

FIELD PEA

CUTWORMS

Cutworms are an occasional problem in field pea. Cutworms overwinter as eggs or young larvae that feed on the newly emerged shoots in spring. The shoots may be cut off below the soil surface. Cotyledons (seeds) of pea often remain below the soil surface and can recover from cutworm damage if cool, moist growing conditions. However, recovered plants are generally set back 4 to 7 days by the damage.

Threshold:

The risk is low, unless more than 2 to 3 cutworms per square yard occur in the top 3 inches of soil.

Insecticides approved for use on cutworms in Field Pea

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
beta-cyfluthrin Baythroid XL <i>RUP</i>	0.007 - 0.013	0.8 - 1.6 fl oz	PHI = 7 days. Maximum of 6.4 fl oz per acre per season. Maximum of 3.2 fl oz per acre between 14-day interval. Minimum application volume is 10 GPA by ground and 5 GPA by air. Do not feed treated vines or hay to livestock.
bifenthrin Brigade 2EC Fanfare 2 EC Sniper <i>RUP</i>	0.033 - 0.10	2.1 - 6.4 fl oz	PHI = 14 days. Apply in a minimum of 2 GPA by air or 10 GPA for ground application. Do not apply more than 0.2 lb ai (12.8 fl oz) to field pea per acre per season. Do not make applications less than 7 days apart.
bifenthrin Capture LFR <i>RUP</i>	0.04 - 0.08 (0.0023 - 0.0046 lb/1000 linear feet)	3.4 - 6.8 fl oz (0.20 - 0.39 fl oz/ 1000 linear feet)	See label for soil application directions. Do not apply more than 0.2 lb ai (12.8 fl oz) bifenthrin to field pea per acre per season. Do not apply more than 0.1 lb ai per acre per season as an at-plant application.
carbaryl Sevin 4F	1.0 - 1.5	32 - 48 fl oz	Do not apply within 14 days of grazing or harvest for forage use or within 3 days of harvest of fresh peas or within 21 days of harvest of dried peas, seed, or hay. Most effective against cutworm species that feed on the upper parts of the plant. Apply as necessary up to a total of 4 applications but not more than once every 7 days.
cyfluthrin Tombstone Tombstone Helios <i>RUP</i>	0.013 - 0.025	0.8 - 1.6 fl oz	PHI = 7 days. Maximum of 6.4 fl oz per acre per season. Maximum of 3.2 fl oz per acre per 14-day interval. Minimum application volume is 10 GPA by ground and 5 GPA by air. Do not feed treated vines or hay to livestock.
esfenvalerate Adjourn Asana XL <i>RUP</i>	0.03 - 0.05	5.8 - 9.6 fl oz	PHI = 21 days. Do not apply more than 0.2 lb ai/acre per season. Do not feed or graze livestock on treated fields. Apply with a minimum of 2 GPA for air and 10 GPA for ground applications.
gamma-cyhalothrin Proaxis <i>RUP</i>	0.01 - 0.015	2.56 - 3.84 fl oz	PHI = 21 days. Do not apply more than 0.06 lb ai (0.96 pt) per acre per season. Do not graze livestock in treated areas or harvest vines for forage or hay.
lambda-cyhalothrin Lambda-Cy Silencer Grizzly Z <i>RUP</i>	0.015 - 0.025	1.92 - 3.2 fl oz	PHI = 21 days. Do not graze livestock in treated area or harvest vines for forage or hay. Do not apply more than 0.12 lb ai per acre per season.
lambda-cyhalothrin Kaiso 24 WG <i>RUP</i>	0.015 - 0.025	1.0 - 1.67 oz	
lambda-cyhalothrin Warrior II <i>RUP</i>	0.015 - 0.025	0.96 - 1.60 fl oz	PHI = 21 days for dried shelled legumes. Do not apply more than 0.12 lb ai (7.68 fl oz) per acre per season. Do not graze livestock in treated area or harvest vines for forage or hay.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
methomyl Lannate LV <i>RUP</i>	0.45 - 0.9	1.5 - 3 pts	PHI = 1 day. Do not apply more than 9 pts per acre per season. Do not make more than 6 applications per season per field. Minimum interval between treatments is 3 days.
zeta-cypermethrin Mustang Max Mustang Max EC Respect <i>RUP</i>	0.008 - 0.025	1.28 - 4 fl oz	PHI = 21 days. Do not apply more than 0.15 lb AI per acre per season including at-planting plus foliar applications. Do not make applications less than 5 days apart. Apply by air or by ground using sufficient water to obtain full coverage. Use a minimum of 2 gals per acre by air and 10 gals per acre by ground.

