VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the Purdue University Cooperative Extension Service

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<http://www.entm.purdue.edu/entomology/ext/targets/newslett.htm>

IN THIS ISSUE

DEVELOPING A SAMPLING PROGRAM FOR INSECT PESTS ON VEGETABLES AND MELONS - (*Frankie Lam*) - Sampling is the cornerstone of integrated pest management because a management program requires current status of the pest to make decisions on managing activities. An unbiased sampling method may estimate the insect population accurately and lead to decision making that would manage the pests effectively. In designing a sampling program for major pests of the crop is an essential step in insect management.

For scouting insects on vegetables and melons, we usually recommend sampling randomly 10 locations for each 20-acre field in a "Z" pattern and sample 5-10 plants at each location. To get a clear idea of insect population, we also suggested that the selected locations should be distributed evenly in the field. Designing a sampling procedure for the field, we should consider the following outlines:

1. All sampling units of the field
   a. Should have an equal chance of selection for sampling.
   b. Must remain the same through the season.
   c. Should be stable and easily delineated in the field.
   d. Should give the estimated insect number either per plant or per unit area.
   e. Should provide a reasonable balance between cost and precision.
2. Avoid sampling on the edges of the field because most insects, such as cucumber beetles and common stalk borer, are likely to be present on the field edges.

However, this spring I discussed the sampling method for insects with growers, I realized that the recommendation, which we suggested for insect sampling, may not satisfy all the conditions mentioned in the previous paragraph. No matter how we rotate the pattern of the sampling methods, certain areas in the field will never be sampled.

To explain this idea simply, I used a rectangle with 20-squares to represent a 20-acre field. Each small square within a 1-acre area (large square) is about 210 square feet. Based on the criteria we recommended and including the rotation of the sampling pattern, we would have four methods of sampling (Figure 1). Two sampling

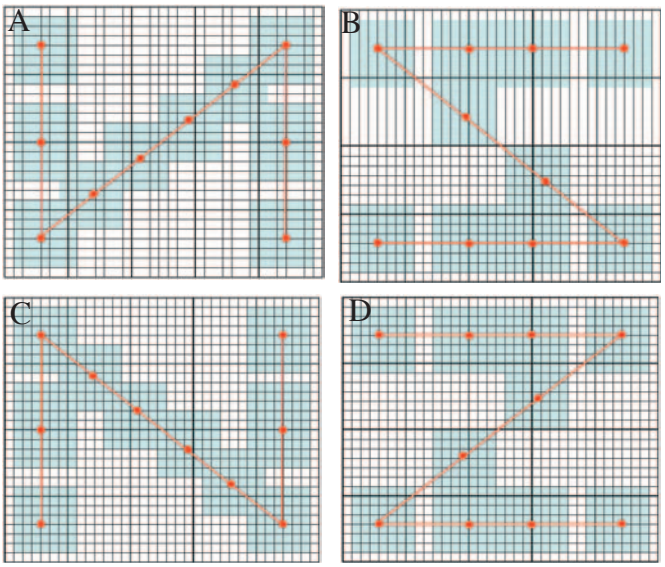

Figure 1. Four methods for sampling a 20-acre field at 10 locations in a "Z" pattern.

methods have six locations on the diagonal, whereas the other two methods have four locations on the diagonal. The red spots in each figure represent the locations that are distributed evenly in the field for sampling. The 5-10 plants that are scouted might be randomly selected within the blue area (1-acre). We may use any of these methods or rotate the methods in any kind of arrangement in scouting. Moreover, no matter which method or methods we used, some areas in the field will never be scouted. In Figure 2 the blue areas are the total scouted areas of the four sampling methods, while the white areas are those areas that will never be scouted by using

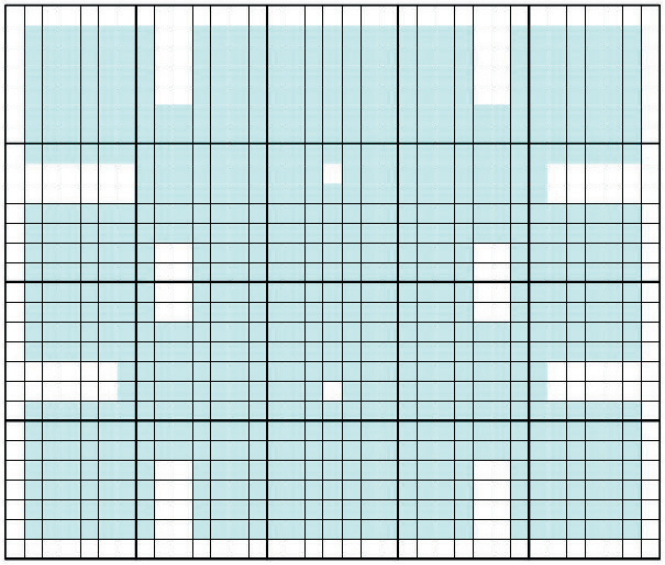

Figure 2. Total areas sampled (blue) by the four sampling methods.

these methods. Besides the border rows, certain areas inside the field end up never getting sampled.

