deadline MP (4B): 20-40 lb/A.

Prozap Snail and Slug AG (3.5B): 24-40 lb/A.

Metaldehyde 7.5G: 20 lb/A.

• Foliar treatment

Acephate (14 days-PHI, snap and dry beans; 0 days-PHI, lima beans)

Orthene 75SP: 0.7-1.3 lb/A for aphids, bean leaf beetle, leafhoppers, Mexican bean beetle; 1-1.3 lb/A for European corn borer. Limit 2.7 lb/A per season.

Orthene 97: 4-16 oz/A. Limit 2.12 lb/A per season.

Bracket 90S: 0.25-1.1 lb/A.

Bifenthrin (3 days-PHI)

Brigade 2EC, Capture 2EC, Discipline 2EC, Fanfare 2EC, Sniper 2EC, Tundra 2EC: 1.6-6.4 fl oz/A for leafhoppers; 2.1-6.4 fl oz/A for bean leaf beetle, corn borer, aphids; 5.12-6.4 fl oz/A for mites.

Brigade 10WSP: 4-16 oz/A.

Bifenthrin + zeta-cypermethrin (3 days-PHI)

For bean leaf beetle, Mexican bean beetle, leafhoppers, spider mites, aphids, European corn borer.

Hero 1.24EC: 4-10.3 fl oz/A.

Buprofezin (14 days-PHI)

For whiteflies.

Courier (70W): 8.7 oz/A.

Carbaryl (3 days-PHI, snap; 21 days-PHI, dry)

For leafhoppers, bean leaf beetle, European corn borer, Mexican bean beetle.

Carbaryl 90DF: 0.6-1.6 lb/A.

Carbaryl 4L; Sevin 4F; Sevin XLR Plus (4EC): 1 qt/A for leafhoppers; 1-1.5 qt/A for European corn borer; 0.5-1 qt/A for bean leaf beetle, Mexican bean beetle.

Sevin 80S: 1.25 lb/A for leafhoppers; 1.25-1.88 lb/A for European corn borer; 0.67-1.25 lb/A for bean leaf beetle, Mexican bean beetle.

Sevin 50WP: 2 lb/A for leafhoppers, bean leaf beetle; 2-3 lb/A for European corn borer; 1-2 lb/A for Mexican bean beetle.

Cyromazine (7 days-PHI, lima beans only)

For leafminers.

Trigard 75WP: 0.17 lb/A.

Dicofol (21 days-PHI)

For spider mites.

Dicofol 4EC: 1-3 pt/A.

Kelthane MF (4EC): 1-3 pt/A.

Dimethoate (0 days-PHI)

For aphids, leafhoppers, mites, bean leaf beetle, Mexican bean beetle.

Dimethoate 4EC: 0.5-1 pt/A.

Dimethoate 2.67EC: 0.75-1.5 pt/A.

Endosulfan (3 days-PHI, snap and dry beans)

For Mexican bean beetle, leafhoppers, aphids.

Limit 3 applications per year or 4 qt/A per year.

Thionex 3EC, Endosulfan 3EC: 0.67-1.33 qt/A.

Thionex 50WP: 1-2 lb/A.

Esfenvalerate (3 days-PHI, snap beans; 21 days-PHI, dry beans)

For leafhoppers, Mexican bean beetle, European corn borer.

Asana XL 0.66EC, Adjourn 0.66EC: 5.8-9.6 fl oz/A for leafhopper, borer; 2.9-5.8 fl oz/A for Mexican bean beetle. Limit 39 fl oz/A per season.

Gamma-cyhalothrin (7 days-PHI)

For leafhoppers, bean leaf beetle, Mexican bean beetle; suppression of spider mites.

Proaxis (0.5EC): 1.92-3.84 fl oz/A.

Imidacloprid (7 days-PHI)

For aphids, leafhoppers, whiteflies.

Provado 1.6F, Pasada 1.6F: 3.5 fl oz/A. Limit 10.5 fl oz/A per year.

Lambda-cyhalothrin (7 days-PHI)

For beetles, leafhoppers, caterpillars.

Warrior 1EC, Silencer 1EC, Taiga Z 1CS: 1.92-3.84 fl oz/A.

Malathion (1 day-PHI)

For leafhoppers, Mexican bean beetle, aphids, mites.

Malathion 5EC: 1.5-2.5 pt/A for leafhoppers, Mexican bean beetle; 2-2.5 pt/A for aphids.

