Successful Lima Bean Production

Lima beans (Phaseolus lunatus L.) are an important crop in Delaware and the mid-Atlantic region of the United States. Grown primarily for processing, lima beans are planted on more acres in Delaware than any other vegetable crop. Other major production areas for succulent, green lima beans grown for canning or freezing are California, the Pacific Northwest, and New York State. Delaware and nearby Marlyan plants more acreage annually (20,000 acres) than any of these areas. The total annual acreage of lima beans planted for succulent bean processing purposes in the United States is approximately 40,000 acres. Lima beans are also planted in California and other western areas for dry bean use.

In Delaware, lima beans are considered to be a cornerstone crop of the vegetable-processing industry. Because the state is one of the few areas that produce the crop, Delaware offers a unique item for local processors to sell. Lima beans are double-cropped on as much as three-fourths of the acreage, thus offering producers maximum utilization of land. Limas are often planted in June or July after a pea or small grain crop. The same harvesting equipment is used for peas (Pisum sativum L.) and lima beans, so. capitalization costs can be spread over two crops per year.

Typically, the grower contracts with a processing company for a certain acreage. In most cases, the processing company performs the harvest and raw product delivery functions, although there are instances of growers owning their own harvest equipment. In the latter case, the processor pays a higher price for the lima beans.

The Lima Bean Plant

Lima beans come in a wide variety of types and forms. Climbing lima bean varieties known as Pole Beans because of the pole that supports their growth and are a very popular in home gardens and with market gardeners. However, the varieties developed for commercial production have more determinate growth habits. Smaller, bush types are necessary for mechanical harvest.

A significant fact about the lima bean's origin still impacts the industry today. There are two major sub-groups: the meso-American and the Andean. They have been shown to be genetically distinct sub-groups by DNA analysis. Direct descendants of the meso-American sub-group are the baby lima bean varieties, which exhibit more heat tolerance than the Fordhook types, the descendants of the Andean group. The cooler Andean conditions in the higher elevations would not require the development of heat tolerance that the meso-American area would need.

Many factors influence lima bean yields, but weather conditions that affect flower bud development, pollination, and pod maturation have the most impact on yields in Delaware. Low lima bean yields are associated with profuse abscission of flowers and developing pods. Research conducted at the University of Delaware has shown that high temperatures, low relative humidity, and low soil moisture lead to reduced pod set and retention. Temperatures of 90 degrees Fahrenheit or above reduce pollination and pod set. Prolonged drought (7 days or more with less than 1 inch of water) also negatively affects yield. High humidity favors pollination and pod set and is one reason lima beans have been grown successfully in Delaware. Fogs, heavy dews, and their moderating effects on temperature are helpful to pollination and pod set. High night temperatures also adversely affect yields, because energy is consumed through respiration, thereby limiting the plants physiological ability to set and retain pods.

Lima bean flower are produced on an indeterminate raceme; three flowers appear at each node along the raceme. Recent research conducted at The University of Delaware identified important phenomena related to flowering. The two outer flowers at each node begin to develop simultaneously, while the middle structure lagged in development. If one or both of the outer structures abscised, the middle structure continued to develop, but at a greater rate than when the outer two flowers continued to develop into fruit. In Delaware, this "reflowering" contributed very little to final yield, while concurrent studies in California found that re-flowering accounted for up to 75 percent of the final pod set.

Depending on variety, first flowering generally occurs at 35 days from planting, and peak flowering at 60 days; harvest occurs from 80 to 90 days for baby varieties, and 90 to 100 days for Fordhook varieties. However, a wide range of factors can influence maturity, including temperature, drought, and any environmental conditions that cause a prolonged flowering period (split-set).

Best Production Practices

Liming & Fertilization - Adjust the pH of the soil to 5.8 to 6.5. On most soil types in Delaware, pH in this range provides the optimum availability of plant nutrients. A pH from 6.5 to 7.0 will generally not be detrimental to lima bean yields, however, liming to reach a pH of 6.5 or greater is unnecessary.

Lima beans are legumes that may fix atmospheric nitrogen with the aid of N-fixing bacteria that live in the roots of lima beans. The amount of N-fixed varies, depending on a wide range of conditions. The table below outlines nitrogen, phosphorus, and potassium requirements. Note the recommendation for nitrogen is significantly altered for lima beans planted as a single, full-season crop (60-90 pounds N/acre) versus those double-cropped after peas, another legume (20-40 pounds N/acre).