RUP - Restricted use pesticide

GRASSHOPPERS

Grasshoppers are usually not a major problem in pea. Pea is not typically a preferred host, but grasshoppers can cause damage to field pea, especially during the flower to pod-filling stages.

Grasshopper Thresholds: Infestation Ratings: The threatening rating is considered the action threshold for grasshoppers. Since it is difficult to estimate the number of grasshoppers per square yard when population densities are high, pest managers can use four 180-degree sweeps with a 15-inch sweep net, which is equivalent to the number of adult (or nymph) grasshoppers per square yard.

Rating	Nymphs (young hoppers) per square yard		Adults per square yard	
	Margin	Field	Margin	Field
Light	25-35	15-23	10-20	3-7
Threatening	50-75	30-45	21-40	8-14
Severe	100-150	60-90	41-80	15-28
Very Severe	200+	120	80+	28+

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
beta-cyfluthrin Baythroid XL <i>RUP</i>	0.019 - 0.025	2.4 - 3.2 fl oz	PHI = 7 days. Maximum of 6.4fl oz per acre per season. Maximum of 3.2 fl oz per acre between 14-day interval. Minimum application volume is 10 GPA by ground and 2 GPA by air. Do not feed treated vines or hay to livestock.
bifenthrin Brigade 2EC Fanfare 2EC Sniper <i>RUP</i>	0.025 - 0.10	1.6 - 6.4 fl oz	PHI = 14 days. Apply in a minimum of 2 GPA by air or 10 GPA for ground application. Do not apply more than 0.2 lb ai (12.8 fl oz) to field pea per acre per season. Do not make applications less than 7 days apart.
bifenthrin + zeta-cypermethrin Hero <i>RUP</i>	0.04 - 0.10	4.0 - 10.3 fl oz	PHI = 3 days. Do not apply more than 0.266 lb ai per acre per season. Do not make applications less than 5 days apart.
carbaryl Sevin	0.5 - 1.5	rate varies by formulation	PHI = 21 days. Do not apply within 14 days of graze or harvest for forage.
cyfluthrin Tombstone Tombstone Helios <i>RUP</i>	0.025 - 0.050	1.6 - 3.2 fl oz	PHI = 7 days. Maximum of 6.4fl oz per acre per season. Maximum of 3.2 fl oz per acre between 14-day interval. Minimum application volume is 10 GPA by ground and 2 GPA by air. Do not feed treated vines or hay to livestock.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
esfenvalerate Asana XL <i>RUP</i>	0.02 - 0.03	Low Rate: 3.9 - 5.8 fl oz	PHI = 21 days. The lower rates are for control of first- and second-stage grasshoppers ONLY. The reduced-rate application has a range of 3.9 - 5.8 fl oz. The higher rates are for control of grasshopper nymphs larger than 2 nd instar. Do not apply more than 0.2 lb ai/acre per season. Do not feed or graze livestock on treated fields. Apply with a minimum of 2 GPA for air and 10 GPA for ground applications.
	0.03 - 0.05	High Rate: 5.8-9.6 fl oz	
gamma-cyhalothrin Proaxis <i>RUP</i>	0.01 - 0.015	2.56 - 3.84 fl oz	PHI = 21 days. Label includes aphid, grasshopper, cutworm and others. Proaxis may be used to control grasshoppers in bordering, non-crop areas that are not hayed or grazed.
lambda-cyhalothrin Lambda-Cy Silencer Grizzly Z <i>RUP</i>	0.02 - 0.03	2.56 - 3.84 fl oz	PHI = 21 days. Label includes aphid, grasshopper, cutworm and others. Warrior II may be used to control grasshoppers in bordering, non-crop areas that are not hayed or grazed. Do not graze livestock in treated area or harvest vines for forage or hay. Do not apply more than 0.12 lb ai per acre per season.
lambda-cyhalothrin Kaiso 24 WG <i>RUP</i>	0.02 - 0.03	1.33 - 2.0 oz	
lambda-cyhalothrin Warrior II <i>RUP</i>	0.02 - 0.03	1.28 - 1.92 fl oz	
zeta-cypermethrin Mustang Max Mustang Max EC Respect <i>RUP</i>	Aphids Grasshoppers 0.02 0- 0.025	Aphids Grasshoppers 3.2 - 4 fl oz	PHI = 21 days. Do not apply more than 0.15 lb AI per acre per season including at-planting plus foliar applications. Do not make applications less than 5 days apart. Apply by air or by ground using sufficient water to obtain full coverage. Use a minimum of 2 gals per acre by air and 10 gals per acre by ground.
	Leafhoppers 0.017 - 0.025	Leafhoppers 2.72 - 4 fl oz	

