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Fact Sheet

Fact Sheet 463

Enterprise Guide for Southern Maryland: Growing Asparagus

Vegetable producers may want to consider growing asparagus to increase sales early in the season. Asparagus, like strawberries and early greens, attracts buyers to your farm. After an early season trip to your farm or market, the buyers will likely continue to visit to purchase other commodities. Although costs to establish a field of asparagus are fairly high, a well-managed field can produce profitably for many years.

Varieties

Within the last few years, a number of superior varieties from the New Jersey breeding program have become commercially available. These new hybrids have much better vigor, disease resistance, and yield potential than the older varieties. The four that are now available are Jersey General, Jersey Giant, Jersey King, and Jersey Knight. All are resistant to rust and tolerant to fusarium root rot.

Field Selection

Since asparagus is an herbaceous perennial that will be in the same field for many years, site selection and field preparation are very important. Select a field with deep, well-drained soil that has never had asparagus grown in it. Loams, sandy loams, and loamy sands are preferred if a choice of soil type is available. Try to choose a field with a pH no less than 6.0, since asparagus does not tolerate acidic soils. Asparagus does not respond to irrigation as do other vegetables, so the field does not need to have irrigation available for the entire growing season.

Soil Preparation and Fertilization

Much of the liming and fertilization of the field and control of perennial weeds should be done at least one year before planting. Because soil fertility and pH are critical to the success of this crop, be sure to have the soil tested and include a special test for boron. Contact your local Maryland Cooperative Extension office for information on having the soil tested through the University of Maryland Soil Testing Lab for a small fee. Apply lime, if needed, to raise the pH into a range from 6.7 to 7.0. Plant growth will decline if pH values are allowed to drop to about 6.2 or lower. Apply phosphorus and potash fertilizers in amounts to raise soil test values into the optimum range.

Established asparagus fields should be fertilized prior to the cutting season each year according to soil tests. A general recommendation would be for 75 pounds of nitrogen, 100 pounds of phosphate, and 150 pounds of potash per acre before the start of the cutting season. Most soils will need an application of two pounds of boron per acre every three years.

Producing Crowns

Most growers plant asparagus using 1-year-old asparagus crowns from a reputable nursery. If you choose to buy crowns, be sure to order them early, preferably one year in advance. It is possible, however, to produce your own crowns.

- Plant the asparagus seed 1year before setting the crowns. Approximately 9,000 to 10,000 crowns will be required to set an acre. Since an ounce of seed produces around 500 good plants, 1 1/4 pound of seed should produce enough plants for an acre.
- Select a site where asparagus has not been grown before. The soil should be well drained; lighter soils are preferred.
- Plant in mid-April as soon as the soil can be worked. Sow the seeds by drilling approximately 10 to 12 seeds per foot of row, 1 1/2 inches deep, and in rows 24 to 30 inches apart.

Irrigation may be required for the germination and establishment of young plants, especially on sandy soils. As the young plants grow, the crowns will also grow and develop in size. Dig the crowns as early as possible the following spring for field production.

Planting the Crowns

Crowns should be planted in April using either the crowns you have grown or the crowns ordered in advance from the nursery. Space them 12 inches apart in rows 4 1/2 to 5 feet apart. Set crowns in a furrow 6 to 8 inches deep and cover them with 1 to 2 inches of soil.

Irrigate just enough to keep the soil moist. This will enable the buds to send up young shoots (ferns). During the first season, gradually fill in the furrow with soil, but be sure that the young ferns are never completely covered.

Producing and Planting Transplants

An alternative to planting from crowns is to use greenhouse-grown transplants. To grow transplants, sow seed 12 to 14 weeks before desired planting time into a commercial peat-vermiculite growing mix. Sow two seeds 3/4-inch deep in small pots or in cell trays with cells about 2 by 2 inches. Germinate seeds at 75° to 85°F, then grow the transplants at 70° to 75°F during the day and 65°F at night. Thin to one plant per pot or cell after emergence.

Transplants should be grown in full sunlight. Apply soluble fertilizer such as 20-20-20 at about half the rate recommended on the label in weeks 4, 8, and 12 after sowing. Do not overfertilize.

Transplants should be planted in the field in the bottom of a 6-inch deep furrow. The furrow should be gradually filled in as plants grow in height and vigor. If a crop is established from transplants, allow two growing seasons before harvesting any spears.

Pest Management

Try to select fields that have never had asparagus in order to help reduce pest pressure. Although asparagus may have fewer pest problems than some other vegetable crops, there may be pests that could reduce yields or quality. Refer to a current revision of Extension Bulletin 236, "Commercial Vegetable Production Recommendations" for the most recent information on pesticide recommendations.

Weeds

Try to avoid planting into fields with known weed infestations that could be difficult to control. Heavy mulches of organic materials will help suppress growth of some weeds.