		Soil Phosphorus Level				Soil Potassium Level				
	Pounds N per Acre	Low	Med	High (Opt.)	Very High	Low	Med	High (Opt.)	Very High	Nutrient Timing and Method
		Pounds P_2O_5 per Acre				Pounds K_2O per Acre				
Lima Bean	60-90	100	60	20	0[1]	140	100	60	0[1]	Total nutrient recommended.
Single Crop	30-40	100	60	20	0[1]	140	100	60	0[1]	Broadcast and disk-in.
	20	0	0	0	0	0	0	0	0	Band place with planter.
	20	0	0	0	0	0	0	0	0	Sidedress 3-5 weeks after emergence.
Lima Bean	20-40	0	0	0	0	0	0	0	0	Total nutrient recommended.
After peas	20	0	0	0	0	0	0	0	0	Band place with planter.
	20	0	0	0	0	0	0	0	0	Optional Sidedress 3-5 weeks after emergence

There is no demonstrated need for minor element fertilization on lima beans if soil pH is at the recommended level. This is especially true if the field has a history of cover crops or manure applied in the field. The decomposition of these organic materials provide levels of minor elements to supply the crop and to enhance the minor element level of the soil.

Variety Selection - The baby lima and Fordhook varieties listed below are recommended for several reasons: consistent yield performance, disease resistance, and availability. Maturities (days from planting) are given on the best evidence from Delaware Variety Trials and commercial experience. Maturity can vary from season to season and even within a season, depending on conditions. For planning purposes, the relative differences between varieties are important. The source of each variety is listed at the end of its description.*

Baby Lima Varieties

The following are the baby lima beans being grown currently in Delaware

Lima Beans, Baby Types*	
Cypress	77 days, cold soil tolerance, resistant to downy mildew race E, compact, cold tolerant, heat susceptible, for later plantings
Meadow	77 days, resistant to downy mildew race E, compact, heat susceptible, for later plantings
Maestro	77 days, resistant to downy mildew race E, compact, heat susceptible, for later plantings
184-85	86 days, resistant to downy mildew race E, large plant, high set, for earlier plantings
C-elite Select	84 days, resistant to downy mildew race E, large plant, high set, for earlier plantings
M-15	80 days, resistant to downy mildew race F, small plant but sets on runners, lower recovery
Jackson Wonder	85 days, no resistance to current races of downy mildew, speckled type
Dixie Butter Pea	75 days, no resistance to current races of downy mildew

Tillage, Planting Method, Date, Rate, and Spacing - Lima beans are planted in scheduled plantings, coordinated by processors, to accommodate orderly flow of raw product into the processing plant. These schedules are based on the amount of acreage that can be harvested per day by the harvesting operation of the processor. The growers with their own harvest equipment must coordinate their planting and harvest schedules with the processors.

Lima beans are best grown using conventional tillage. Research has shown that no-till lima beans yield significantly less than conventional lima beans and plant residue can slow harvest. Lima beans are highly responsive to cultivation and should be cultivated 1-3 times up to row closure.

Baby lima beans may be planted as early as May 5 and as late as July 20 in the Mid-Atlantic. Fordhook lima beans cannot be planted after July 5, because their longer maturity will not escape frost at the later dates. The earliest plantings are subject to reduced stand due to cold soils. Minimum soil temperature for best germination is 60 degrees. The latest plantings must mature before frost, hence early-maturing varieties must be planted before July 10. The optimum range is May 30 to July 10. As indicated earlier, early plantings that mature in August and early September are subject to reduced yields from heat and drought.

Planting depth is also critical. Beans should be planted no deeper than 1.5 inches, with 1 to 1.5 inches the optimum depth for most conditions. Extremely dry soils may warrant deeper planting.

Baby lima beans can be planted in rows 30 to 36 inches apart. They should be planted at rates to give 3 to 4 plants per foot. Fordhooks should be planted to give 2 plants per foot. Research results on narrow-row beans are mixed. Excellent weed control and irrigation are necessary to successfully produce and harvest lima beans in narrow rows. Even when this is achieved, there has been no clear yield advantage to advocate narrow-row lima beans. Further research and commercial experience is ongoing to address this issue.

Seed size varies among varieties and must be taken into account when determining pounds of seed needed per acre. Baby lima bean varieties range from 1,150 seeds per pound to 1,450 seeds per pounds. Fordhook varieties range from 440 to 550 seeds per pound.