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LYGUS BUG (TARNISHED PLANT BUG)

The lygus bug or "tarnished plant bug" has been documented as a serious pest of many fruit and vegetable crops, but has not yet been demonstrated to cause significant problems in North Dakota field pea. Lygus bugs feed preferentially on meristematic tissue or developing reproductive tissue. Damage to flower buds or developing seeds occurs in other legume crops. It was suspected that lygus feeding caused a problem referred to as "chalk spot." It is a chalky white spot which may appear on the cotyledons of some legumes. It affects the appearance of the seed, lowering the grade and marketability. In 1996, chalk spot was a major concern in the North Dakota pea crop; however, no evidence was found that lygus bug caused the damage. The probable cause was pea being harvested at too high a moisture content. Peas harvested at high moisture levels are susceptible to bruising when harvested or handled roughly, resulting in damage similar to chalk spot.

Economic Threshold:

None has been determined for the region.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
beta-cyfluthrin Baythroid XL <i>RUP</i>	0.019 - 0.025	2.4 - 3.2 fl oz	PHI = 7 days. Maximum of 6.4fl oz per acre per season. Maximum of 3.2 fl oz per acre between 14-day interval. Minimum application volume is 10 GPA by ground and 2 GPA by air. Do not feed treated vines or hay to livestock.
bifenthrin Brigade 2EC Fanfare 2EC Sniper <i>RUP</i>	0.025 - 0.10	1.6 - 6.4 fl oz	PHI = 14 days. Apply in a minimum of 2 GPA by air or 10 GPA for ground application. Do not apply more than 0.2 lb ai (12.8 fl oz) to field pea per acre per season. Do not make applications less than 7 days apart.
carbaryl Sevin	0.5 - 1.5	rate varies by formulation	PHI = 21 days. Do not apply within 14 days of graze or harvest for forage.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
cyfluthrin Tombstone Tombstone Helios <i>RUP</i>	0.025 - 0.050	1.6 - 3.2 fl oz	PHI = 7 days. Maximum of 6.4fl oz per acre per season. Maximum of 3.2 fl oz per acre between 14-day interval. Minimum application volume is 10 GPA by ground and 2 GPA by air. Do not feed treated vines or hay to livestock.
dimethoate Dimethoate 4EC Dimethoate 4E Dimate 4EC	0.5	16 fl oz	PHI = 7 days. Do not feed or graze hay within 21 days of last application. Do not make more than 1 application per season.
gamma-cyhalothrin Proaxis <i>RUP</i>	0.01 - 0.015	2.56 - 3.84 fl oz	PHI = 21 days. Label includes aphid, grasshopper, cutworm and others. Proaxis may be used to control grasshoppers in bordering, non-crop areas that are not hayed or grazed.
lambda-cyhalothrin Lambda-Cy Silencer Grizzly Z <i>RUP</i>	0.02 - 0.03	2.56 - 3.84 fl oz	PHI = 21 days. Do not graze livestock in treated area or harvest vines for forage or hay. Do not apply more than 0.12 lb ai per acre per season.
lambda-cyhalothrin Kaiso 24 WG <i>RUP</i>	0.02 - 0.03	1.33 - 2.0 oz	
lambda-cyhalothrin Warrior II <i>RUP</i>	0.02 - 0.03	1.28 - 1.92 fl oz	
zeta-cypermethrin Mustang Max Mustang Max EC Respect <i>RUP</i>	Aphids Grasshoppers 0.02 0- 0.025 Leafhoppers 0.017 - 0.025	Aphids Grasshoppers 3.2 - 4 fl oz Leafhoppers 2.72 - 4 fl oz	PHI = 21 days. Do not apply more than 0.15 lb AI per acre per season including at-planting plus foliar applications. Do not make applications less than 5 days apart. Apply by air or by ground using sufficient water to obtain full coverage. Use a minimum of 2 gals per acre by air and 10 gals per acre by ground.