To improve the sampling recommendation so that all areas in the field have an equal chance of selection for sampling, I suggested the following procedures (Figure 3):

1. Mark each 1-acre area of a 20-acre field in a "checker" pattern.
2. Number the areas from 1 to 20 accordingly.
3. Sample the odd number areas (green) on the first sampling date and sample the even number areas (blue) on the next sampling date. Repeat this cycle for the following sampling dates.
4. The 5-10 plants selected for scouting should be located within the same area.
5. For those areas that are located on the field edges, border rows should not be sampled.

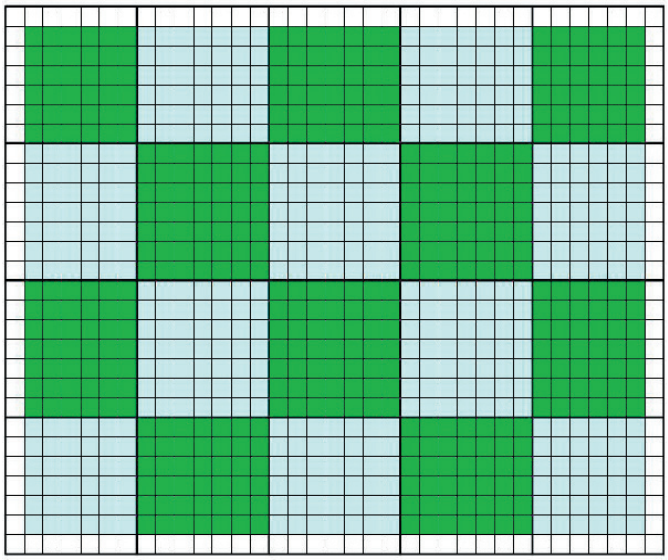

Figure 3. Mark each 1-acre of the field in a "checker" pattern and sample the alternated areas (green or blue) on each sampling date.

Although traveling through the field and scouting insects is time-consuming, labor-intensive, and difficult, using sampling information for management decisions on pests is an important factor for sustainable agriculture in avoiding excess applications of pesticides. Furthermore, we should estimate the cost of sampling and associated crop losses and savings in programs, with and without a sampling procedure, when developing a sampling method for management. If you need help to design a sampling program for pest management or to estimating the cost of sampling, please feel free to contact me at the Southwest Purdue Agricultural Center, (812) 886-0198.

Onion Thrips - (*Rick Foster)* - Over the winter I have had several inquiries about management of onion thrips on onions. Along with onion maggot, thrips are one of the most important insect pests of onions. They feed by rupturing cells and consuming the contents. This feeding damage reduces the photosynthetic ability of the plant, resulting in reduced bulb size. The feeding wounds and the thrips feces can result in increased levels of some fungal and bacterial diseases. However, thrips are not likely to increase levels of foliar diseases such as purple blotch. Thrips will also continue to feed on bulbs in storage, which may cause shrinkage and increase the amount of storage rot.

Although there are some natural enemies that feed on onion thrips, they are unlikely to provide the necessary level of control. Heavy rains can wash thrips off the plants. Overhead irrigation can produce the same effect. There are some differences in resistance of onion cultivars to thrips. In addition, some cultivars can tolerate thrips feeding more than others. Red onions tend to be particularly sensitive to thrip damage.

Start scouting for thrips about mid-June. Be sure to pull several plants apart to find the thrips that are hiding within the neck of the plant. If you have more than about 3 thrips per leaf, insecticide treatment is justified. To achieve satisfactory control with insecticides, thorough coverage is essential, because the thrips will often be within the protected area at the base of the neck of the plant. Nozzles should be directed at the neck from immediately above the plant. Higher gallonages and pressure should be used to push the insecticide to the inside of the canopy. The use of stickers and tank mixing with fungicides may reduce the efficacy of the insecticide application. Wetting agents may help the insecticide to flow down into the plant canopy better.