Malathion 8EC: 1-1.5 pt/A.

Malathion 8 Aquamul: 1.25-1.75 pt/A.

Cythion 9.3EC: 8 oz/A.

Methomyl (1 or 3 days-PHI, snap beans, depending on rate; 14 days-PHI, dry beans)

For leafhoppers, Mexican bean beetle, aphids, European corn borer.

Limit 10 applications/crop.

Lannate 90SP: 0.25-1 lb/A for leafhoppers, Mexican bean beetle; 0.5-1 lb/A for aphids, European corn borer.

Lannate LV (2.4EC): 0.75-3 pt/A for leafhoppers, Mexican bean beetle; 1.5-3 pt/A for aphids, European corn borer.

Methoxyfenozide (7 days-PHI)

For caterpillars.

Intrepid 2F: 4-8 fl oz/A for young plants or light infestations; 8-16 fl oz/A for larger plants or heavy infestations. Limit 64 fl oz per acre per season.

Methyl parathion (15 days-PHI, dry beans only)

For aphids, leafhoppers, Mexican bean beetle, European corn borer.

Do not apply to blooming crops or weeds when bees are foraging.

PennCap-M (encapsulated 2F): 2 pt/A for aphids, leafhoppers, Mexican bean beetle; 2-4 pt/A for European corn borer.

Limit 12 pt/A per season.

Naled (1 day-PHI, snap, lima, and dry beans)

For aphids, leafhoppers, mites.

Dibrom 8EC: 1-1.5 pt/A.

Pyriproxyfen (7 days-PHI)

For whiteflies.

Esteem 35WP: 2.5-3 oz/A. Limit 2 applications or 6 oz/A per season.

Spinetoram (3 days-PHI, snap beans; 28 days, dry beans)

For European corn borer.

Radiant 1SC: 3-8 fl oz/A. Limit 6 applications per crop.

Spinosad (3 days-PHI, succulent; 28 days-PHI, dried)

SpinTor 2SC: 3-6 fl oz/A for European corn borer; 4-6 fl oz/A for armyworms, corn earworm, loopers; 6 fl oz/A for leafminers, thrips. Limit 29 fl oz/A per year.

Entrust (80WP): 1-2 oz/A.

Zeta-cypermethrin (1 day-PHI)

For leafhoppers, beetles, caterpillars.

Mustang 1.5EW: 3.0-4.3 fl oz/A.

Mustang Max (0.8EC): 1.28-4.0 fl oz/A.

Weed Control

Preplant Incorporated

Alachlor: Controls germinating annual grasses, some broadleaf weeds and yellow nutsedge. Do not use on red kidney beans.

Lasso 4EC and Micro-Tech: 2.5-3 qt/A.

Partner WDG: 3.8-4.5 lb/A.

Frontier 6.0 (dimethenamid) controls emerging annual grasses, some broadleaf weeds and yellow nutsedge. For use on dry beans only. Apply 1-2 pt/A.

Trifluralin: Controls germinating annual grasses and some broadleaf weeds. Incorporate once within 24 hours of application and again before planting.

Dry Beans

Albaugh Trifluralin, Gowan Trifluralin 4, Riverside Trifluralin 4EC, Tri-4 HF, Trilin 4EC, Treflan HFP: 1-2 pt/A.

Gowan Trifluralin 5EC, Trilin 5EC: 0.8-1.6 pt/A.

Riverside Trific 60DF: 0.875-1.66 lb/A.

Gowan 10G, Treflan TR-10, Trilin 10G, Wilbur-Ellis Trifluralin 10G: 5-10 lb/A.

Lima and Snap Beans

Albaugh Trifluralin, Gowan Trifluralin 4, Riverside Trifluralin 4EC, Tri-4 HF Trilin 4EC, Treflan HFP: 1-1.5 pt/A.

Gowan Trifluralin 5EC, Trilin 5EC: 0.8-1.2 pt/A.

Riverside Trific 60DF: 0.875-1.33 lb/A.

Gowan 10G, Treflan TR-10, Trilin 10G, Wilbur-Ellis Trifluralin 10G: 5-7.5 lb/A.

Dry Beans and Green Beans

Eptam 7-E controls germinating annual grasses and some broadleaf weeds. Incorporate immediately after planting. Do not use on adzuki beans, lima beans and other flat podded beans except Romano. Use 3.5-4.5 pt/A.