RUP - Restricted use pesticide

PEA APHID

The most common insect pest found in field pea is the pea aphid. They are small, about 1/8+ inch long, and pale green. In North Dakota, aphids usually do not reach economic levels in field pea. Aphid populations are usually kept low by heavy rains or by beneficial insects such as parasitoid wasps and predators such as lady bird beetle and lacewings.

Scouting for aphids in pea is conducted using either a sweep net or examining the number of aphids per plant tip when 50 to 75 percent of the peas are flowering. Take 180 degree sweeps using a 15-inch sweep net or check at least five 8-inch plant tips from four different locations in the field. Population estimates should be calculated by averaging counts taken from four separate areas of the field.

Economic Thresholds:

Canadian entomologists suggest the following guidelines. Economic thresholds may vary depending on the value of the crops and cost of control, as well as variation in potential seed weight caused by variation in precipitation and heat stress. The economic threshold in peas at \$5.71 per bushel and average control cost of \$6.73-\$9.25/acre is 2 to 3 aphids per 8-inch plant tips, or 9 to 12 aphids per sweep (or 90 to 120 aphids per 10 sweeps), at flowering. If the economic threshold is exceeded, a single application of insecticide when 50% of plants have produced some young pods will protect the crop against yield loss and be cost-effective. Cultivars of peas may also vary in their tolerance to feeding by pea aphids, thus economic injury levels may differ between cultivars. The economic thresholds presented above were developed using "Century" field peas.

Aphid feeding on peas in the flowering and early pod stage can result in lower yields due to less seed formation and smaller seed size. Protein content and other quality issues do not appear to be affected.

The following table relates yield loss in peas for average aphid counts from 1 to 8 aphids per 8-inch pea stem tip when about 25% of the crop has begun to flower.

Aphids per sweep	Aphids per tip	% yield loss
7	1	3.4
10	2	4.9
12	3	6.1
15	4	7.1
16	5	8.0
18	6	8.8
20	7	9.6
21	8	10.3