Weed Control and Cultivation - Good weed control is essential to achieving good yields and to facilitating harvest operations. Weeds compete with the lima bean plant for nutrients, water, and sunlight. Heavy weed populations also can create environments more favorable for

plant diseases and harboring insects. Weedy fields at harvest reduce raw product recovery by the harvesters and generate more trash. Handling trash reduces efficiency and adds cost during raw product preparation operations at the processing plant. Mechanical Cultivation is a major part of a weed control program in lima beans. Proper cultivation not only will enhance weed control, but can improve recovery of raw product during harvest, thus increasing the harvested yield per acre. Cultivating too deeply or creating a ridge that restricts the harvester's ability to harvest the lower portion of the plant will reduce harvested yields. To improve harvest recovery, cultivate in a way that leaves the field as flat as possible, either by cultivating slowly or with cultivating equipment like s-tine cultivators designed to maintain level fields.

Recommended Herbicides for Lima Bean in Delaware

Preplant Incorporated

Imazethapyr --0.024 to 0.031 lb/A. Apply 1.5 to 2.0 fluid ounces per acre Pursuit 2SC. Shallow, thorough incorporation improves consistency of performance when dry weather follows application. Primarily controls broadleaf weeds. Combine with another herbicide to control annual grasses. Pursuit residues persist in the soil after harvest and may affect following crops. DO NOT exceed 2 fluid ounces per acre of Pursuit 2SC at planting or make more than one application per acre per year. Follow label instructions pertaining to following crops.

S-metolachlor--0.63 to 1.91 lb/A. Apply 0.66 to 2.00 pints per acre Dual Magnum 7.62E. Incorporate 2 to 3 inches deep by disking twice with blades set 4 to 6 inches deep. Primarily controls annual grasses and nutsedge. Do NOT use on black turtle soup beans. **Other generic versions of metolachlor and s-metolachlor may be available, and may or may not be labeled for use in the crop.**

Pendimethalin --0.48 lb/A. Apply 1.0 pint of Prowl H_2O or OLF per acre and incorporate to mix thoroughly with the top 2 to 3 inches of soil. Primarily controls annual grasses and certain broadleaf weeds. Do not use when soils are cold and/or wet soil conditions are anticipated during emergence, or crop injury may result. **Not recommended in New Jersey.**

Trifluralin--0.5 to 0.75 lb/A. Apply 1.0 to 1.5 pints per acre of Treflan 4E or 10 to 15 pounds per acre of Treflan 5G. Incorporate it into 2 to 3 inches of soil within 8 hours after application. Primarily controls annual grasses and a few broadleaf weeds. Treflan may be applied up to 4 weeks prior to planting. Do not use or reduce the rate used when cold, wet soil conditions are expected, or crop injury may result.

Preemergence

Carfentrazone + sulfentrazone --0.008 to 0.01 + 0.074 to 0.092 lb/A. Apply 3.00 to 3.75 fluid ounces per acre Spartan Charge to control many annual broadleaf weeds, including ALS resistant pigweed species. Combine with another herbicide to control annual grasses. Apply no later than 3 days after seeding, but do NOT apply after cracking. Expect some temporary crop injury after emergence. DO NOT use Spartan Charge if temporary crop injury is not acceptable. **Labeled for use in Delaware ONLY!**

Halosulfuron--0.024 to 0.047 lb/A. Apply 0.5 to 1.0 dry ounces of Sandea 75DF preemergence to control or suppress yellow nutsedge and many annual broadleaf weeds. Results have been most consistent when the application was followed by rainfall or irrigation. Use the lower rate on coarse-textured (sandy) soils low in organic matter, and the higher rate on fine-textured (silt and clay) soils. Observe a thirty (30) day preharvest interval (PHI). Do NOT apply Sandea to crops treated with a soil applied organophosphate insecticide, or use a foliar applied organophosphate insecticide within 21 days before or 7 days after a Sandea application.

Imazethapyr --0.024 to 0.047 lb/A. Apply 1.5 to 3.0 fluid ounces per acre Pursuit 2SC. Weed control may be inconsistent when dry weather follows application. Primarily controls broadleaf weeds. Combine with another herbicide to control annual grasses. Pursuit residues persist in the soil after harvest and may affect following crops. DO NOT apply more than 3.0 fluid ounces of Pursuit 2SC per acre per year. Follow label instructions pertaining to following crops.

