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## **SPECIALTY CROP PROFILE: ASPARAGUS**

Tony Bratsch, Extension Specialist, Virginia Tech

**Introduction:** Asparagus, *Asparagus officinalis*, is a hardy perennial vegetable belonging to the Lily Family. It is grown for its succulent early spring vegetative shoots that originate from an underground crown. A native of coastal Europe, asparagus has naturalized over much of the eastern United States. With the assistance of man and birds that have spread the seeds, asparagus can be found in gardens, old homesteads, fence-rows, roadsides and railroad right of ways across the state. It is well adapted to most areas of the state, preferring well-drained loam soils and easily tolerating winter cold and summer heat. Asparagus is long lived, and a well-managed planting can last 10-15 years. For those considering it as a potential crop, good planning and soil preparation is essential for long-term success.

**Market Potential:** Depending on location and spring soil warming characteristics, asparagus shoots will begin emergence in late March to early April. In a mature planting, the harvest/market window will continue for 6 to 8 weeks. For direct marketing, asparagus can be a strong opening season crop, with some overlap with strawberries and early-planted cole and leafy green crops. Usually asparagus is sold by the bunch (1lb), or in 25lb. crates for bulk or wholesale deliveries. Expect to receive at least twice the price for retail product versus wholesale. Depending on the direct market venue, retail prices usually range from \$1.50-4.00 per pound. Mature plantings can yield on average 3000-4000 pounds/acre each year. Growers should consider the initial cost of establishment, with the cost of plants a primary factor, along with the time it takes for the planting to reach full production (4-5 years), and the annual maintenance costs. A budget for asparagus can be found in "Selected Costs and Returns Budgets for Horticultural Food Crops Production/Marketing" VCE Publication # 438-898. To ensure a quality product, harvests must be made regularly (daily, depending on weather), and availability of labor is an important consideration.

Cultivars: Botanically asparagus is dioecious, meaning there are male and female plants. In older cultivars, typical male/female ratio in a given seed lot is about 50/50. Female plants produce more spears than males, but also drop seeds that can sprout and create overcrowding conditions in the rows or between rows. Seed production also decreases female spear diameter/yield. Recent research and hybridization has brought a new generation of all male cultivars that have been bred for disease resistance (Asparagus rust, Fusarium) and higher yields. All male plants produce thicker, larger and more uniform spears, lack the seedling weed problem, and yield 2-3 times more than standard varieties.

**Suggestions:** Jersey "Super Male" Hybrids (all with good rust and fusarium resistance):

- Coastal and Southern Piedmont: 'Jersey Knight', 'Supreme'
- Upper Piedmont and Mountains: 'Jersey General', 'Knight', 'King'

Synthetic varieties: Syn 4-56, Syn 53. Similar to Jersey hybrids.

'Martha', 'Mary Washington', - The old standards, average rust resistant, M/F.

'Purple Passion': Novelty type, sweeter, purple color, M/F.

Site Selection and Preparation: As a long-term perennial crop of considerable cost to establish, particular attention should be paid to site selection and pre-plant soil preparation. Select a well-drained planting site, with full exposure, and one that has never had asparagus on it. Even with resistant cultivars, re-plant of older sites should be avoided or at least delayed for 5-6 years to reduce risk of Fusarium and also Phytophthora crown rot diseases. Avoid light, sandy soils, as grains of sand can be difficult to clean from the spears. Rocky soils and very windy sites should be avoided, as both can cause crooked or bent spears. The site should allow for good cold air drainage to reduce frost damage in the early spring.

As asparagus can root deeply, it is important that an assessment of seasonal water table level be conducted over the course of a year before planting. This can be done by digging a 4-5' deep pit, and monitoring water accumulation and holding depth. Sites with seasonal (winter) water tables reaching closer than 4' from the surface should be avoided. Also during the year prior to planting, perennial weeds should be identified in the site and eradicated using translocated herbicides such as glyphosphate (Round-up ). Depending on initial soil test, additional P and K may be needed, both should be amended to 'high' test levels before planting. Asparagus prefers a high soil pH and lime may be needed to bring soil pH to 6.5-7.0. This too should be done well in advance of planting. All pre-plant amendments should be incorporated and worked in deeply.