Metolachlor/s-metolachlor: Controls germinating annual grasses, yellow nutsedge and some broadleaf weeds. Incorporate into the top 2 inches of soil within 14 days of planting.

Dual 8E and Dual II: 1.5-3 pt/A.

Dual Magnum: 1-2 pt/A.

Pendimethalin: Controls germinating annual grasses and some broadleaf weeds. Use on dry beans, lima beans and snap beans.

Prowl 3.3EC: 1.2-3.6 pt/A.

Pentagon DG: 0.5-2.5 lb/A.

Preemergence

Command 3ME: Green beans. Controls annual grasses and suppresses some broadleaf weeds. Apply 0.4-0.67 pts/A after seeding but before crop emergence.

Frontier 6.0: Controls emerging annual grasses, some broadleaf weeds and yellow nutsedge. For use on dry beans only. Use 1-2 pt/A.

Metolachlor/s-metolachlor: Controls germinating annual grasses, yellow nutsedge and some broadleaf weeds. Incorporate into the top 2 inches of soil within 14 days of planting.

Dual 8E and Dual II: 1.5-3 pt/A.

Dual Magnum: 1-2 pt/A.

Dacthal 75W controls germinating annual grasses and broadleaf weeds. Apply at seeding. Rainfall, irrigation, or light incorporation improves weed control. Use 8-10.6 lb/A.

Sandea: For control of broadleaf weeds, apply a single application of 0.5-1.0 oz/A (0.66 oz/A maximum to dry beans) after seeding but before ground crack. Apply only once per crop cycle and do not exceed 2 oz/A in a 12 month period.

Postemergence

Assure/Targa: Dry- and snap beans. Controls annual and perennial grass weeds. Apply 5-10 oz/A depending on annual grass species and size. Apply 10-12 oz/A for quackgrass or johnsongrass. Always use a crop oil concentrate or non-ionic-surfactant. Snap bean (15 days-PHI). Dry bean (30 days-PHI).

Basagran: Controls emerged annual broadleaf weeds and yellow nutsedge. Control depends on timing application to coincide with susceptible growth stage of various weeds. Use 1-2 pt/A. For lima beans, delay application until the crop is 6 to 8 inches high. For other beans, apply after the crop has at least the first trifoliolate leaf fully expanded. May cause bronzing, temporary stunting and delayed maturity on some bean types, especially when weather is hot and humid. Delaying application until the 2 trifoliolate leaf stage has fully expanded will minimize injury (30 days-PHI on green succulent beans).

Frontier 6.0: Controls emerging annual grasses, some broadleaf weeds and yellow nutsedge. For use on dry beans only. Apply during the 1 to 3 trifoliolate stage of the crop before weed emergence. Use 1-2 pt/A.

Poast: Controls emerged annual and perennial grasses. Use 1-2.5 pt/A plus 2 pt/A of crop oil concentrate. Maximum use rate per season is a total of 4 pt/A/season (30 days-PHI on dry beans; 15 days-PHI on succulent beans).

Pursuit: Dry and succulent beans including garbanzo, kidney and white beans. Controls annual broadleaf weeds and grasses. Apply a maximum of 4 oz/A when bean crops have at least 1 trifoliolate leaf. Use only non-ionic-surfactant. Crop maturity may be delayed. Succulent bean (30 days-PHI). Dry bean (60 days-PHI).

Reflex: Dry beans and snap beans. Controls annual broadleaf weeds and suppresses some grasses. Apply 1.25-1.5 pts/A depending on location within Ohio (see Reflex product label). For information on required adjuvant, see the Reflex product label. Do not use liquid nitrogen as an adjuvant in Reflex applications to edible beans. Delay application until dry beans have at least 4 fully expanded trifoliolate leaves and snap beans have at least one fully expanded trifoliolate leaf. Do not use Reflex more than once every two years. Dry beans (45 days-PHI). Snap beans (30 days-PHI).

SelectMax: For control of annual or perennial grasses in dry and succulent beans. 9-16 fl oz/A can be applied to succulent beans and up to 32 fl oz/A can be applied to dry beans. Non-ionic surfactant is required at 0.25% of final volume. Repeat applications can be made at 14-day intervals for maximum allowed use per season of 64 fl oz/A. Pre-harvest interval is 21 days for succulent beans and 30 days for dry beans.