S-metolachlor--0.63 to 1.91 lb/A. Apply 0.66 to 2.00 pints per acre Dual Magnum 7.62E. Primarily controls annual grasses and a few broadleaf weeds. Do NOT use on black turtle soup beans. **Other generic versions of metolachlor and s-metolachlor may be available, and may or may not be labeled for use in the crop.**

Sulfentrazone *plus* carfentrazone (jug-mix)--0.082 to 0.103 lb/A. **A Special Local-Needs Label 24(c) has been approved for the use of Spartan Charge for lima beans in Delaware only.** Apply 3 to 3.75 fl oz per acre of Spartan Charge 3.5 EC as a preemergence application. Spartan Charge will injure emerged lima beans as well as plants that have germinated and are very close to breaking through the soil surface. Use the lower rate on sandy soils with low organic matter. The 24c Label for use of Spartan Charge in lima beans is for control of ALS-resistant pigweed (Group 2 herbicides). At this low rate, Spartan Charge will provide early-season control of pigweed, but do not expect to see significant control of most other species on the label of

sulfentrazone products. The level of crop safety is marginal with Spartan Charge and so overlaps will cause injury. Similarly, rinsing tanks in the field can increase the risk of injury as well. Sandy soils or sandy knolls in fields are likely to show injury. Injury can occur if Spartan Charge treated soil is splashed onto emerging and very young seedlings. To reduce this risk, apply Spartan Charge immediately after planting, followed by irrigation to move the herbicide into the soil, rather than allowing it to remain on the soil surface. University of Delaware research shows that most fields will recover from injury and not impact maturity dates or yield.

Postemergence

Bentazon--0.5 to 1.0 lb/A. Apply 1.0 to 2.0 pints per acre Basagran 4SC when beans have fully expanded first trifoliate leaves. Use lower rate to control common cocklebur, mustards, and jimsonweed and the higher rate to control yellow nutsedge, common lambsquarters, common ragweed, and Canada thistle. Temporary, pronounced crop injury may be observed that can result in delayed maturity. The use of oil concentrate may increase the risk and severity of crop injury. To reduce the risk of crop injury, omit additives or switch to a nonionic surfactant when weeds are small and soil moisture is adequate. Do not spray when temperatures are over 90°F (32.2°C).

Clethodim--0.094 to 0.125 lb/A. Apply 12.0 to 16.0 fluid ounces of Select Max 0.97EC with nonionic surfactant to be 0.25% of the spray solution (1.0 quart per 100 gallons of spray solution) postemergence to control many annual and certain perennial grasses, including annual bluegrass. Select will not consistently control goosegrass. Control may be reduced if grasses are large or if hot, dry weather or drought conditions occur. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within 2 to 3 days of any other pesticide unless labeled, as the risk of crop injury may be increased, or reduced control of grasses may result. Observe a minimum preharvest interval of 21 days.

Halosulfuron--0.024 to 0.031 lb/A. Apply 0.50 to 0.66 dry ounces of Sandea 75DF plus nonionic surfactant to be 0.25 percent of the spray solution (1.0 quart per 100 gallons of spray solution) postemergnence to control yellow nutsedge and certain annual broadleaf weeds. Use only the lower rate when treating snap beans. Applications should be sprayed when the crop has 2 to 3 trifoliate leaves and annual weeds are less than 2 inches tall. Treatments applied when beans are younger increases the risk of temporary stunting, and applications after the 3 trifoliate leaf stage increases the risk of a split set. Susceptible broadleaf weeds usually exhibit injury symptoms within 1 to 2 weeks of treatment. Typical symptoms begin as yellowing in the growing point that spreads to the entire plant and is followed by death of the weed. Injury symptoms are similar when yellow nutsedge is treated but may require 2 to 3 weeks to become evident and up to a month for the weed to die. Occasionally, slight yellowing of the crop may be observed within a week of Sandea application. When observed, recovery is rapid with no effect on yield or maturity. Sandea is an ALS inhibitor. Herbicides with this mode of action have a single site of activity in susceptible weeds. The risk of the development of resistant weed populations is high when herbicides with this mode of action are used continuously and exclusively to control a weed species for several years or in consecutive crops in a rotation. Integrate mechanical methods of control and use herbicides with a different mode of action to control the target broadleaf weeds when growing other crops in the rotation. Observe a thirty (30) day preharvest interval (PHI). Do NOT apply Sandea to crops treated with a soil applied organophosphate insecticide, or use a foliar applied organophosphate insecticide within 21 days before or 7 days after a Sandea application.