Establishing the Planting: Planting should be done between April 1 and May 30. In addition to pre-plant adjustments, a starter fertilizer (500lbs 10-10-10 /acre or 50lbs nitrogen/acre) should be applied over the rows and tilled in. It is recommended that one-year-old vegetative crowns be used for planting, which can be grown from seed in a

seedling bed the year prior or purchased from a reputable nursery. Asparagus can be established from greenhouse grown seedling transplants in cell trays, but time to first harvest is delayed by one season, and this method may not be economical or practical for smaller plantings. Asparagus is planted deeply as compared to other crops. Usually row trenches are formed that are 5-6 feet apart, and 5-8 inches deep. An additional banded application of phosphate only or slow-release rock phosphate fertilizer should be made on the trench bottom, at a rate of 50lbsP/acre. This will not hurt the newly set crowns, and provides additional long-term phosphorus for the life of the planting. Place crowns in the trench 18-24" apart. Cover and firm with 2-3 inches of soil, and irrigate the area if rainfall is lacking. Over the course of the first season, gradually fill the trench until it is level, and irrigate during drought periods. Do not cut any emerging spears during the first year.

Harvest: Each spring spears will emerge from buds on the crown (Fig. 1), which were formed the previous season. The year after planting a light harvest is possible for about 2-3 weeks. Take only spears larger than a pencil, and allow others to grow. During the third season, harvest for 4-6 weeks, and in following years 6-8 weeks or until the majority (3/4) of spears coming up are less than 3/8" diameter. Morning is the best time to harvest. Air temperatures dictate frequency of harvest, and under warm conditions twice daily may be necessary. Any frost-damaged spears should be cut and discarded, as well as small, bent or otherwise unmarketable spears.

Non-marketable or missed spears should not be allowed to grow out while harvest is in progress (i.e. keep field "clean-cut"). Spears should be harvested at 9-10" long, and cut just below the surface, or snapped at ground level. With snapping, the fibrous base is left. Both methods are acceptable. All spears should be trimmed to a uniform length prior to sale, washed clean of soil particles, and bunched. Bunched spears should always be kept in an upright position, or tips will turn upward (Fig.2). For direct marketing, bunched spears can be set in a tray of shallow water, with the butt-end immersed. Fresh asparagus can be held for about 7-10 days in cooler at 33-36F, keep bases moist, humidity high.

Notes on Seasonal Culture: If not immediately harvested, emerging asparagus spears will quickly begin to branch and form a broad, open canopy of fine-textured "fern" growth. Following the harvest period, the seasonal care of ferns should not be neglected, as the fern growth will determine next year's crop. After the last cutting, fertilize with 50-75lbs nitrogen/acre. This can be split with an early application before spears emerge, or in the late fall.

Because of the deep rooting of asparagus, supplemental watering is usually not needed in an established planting. However it is important for the year of establishment, and if drought is supplemented during the first 2-4 years, size of spears may be improved. There is little benefit to irrigating fields during the harvest period.

Control weeds by mulching, hoeing or use of registered herbicides on established beds. Given the range of materials registered, a weed free planting is possible (Fig.3). Both post and pre-emergence herbicides are available for asparagus, and total rates can be split

between two applications for season-long control. Weeds can be partially managed by light tillage (1-2") when spears are not present, such as the very early spring before spears emerge, just after the last clean-cut harvest, or in the late fall when tops die down. This light tillage can also be used to incorporate pre-emergence herbicides and supplementary fertilizer. Care should be taken to adjust tillage equipment depth to avoid damage to crowns. In older plantings, determination of crown location/depth should be made, as crowns tend to "rise" in position over time.

Scout for Asparagus Beetle and potential rust development on ferns, and spray as necessary with approved insecticides and fungicides. During harvest watch for cutworm damage (distorted growth angle), and the laying of Asparagus Beetle eggs on emerging spears, which are difficult to remove, and make the spears unmarketable. A complete list of pesticides and use recommendations can be found in the Commercial Vegetable Production Recommendations, VCE Publication #456-420

Following frost in the fall, dead ferns can be left on or off during winter. If there has been difficulty with Asparagus Beetle, removal of ferns is advised, and mowing, followed by light tillage over the rows can be done to destroy over-wintering habitat.



Figure 1: Quickly emerging asparagus



Figure 2: Asparagus bunched and stored upright for market



Figure 3. Weed free and well-managed asparagus field on the James River

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