If growers choose to use herbicides, there are several choices of herbicide programs available for asparagus. Before deciding on an herbicide program, first identify the weeds in each field and then select materials that control those weed species. EB 236 contains a table titled "Herbicide Effectiveness on Major Weeds in Vegetables" that can be used as a guide for selecting the best herbicides. Listed below are typical weed control programs for many annual grasses and broadleaf weeds.

For seedbeds for crown production:

Select a clean field free from weeds.

- After planting, apply Roundup Ultra 4SC according to labeled rate or Gramoxone Extra 2.5SC at 1.6 pints per acre to control emerged weeds. Do not apply if asparagus fern growth has emerged.
- After fern emergence, apply 0.5 to 0.75 pints per acre of Fusilade DX 2E plus oil concentrate, or 1 to 2.5 pints per acre of Poast 1.5EC with oil concentrate. Both materials give good control of grasses but are weak on broadleaf weeds.

For cutting beds before spear emergence and/or after harvest season:

Start with a field that is as clean as possible from the previous year's production. The following herbicide programs may be used. Select a combination of chemicals that will provide adequate control of both broadleaf weeds and grasses.

- Apply 1 to 2.5 pounds per acre of Karmex 80DF before spear emergence or after harvest when soil is disked and free of weeds. Karmex primarily controls broadleaf weeds but can be tank mixed with Devrinol to control annual grasses as well.
- Apply 1.5 pounds per acre of Sinbar 80WP prior to spear emergence or after harvest. Sinbar gives fair control of annual grasses and good control of some broadleaf weeds, but it is weak on pigweed. Do not use on soils with less than 1% of organic matter.
- Apply 1.33 pounds per acre of Sencor 75DF or Lexone 75DF before spear emergence or after harvest. These are primarily effective on broadleaf weeds but can be tank mixed with Devrinol to control annual grasses.
- Apply 8 pounds of Devrinol 50DF per acre before weeds emerge in the spring. This application can be split and applied at 4 pounds per acre in early spring and 4 pounds immediately after cutting. Devrinol primarily controls annual grasses.
- Apply 2.5 to 5 pounds per acre of Solicam 80DF at the end of the cutting season. Solicam primarily controls grasses and suppresses yellow nutsedge, but it can be combined with Karmex or Sencore/Lexone to give control of a broader spectrum of weeds.
- Apply 0.2 to 0.5 pounds per acre of Poast 1.5EC with oil concentrate. Keep in mind that the use of oil concentrate may increase the risk of crop injury under hot or humid conditions.
- Heavy applications of organic mulches and hand weeding can also be used as a nonchemical method of suppressing weed growth.

Postemergence:

Apply 0.5 to 0.75 pints per acre of Fusilade DX 2E plus oil concentrate or a nonionic surfactant to control annual grasses and some perennial grasses. Broadleaf weeds will not be controlled.

- Apply 0.5 to 0.66 pints per acre of Stinger 3A to control or suppress some annual and perennial

broadleaf weeds including Canada thistle, goldenrod, mugwort, and wild aster. Some deformation of treated spears may occur.

- Apply Roundup Ultra 4SC as a spot treatment using a directed spray or shielded equipment immediately after the last harvest when all spears have been removed or after fern has developed. See the label for rates and optimum application period.
- Apply 1 to 2 quarts per acre of Formula 40, a 2,4-D material. Apply after a close harvest when weeds have considerable foliage. This controls many broadleaf weeds but is not effective on grasses.

Insects

Monitor the populations of insects that may damage the asparagus. If insecticides are to be used, select from those listed in Table 1.

Table 1. Insecticides for asparagus

Pest	Description and damage	Insecticide[a]	Remarks
Asparagus beetle	Adult beetles lay eggs on new asparagus tips, reducing quality appearance of spears. Both adult beetles and larva feed on fully developed plants, reducing overall yield.	Malathion (1), or Lannate (1), or Methoxychlor (3), or Ambush (3), or Pounce (3), or Sevin (1).	Apply when needed during the cutting season and late summer. Clean cut the field at last harvest to eliminate beetle eggs.
Cutworms	Worms chew off emerging asparagus tips. Early spears are the most heavily damaged because they are the first ones up and the slowest growing.	Sevin 5% bait (1) or Lannate (1), or Ambush (3), or Pounce (3).	Apply when damage to cutting fields is severe.
Asparagus aphid	Look for tiny ($^1/_{16}$-inch long) bluish-green aphids on ferns.	Malathion (1).	Control is important on young cutting beds.
Asparagus fern caterpillar	Feeds on fern growth.	Lannate (1).	Also known as beet armyworm.
Japanese beetle	Feeds on fern growth.	Ambush (1), or Pounce (1).	Apply to foliage after cutting season.