Research in Manitoba has shown that insecticides applied when pods first form protects pea yield better than earlier or later applications. Control at the early pod stage provides protection through the pod formation and elongation stages, which are very sensitive to aphid damage.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
beta-cyfluthrin Baythroid XL <i>RUP</i>	0.019 - 0.025	2.4 - 3.2 fl oz	PHI = 7 days. Maximum of 6.4fl oz per acre per season. Maximum of 3.2 fl oz per acre between 14-day interval. Minimum application volume is 10 GPA by ground and 2 GPA by air. Do not feed treated vines or hay to livestock. For pea aphid, use high rate of 3.2 fl oz/acre for pest suppression only.
bifenthrin Brigade 2EC Fanfare 2EC Sniper <i>RUP</i>	0.025 - 0.10	1.6 - 6.4 fl oz	PHI = 14 days. Apply in a minimum of 2 GPA by air or 10 GPA for ground application. Do not apply more than 0.2 lb ai (12.8 fl oz) to field pea per acre per season. Do not make applications less than 7 days apart.
carbaryl Sevin	0.5 - 1.5	rate varies by formulation	PHI = 21 days. Do not apply within 14 days of graze or harvest for forage. Not labeled for pea aphid.
cyfluthrin Tombstone Tombstone Helios <i>RUP</i>	0.025 - 0.050	1.6 - 3.2 fl oz	PHI = 7 days. Maximum of 6.4fl oz per acre per season. Maximum of 3.2 fl oz per acre between 14-day interval. Minimum application volume is 10 GPA by ground and 2 GPA by air. Do not feed treated vines or hay to livestock. For pea aphid, use high rate of 3.2 fl oz/acre for pest suppression only.
dimethoate Dimethoate 4EC Dimethoate 4E Dimate 4EC	0.125 - 0.5	0.33 - 1 pt	PHI = 7 days. Do not feed or graze hay within 21 days of last application. Do not make more than 1 application per season.
esfenvalerate Adjourn Asana XL <i>RUP</i>	0.03 - 0.05	5.8 - 9.6 fl oz	PHI = 21 days. Do not apply more than 0.2 lb ai/acre per season. Do not feed or graze livestock on treated fields. Apply with a minimum of 2 GPA for air and 10 GPA for ground applications.
gamma-cyhalothrin Proaxis <i>RUP</i>	0.01 - 0.015	2.56 - 3.84 fl oz	PHI = 21 days. Proaxis may be used to control grasshoppers in bordering, non-crop areas that are not hayed or grazed.
imidacloprid Attendant 600 Senator 600	refer to recommended label rate	1.6 - 3.2 fl oz per cwt of seed	Apply as a commercial seed treatment. Follow all applicable directions, restrictions and precautions on the EPA registered label. For control of early season aphids.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
imidacloprid Enhance AW	refer to recommended label rate	5 oz per 100 lbs of seed	Apply as an on-farm seed treatment at planting time. Do not graze or feed livestock on treated area for 60 days after planting. Follow all applicable directions, restrictions and precautions on the EPA registered label. For control of early season aphids.
imidacloprid Admire Pro	0.25 - 0.38	7.0 - 10.5 fl oz	PHI = 21 days. Maximum of 10.5 fl oz per acre per season. Apply using one of the following methods: 1) Chemigation into root zone, 2) In-furrow spray at planting directed on or below seed; 3) In a narrow (2" or less) surface band over seed-line during planting incorporating to a depth of 1 to 1.5' with sufficient irrigation within 24 hours following applications, 4) In a narrow band directly below the eventual seed row in a bedding operation 7 or fewer days before planting, or 5) As a post-seeding drench, transplant drench or hill drench.
imidacloprid Mana Alias 4F	0.25 - 0.38	8.0 - 12.0 fl oz	PHI = 21 days. Maximum amount allowed per season 12 fl oz/acre/season. Apply using one of the following methods: 1) Chemigation into root zone, 2) In-furrow spray at planting directed on or below seed; 3) In a narrow (2" or less) surface band over seed-line during planting incorporating to a depth of 1 to 1.5' with sufficient irrigation within 24 hours following applications, 4) In a narrow band directly below the eventual seed row in a bedding operation 7 or fewer days before planting, or 5) As a post-seeding drench, transplant drench or hill drench.
imidacloprid Mana Alias 4F	0.044	1.4 fl oz	PHI = 7 days. Minimum interval between applications = 5 days. Maximum of 4.2 fl oz per acre (0.13 lb ai per acre) allowed per crop season.
imidacloprid Nuprid 2F	see label	16 - 24 fl oz	PHI = 21 days. Maximum amount allowed per season 24 fl oz/acre/season. Apply using one of the following methods: 1) Chemigation into root-zone through low-pressure drip, trickle, microsprinkler or equivalent equipment, 2) In-furrow spray during planting directed on or below seed, 3) Narrow band spray at ground cracking directly over the row during hilling covered with 3 In a narrow (2" or less) surface band over seed-line during planting incorporated to a depth of 1 to 1.5 inches with sufficient irrigation within 24 hours following application, 4) In a narrow band directly below the eventual seed row in a bedding operation 7 or fewer days before planting, or 5) As a post-seeding drench, transplant drench, or hill drench. Not for use on crops grown for seed unless allowed by state-specific supplemental labeling.
lambda-cyhalothrin Lambda-Cy Silencer Grizzly Z	0.02 - 0.03	2.56 - 3.84 fl oz	PHI = 21 days. Do not graze livestock in treated area or harvest vines for forage or hay. Do not apply more than 0.12 lb ai per acre per season.
<i>RUP</i>			
lambda-cyhalothrin Kaiso 24 WG	0.02 - 0.03	1.33 - 2.0 oz	
<i>RUP</i>			
lambda-cyhalothrin Warrior II	0.02 - 0.03	1.28 - 1.92 fl oz	
<i>RUP</i>			