Imazamox --0.031 lb/A. Labeled and recommended for use in DE, MD, and VA only. Apply 4.0 fluid ounces of Raptor 1SC per acre to control annual broadleaf weeds when the crop has one to two fully expanded trifoliate leaves. Add nonionic surfactant to be 0.25% of the spray solution (1.0 quart per 100 gallons of spray). Add 0.5 to 1.0 pint of bentazon (Basagran) to reduce the expression of injury symptoms. Strictly observe all plantback restrictions. Raptor is an ALS inhibitor. Herbicides with this mode of action have a single site of activity in susceptible weeds. The risk of the development of resistant weed populations is high when herbicides with this mode of action are used continuously and exclusively to control a weed species for several years or in consecutive crops in a rotation. Integrate mechanical methods of control and use herbicides with a different mode of action to control the target broadleaf weeds when growing other crops in the rotation. ALS resistant weeds are present in the mid-Atlantic region and will not be controlled.

Sethoxydim--0.2 to 0.3 lb/A. Apply 1.0 to 1.5 pints per acre Poast 1.5EC with oil concentrate to be 1.0 percent of the spray solution (1.0 gallon per 100 gallons of spray solution) postemergence to control annual grasses and certain perennial grasses. **The use of oil concentrate may increase the risk of crop injury when hot or humid conditions prevail**. To reduce the risk of crop injury, omit additives or switch to nonionic surfactant when grasses are small and soil moisture is adequate. Control may be reduced if grasses are large or if hot, dry weather or drought conditions occur. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within one week before or after Basagran or any other pesticide unless labeled. The risk of crop injury may be increased, or reduced control of grasses may result. Observe a minimum preharvest interval of 15 days and apply no more than 4 pints per acre in one season

Morningglory and pigweed are common weed problems in lima beans and Palmer amaranth is on the increase. Much of the pigweed is ALS herbicide resistant so field selection

is critical to avoid problems. Preharvest wiper application to pigweed above the lima bean canopy is a common practice to reduce harvest issues.

Horsenettle and black nightshade are concerns in lima bean production because of contamination of product with fruits.

Irrigation - Research completed in the '50s, '60s, and early '70s in Delaware indicated a positive response from irrigation, especially on lighter, sandy soils. However, temperatures above 90 degrees can override the possible benefits of irrigation by causing blossoms to drop.

As indicated earlier, later plantings of lima beans flower and set pods during the cooler conditions of late August and September and often experience more rainfall than earlier plantings. There is still a significant amount of lima bean acreage planted under dryland conditions in Delaware. Growers face the management decision of what crops offer the best potential return under irrigation. Although there is strong evidence (Table 4) of lima bean response to irrigation, other crops may offer better utilization of irrigation than late-season beans. However, there is little doubt than even in late-season conditions, irrigation reduces risks and offers better yield potential than non-irrigated conditions.

Disease Problems & Control - Downy mildew (Phytophthora phaseoli) has been a major disease problem in Delaware in the past, but the use of resistant varieties has successfully reduced the incidence of this disease in the past. However, most current varieties are susceptible to the current race of the disease that is prevalent and fungicides are necessary for control

Root rot can occur in lima beans. In Delaware, Rhizoctonia and Pythium are the major causal organisms of root rot in lima beans. Crop rotation with non-legume crops is important to minimize this disease. Plow under previous crop residue rather than disking it. Rhizoctonia is pervasive in many fields as a result of many years of legume cropping. Rhizoctonia usually does not kill the plant, but the distinct reddish-brown lesions on the stem are easily seen and reduced growth can result. Recommended Fungicides for Root Rots:

Apply following at planting:

Ridomil Gold--0.5 to 1.0 pt 4SL/A. Apply in a 7-inch band over the row at seeding. (for *Pythium* only)

To provide control of root rot caused by *Pythium* and *Rhizoctonia,* apply the following:

Uniform--0.34 fl oz 3.66SE/1000 ft row. Apply in a 7 in band after seeding. Avoid direct seed contact, which may cause delayed emergence.

To provide control of root rot caused by *Rhizoctonia*, apply the following in a band up to 7 inches wide:

Quadris--0.4 to 0.8 fl oz 2.08SC/1000 ft of row

White mold (Sclerotinia) can cause considerable losses in lima beans. Control recommendations are similar to that for snap beans (see below)

Preplant: **For white mold only.** Apply 3 to 4 months prior to disease onset to allow the active agent to reduce levels of sclerotia in the soil. Following application, incorporate to a depth of 1 to 2 inches but **do not plow** before seeding beans to avoid untreated sclerotia in lower soil layers from infesting the upper soil layer.