[a] The number enclosed in paranthesies indicates the number of days to wait inbetween the last application and harvest

Diseases

Much of the disease control program for asparagus occurs through cultural practices for the crop. For reduction of potential losses from fusarium root rot for both crown production and for production fields, select well-drained fields that have never had asparagus grown on them. Use disease-free crowns of varieties with genetic resistance.

Phytophthora problems are more likely to occur in low areas and areas with poor drainage, so these should be avoided if possible. However, Ridomil Gold 4E can be applied at 1 pint per acre to reduce phytophthora losses. Apply 30 to 60 days before harvest and make a second application just before harvest.

Burn brush in winter where permitted to destroy overwintering spores of the fungus that causes purple spot. Fungicide application for purple spot is not practical

Asparagus can be treated with fungicides to reduce injury from rust, another fungal disease. Use 2 pounds 80WP per acre of mancozeb (sold as Dithane M-45, Manzate 200, and Penncozeb). Begin sprays during mid-August when the disease usually develops, but check fields frequently earlier in the season and begin applications in late June if necessary. Repeat 3 to 4 times at 7- to 10-day intervals. Mancozeb may be needed on rust-resistant varieties in fields that are 1 to 2 years old.

Harvesting

Asparagus established from crowns should not be harvested the year of planting or the following year. This allows crowns to develop and ensures a good harvest later. During the first year of harvest, spears can be harvested for a 2-week period. The next year's harvest is usually about 4 weeks, then in subsequent years harvest for about 6 weeks. As a general rule, stop harvesting the asparagus June 15 if fern vigor was good the previous fall. If fern vigor was low or foliar diseases were severe, stop harvesting about 10 days earlier than usual to allow the ferns to develop to maintain maximum crown vigor.

Harvest spears that are 8 to 10 inches in height before leaf scales around the spear tips open. Spears are most tender and succulent at this time. Spears can be snapped off at ground level by hand, but using a cutting knife to cut the spears slightly below the soil surface gives a larger spear and doesn't leave "stubs" at the surface to interfere with subsequent harvests.

Asparagus yields vary depending on spacing between plants and rows, fertility, vigor of plants the previous year, and in response to environmental conditions. The yields of the New Jersey hybrid varieties have averaged about 4,000 to 7,000 pounds per acre in Maryland.

After the harvest has ended for the year, leave the remaining spears in the beds to grow into ferns which will produce carbohydrates for crown development and subsequent growth.

Brush Removal

In areas where open burning is permitted, burn brush during the winter to destroy overwintering insects and spores of diseases such as rust and purple spot. Otherwise, mow the brush and disk the residue in February or March. Use shallow disking to avoid damage to spear buds, especially in older fields whose crowns are closer to the surface.

Marketing Asparagus

In cool weather asparagus can be harvested every two to three days, while in hot weather asparagus must be harvested daily. The amount of labor needed to hand harvest and grade asparagus is estimated to be about 7 to 8 hours per acre. Asparagus also lends itself to pick-your-own operations, especially for growers who offer strawberries and peas. Roadside stands and farmers' markets also serve as market outlets for asparagus growers.

If the asparagus crop is to be sold at roadside stands or farmers' markets, grade the spears to uniform size and length. Refrigerate harvested spears at a temperature of approximately 35° to 45°F with a relative humidity of 90% to 95% if possible. Spears must be held in a vertical position to avoid upward curling of the tips that would reduce value. Asparagus will store well for up to a week, but a loss of quality will be noticed by the end of a second week of storage. Encourage your customers to store asparagus spears in a cool place and use them as soon as possible.

Costs and Returns

There will be considerable cost in purchasing crowns and establishing an asparagus planting. Since asparagus should not be harvested the first two years and for only a short time during the third year, there will be little income until the fourth year and later.

Yield and Price Assumptions

		Price/lb		
Yield		$ .75	$1.00	$1.25
Good	4,000 pounds	$3,000	$4,000	$5,000
Better	5,500 pounds	4,125	5,500	6,875
Best	7,000 pounds	5,250	7,000	8,750

Estimated Cash Cost Per Acre[a]

Establishment Costs--first year only	
Crowns (10,000 x $150 per 1,000) =	$ 1,500.00
Lime (2 tons x 26.00) =	52.00
Fertilizer (500 lb 10-20-20) =	70.00
Labor (50 hours x 7.50) =	375.00
Total =	$ 1,997.00
Annual Costs--during production years	
Fertilizer (750 lb 10-20-20) =	$ 105.00
Herbicide	
(2 qt Roundup x 11.25) =	22.50
(8 lb Devrinol x 9.50) =	76.00
Insecticides	
(Lannate-3 sprays x 3 pt x 7.25) =	65.25
Harvest labor (120 hours x 7.50) =	900.00
Fuel and Oil =	20.00
Total =	$ 1,188.75

[a] Cash costs only. Charges for labor, grading, packaging, marketing, and fixed costs on land and equipment need to be added.

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