Currently, the only classes of insecticides labeled for use on onions are pyrethroids (Warrior, Mustang, Ammo, Decis, Pounce, and Ambush), carbamates (Lannate), and organophosphates (Penncap-M). In many areas, thrips are resistant to organophosphates. If control has been a problem with the pyrethroids, alternating sprays with Lannate may provide improved control and

help to delay the onset of resistance. There are several new classes of insecticides that may soon be available for use on onions to control thrips.

Onion thrips are also a significant problem on cabbage. Thrips can feed several layers down into the head. Control recommendations are similar to those in onions, except that SpinTor is also labeled for use in cabbage and has provided good control.

Kudzu Turning Over New Leaves in Indiana Counties - *(Steve Leer)* - A leafy plant blanketing much of the South is slowly pulling the covers over Indiana. Kudzu, known for its green quilt-like growth pattern, has been confirmed in more than 20 Indiana counties (Figure 1). The invasive plant species poses risks to both soybean growers and the forestry industry, said Glenn Nice, Purdue Extension weed scientist.

Figure 1. Kudzu plant. *(Photo by Chris Parker)*

"At the moment, there are over 52 kudzu sites in Indiana," Nice said. "The sites are mostly in the southern part of the state, with one site as far north as LaPorte County."

Nice and Purdue Extension plant pathologists Greg Shaner and Steve Hallett recently visited Indiana kudzu sites, to learn more about the plant that has attained near celebrity status below the Mason-Dixon line.

"Kudzu is a very aggressive plant that, once it gets a hold somewhere, is very difficult to get rid of," Nice said. "It essentially blankets any plants in its path. It forms vines that climb trees. In forestry agriculture kudzu can be a real problem. Trees covered by kudzu can die from lack of sunlight or stress caused by the weight of the vines, Nice said.

Another concern is kudzu's connection to soybeans. Because it is a legume like the soybean plant, kudzu serves as an alternate host for Asian soybean rust, a devastating crop disease first detected in the continental United States this past November. The disease spread as far north as Missouri and Tennessee.

Kudzu's dense leaf area provides an ideal breeding ground for future soybean rust infection. The fungal pathogen produces spores that can be picked up by the wind and carried to other locations. So far this year, soybean rust spores have been found on kudzu leaves in three Florida counties.

Soybean rust needs living leaf tissue in order to reproduce and spread. Leaves on Indiana kudzu fall off in the winter, making it unlikely that Hoosier kudzu could host rust during the winter, Nice said. Kudzu in Dubois County was beginning to bud earlier this month, he said.

While soybean rust probably could not survive an Indiana winter, Hoosier kudzu could help launch new generations of rust spores during the soybean-growing season, Nice said.

"The general belief is that soybean rust will come up from the south, and it has to come up from the south because it cannot overwinter in Indiana," he said. "If soybean rust makes it into the state kudzu may pose a problem, in that rust also will infect kudzu here in Indiana. Kudzu could be a point of inoculum for further infection."

Kudzu can be controlled, but it isn't easy. Mature kudzu plants are the hardest to eliminate, Nice said.

"Certain herbicides work on this plant," he said. "Glyphosate tends to have activity, as does triclopyr and a few of the growth regulators for woody plants.

"However, the older a kudzu colony gets, the more difficult it is to control. Colonies that are over nine years old become almost impossible to control. The reason for this is that kudzu develops these incredible underground root structures. They dig deep and are dug in well enough to survive anything we try to do to them."

The Purdue kudzu research team and the Indiana Department of Natural Resources continue to monitor kudzu. A map of counties with confirmed and suspected kudzu sites is available (Figure 2). For more information and updates of kudzu locations check the Purdue Plant and Pest Diagnostic Laboratory's soybean rust Web site <www.ppdl.purdue.edu/ppdl/SBR/SBR_hosts.htm> and scroll to the bottom of the page.

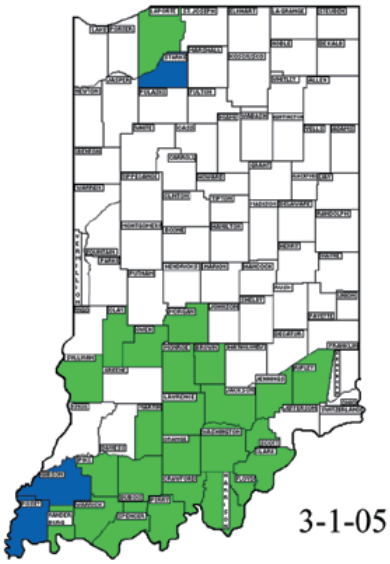

Figure 2. Kudzu locations in Indiana include 25 counties with 73 sites totaling 69.44 acres.