Apply the following:

Contans--2.0 to 4.0 lb 5.3WG/A

Post seeding: Fungicide sprays are needed when the soil has been wet for 6 to 10 days before bloom, a fungicide should be applied at 10-20% bloom. A second spray should be made 7-10 days after the first spray, if the soil remains wet and blossoms are still present. Check labels for details on fungicide timing. For lima beans, later fungicide applications have been beneficial if favorable environmental conditions persist.

Apply one of the following:

Endura--8.0 to 11.0 oz 70W/A

Endura--5.0 oz 70W/A plus thiophanate-methyl (0.7 to 1.05 lb/A 70WP/A active ingredient) (snap beans only)

iprodione--1.5 to 2.0 pts 4F/A or OLF

Omega--8.0 fl oz 500F/A (**also provides good downy mildew control**)

thiophanate-methyl--1.5 to 2.0 lb 70WP/A or OLF

Switch--11.0 to 14.0 oz/A 62.5WG

Switch--6.0 to 11.0 oz/A 62.5WG plus thiophanate-methyl (0.7 to 1.05 lb a.i./A)

Fontelis--16.0 to 30.0 fl. oz SC/A

Lima Bean Pod Blight (Phytophthora capsici) is on the increase in lima beans. Rotate away from other susceptible crops such as peppers, cucurbits or tomatoes. Avoid heavy irrigation and irrigating at night. In fields with a history of Phytophthora blight the following may suppress disease when applied for control of downy mildew:

Ridomil Gold Copper--2.0 lb 65 WP/A

Forum--6.0 fl. oz 4.18SC/A (Endura--8.0 to 11.0 oz 70W/A)

Anthracnose and gray mold (Botrytis) can also attack lima beans, but are rarely an economic problem.

Insect Problems & Control - Insect pests that attack lima beans include cutworms, tarnished plant bugs, stink bugs, mites, aphids, leafhoppers, Mexican bean beetles, corn earworms and fall armyworms. Growers should refer to Extension Bulletin 137, Commercial Vegetable Production Recommendations for specific insecticide controls. Always read the label carefully, and pay special attention to rates and pre-harvest intervals.

Tarnished plant but bugs and stink bugs require control in many years. Treat only if the number of adults and/or nymphs exceeds 15 per 50 sweeps from the pin pod stage until harvest.

Because significant acreage of lima beans are planted in June and July, late-season podworms (corn earworms and fall armyworms) are the major economic pests. Infestations can be very severe in some years, in other years they can be relatively light. Blacklight trap reports, which indicate the potential infestation, are reported weekly through Integrated pest hotlines and weekly crop newsletters. Information on these sources are available from county Extension

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offices.

For baby lima beans, treat when Corn Earworm populations exceed one per 6 feet of row from the late flat pod stage to harvest. For Fordhook lima beans, treat when Corn Earworm populations exceed two per 6 feet of row up to 4 weeks from harvest or three per 6 feet of row thereafter. For both lima beans, treatment should be timed when 50 percent or more of the Corn Earworm and/or Fall Armyworm populations reach a length of 1/2 inch or longer. Treating too early for young CEW/FAW populations will eliminate natural control and may result in additional sprays for reinfestations. Lannate at 2 to 4 pints/acre is recommended for podworm control.

Nematode Control - Various nematode genera can infect lima beans. Southern root knot nematode can be especially damaging. Crop rotation is useful in managing this pest. Mocap is a labeled nematicide in lima beans. Follow label directions.

Taking soil samples for nematode detection is strongly recommended in the fall prior to planting lima beans. A nematode assay taken at this time will have the best chance of detecting damaging levels of plant parasitic nematodes especially southern root knot nematode..

Best Harvest Practices

All limas beans grown for processing in Delaware are harvested mechanically with pod stripper combines. Proper adjustment and speed settings are necessary to reduce harvest losses.

Some trash particles are difficult to remove from the harvested product. Weeds like horsenettle and morningglory produce noxious seeds that are similar in size and/or color to lima beans. Noxious weed seeds as well as other foreign materials detected on a truck load can result in penalty or price deduction to the grower. Removal of these weed seeds with the cleaning systems on the combine with color sorters in the processing plant is difficult. Many times loads of lima beans must be re-sorted by hand when any noxious weed seeds are detected during a quality inspection. At present, the method to reduce weed seed content from the harvested product is a good weed-control program.

Overall, a systematic approach to production that includes proper variety selection, field preparation, cultivation, and combine adjustment and operation will minimize harvest loss and maximize product quality.