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
zeta-cypermethrin	Aphids	Aphids	PHI = 21 days. Do not apply more than 0.15 lb AI per acre per season including at-planting plus foliar applications. Do not make applications less than 5 days apart. Apply by air or by ground using sufficient water to obtain full coverage. Use a minimum of 2 gals per acre by air and 10 gals per acre by ground.
Mustang Max	Grasshoppers	Grasshoppers	
Mustang Max EC	0.02 0- 0.025	3.2 - 4 fl oz	
Respect			
	<i>RUP</i>	Leafhoppers	Leafhoppers
		0.017 - 0.025	2.72 - 4 fl oz

RUP - Restricted use pesticide

WIREWORMS

Wireworms are most likely to be problems when field peas follows pasture or grassland. Infestations often are found in coarse textured soils (sandy loam) where moisture is abundant, perhaps in low spots of fields.

Thresholds:

There is no easy way to estimate wireworm infestations. Two methods are currently used.

Soil Sampling: Sample 20, well spaced, 1 square foot sites to a depth of 4 to 6 inches for every 40 acres being planted. If an average of 1 wireworm per square foot is found, treatment would be justified.

Solar Baiting: In September, establish bait stations for 2 to 3 weeks before freeze. Place bait stations randomly through the field, but representing all areas of the field. There should be 10 - 12 stations per 40 acre field. Place one cup wheat and one cup shelled corn in a 4- to 6-inch deep hole. Cover grain with soil and then an 18-inch square piece of clear plastic. Dig up the grain. If an average of one or more wireworm larvae are found per station, treatment would be justified.

Seed Treatment: Please the seed treatment section in the introduction for more information.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
bifenthrin	0.04 - 0.08	3.4 - 6.8 fl oz	Do not apply more than 0.1 lb ai per acre per season as an at-plant application. Do not apply more than 0.3 pound active per acre per season including at-plant plus foliar applications of other bifenthrin products (such as Capture 2EC). Apply as a 5-7 inch band over the open furrow (T-band), or in-furrow with the seed.
Capture LFR	<i>RUP</i>	0.0023 - 0.0046	
		pounds active per 1000 linear feet of row	0.20 - 0.39 fl oz per 1000 linear feet of row
imidacloprid	refer to recommended label rate	1.6 - 3.2 fl oz per cwt of seed	Apply as a commercial seed treatment. Follow all applicable directions, restrictions and precautions on the EPA registered label.
Attendant 600 Senator 600			
imidacloprid	refer to recommended label rate	5 oz per 100 lbs of seed	Apply as an on-farm seed treatment at planting time. Do not graze or feed livestock on treated area for 60 days after planting. Follow all applicable directions, restrictions and precautions on the EPA registered label.
Enhance AW			

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