For more information about kudzu, read Purdue Extension publication BP-69-W, "Kudzu in Indiana," by Nice, Purdue weed scientists Tom Bauman and Bill Johnson, and Peggy Sellers, coordinator of Purdue's Master Gardener Program. The article can be downloaded online at <www.btny.purdue.edu/weedscience/2004/articles/Kudzu3-8-04.pdf>.

Wireworm Damage on Potato - (*Frankie Lam*) - Wireworm damage on potato was found in southern Indiana during mid-April (Fig. 1). Wireworms are the larvae of many species of click beetles. The worms vary in size from ½ to 1 ½ inch when fully grown, whereas most adult click beetles range from ½ to 1 inch in length.

Fig. 1. Wireworms feeding on potato seed-piece. *(Photo by Frankie Lam)*

Wireworms are slender, jointed, usually hard-shelled, and tan to dark brown in color. Wireworms are named after their long, wire-like appearance. The larvae have chewing mouthparts and three pairs of legs (Fig. 2). Wireworms and click beetles overwinter in soil about 9 to 24 inches deep. During spring and soil temperature reaches 50 to 60°F, the insects move nearer the soil surface and feed on seeds, seedlings, tubers, and roots

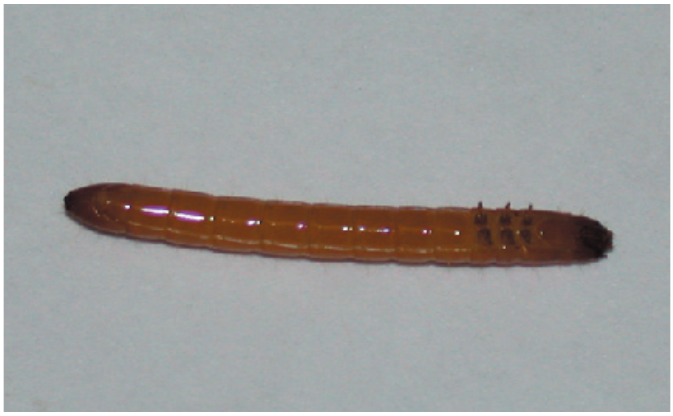

Fig. 2. A wireworm (showing ventral side on top) has three pairs of legs on the thorax behind the head. *(Photo by Frankie Lam)*

within 6-inch of soil surface. When soil temperatures become hot (>80°F) or dry, wireworms will move deeper into the soil and seek for cooler conditions. That is the reason why wireworm problems seldom occur during hot summer.

Wireworms take two to six years to complete the life history, depending on species. For most species, all life stages remain in the same area where they hatched, so multiple generations and stages could be found in one location. Adults are known as click beetles because of their behavior of clicking when placed on their backs. The adult beetle is slender and elongate, with the body tapers from the head to the tip of the abdomen (Fig. 3). The adults feed on different vegetation, but do not cause economic damage on crops.

Fig. 3. Click beetle. *(Photo by Frankie Lam)*

Wireworms damage potato and sweet potato by feeding primarily on tubers. The damage appears as small holes with tunnels (Fig. 4). In early spring wireworms may drill into seed tubers or seed-pieces, weakening the tubers and probably resulting in the

Fig. 4. Wireworm damage on potato tuber. *(Photo by Frankie Lam)*

secondary infection, such as soft rot (Fig. 5). During late season, their feeding on tubers will cause feeding scars or tunnels, which result in reduced quality of harvested tubers.

Wireworm problems will likely be continued if a susceptible crop is planted in the field with a history of wireworms. Usually wireworms cannot be controlled

Fig. 5. Secondary infection of soft rot on potato tuber fed by wireworms. *(Photo by Frankie Lam)*

simply by crop rotation; however, the following practices are known to control certain species in various parts of the country:

- Clean summer fallowing or resting of land every second or third year.
- Shallow plowing to prevent the growth of all vegetation and the deep penetration of wireworms into the soil.
- Do not rotate the field with hay or grain crops.
- Increase soil drainage to control those species, which thrive in poorly drained soil.
- Cultivation in autumn or in early spring to expose larvae to freezing temperatures and predators
- Plant the crop when the soil is warm.
- Rotate the field with non-susceptible crops, such as alfalfa, lettuce, sunflowers, and buckwheat.

The decision to use insecticides for wireworm management must be made prior to planting. Bait traps should be set 1-4 weeks before planting crops in field with wireworm history. Please read the article, *Wireworm damage on Vegetables and Melons*, in Vegetable Crops Hotline No. **446** (April 8, 2005) on setting bait traps in field. An average of 2-4 wireworms per trap, the risk of economic damage to potato is considered very high and the application of soil insecticide at planting is often recommended. Imidacloprid (Admire) and Thiamethoxam (Cruiser) are labeled for seed-piece protection of potato. Please read the label carefully before the application of insecticides.

Disease Migrations - *(Dan Egel)* - Perhaps no plant disease in recent Hoosier history has gotten more press than Asian soybean rust. While all the publicity will help soybean growers be prepared for the possible arrival of this disease, I have noticed some confusion as well.

Asian soybean rust will overwinter in the south and move north each summer. This follows a pattern for a few other diseases that do not survive except on green tissue. However, most diseases that affect vegetable diseases in Indiana do not follow this pattern. In this article, I would like to describe, in general terms, the various ways in which diseases survive and move.

Plant diseases can be broadly categorized as residue borne, soil borne or tissue survivors. Since Asian soybean rust has gotten so much publicity recently, let's talk about tissue survivors first.

Diseases that require green tissue in order to survive include Asian soybean rust, cucurbit downy mildew and tobacco blue mold. All of these diseases will survive on growing plant hosts in the southern US during the winter months. As warm weather in the spring causes the US to green up from the south to the north, the hosts that these diseases need to survive will start to actively grow. As the hosts become active, the above diseases can begin to move north depending on wind currents and weather. The progress of all these diseases can be monitored from this website <www.ces.ncsu.edu/depts/pp/soybeanrust/index.php>.

Diseases that require green tissue to survive will not cause disease every year in Indiana. For example, cucurbit downy mildew does not always cause a problem for Indiana growers. Nevertheless, it is a disease for which growers must be prepared. Likewise, no one knows whether or when Asian soybean rust will arrive in Indiana this season.

Many vegetable crops are affected by forms of the powdery mildew fungus. Although this disease requires green tissue to survive, a resilient structure may be formed that overwinters. Thus, powdery mildew may survive in crop residue or may blow in from the south in the summer. Powdery mildew, as for example on pumpkins, is present in Indiana every year.

A number of the diseases that plague vegetable growers each year are residue borne diseases. These diseases survive in the leaves, stem and fruit of the crop as it decays (residue). The disease causing fungus or bacteria will not survive long once the crop is completely decayed. This is the reason that crop rotation and fall tillage are important management techniques for these diseases. Note that many of these diseases are compared in the table on page 36 of the Midwest Vegetable Production Guide (2005) <www.entm.purdue.edu/entomology/ext/targets/ID/index.htm>.

Examples of these diseases include gummy stem blight of cucurbits, early blight of tomatoes, black rot of cabbage and bacterial spot of peppers. Such diseases do not move or migrate north every year as described above. The presence or severity of these diseases in the southern US will have no impact on how severe these diseases are in Indiana.

The third category of plant disease I will mention are those caused by soilborne fungi or bacteria. The organisms that cause these diseases survive for long periods even in the absence of any plant residue. Examples include Fusarium wilt of watermelon, root knot nematodes of a number of crops, Verticillium wilt of tomatoes

and Phytophthora blight of peppers. These diseases are not easily controlled by crop rotation and fall tillage due to the survival of the fungi or bacteria involved. Like the residue borne diseases discussed above, soilborne diseases do not move north with the spring.

There are other methods for diseases to move around the country. Insects can spread some diseases, like those caused by viruses. Some viral diseases, like those that affect cucurbits, overwinter in growing hosts and move north in the summer. This is why cucurbit viruses are more of a problem on late season pumpkins than in muskmelons that are early season crops.

Finally, some diseases can be moved around on seeds. Once established in a field, they might survive in a number of different ways. Examples would be gummy stem blight and Fusarium wilt of watermelon.

Any of the above diseases may be a 'plague on your house' this year. It may help to realize which diseases are already in the area and which you need a map to track.

Bean Leaf Beetle on Legume Vegetables - (*Frankie Lam*) - Bean leaf beetle adults were found in a soybean field on April 19 at Southwest Purdue Agricultural Center near Vincennes, IN. The soybean field was planted on March 31 and the stage was V1 on the sampling date. On an average 1.25 bean leaf beetles were observed on a 16-ft row of soybean. Although the number of beetles found on the plants was relatively low, it indicated that the beetles were wakening from their overwintering sites and moving to the field.

The bean leaf beetle adult has the wing cover color varies from yellow (Fig. 1) to red (Fig. 2). The adult beetle feeds on leaves and pods of leguminous plants,

Fig. 1. Bean leaf beetle (yellow phase). *(Photo by Frankie Lam)*

including beans, peas, and alfalfa. The adult is known to vector several viruses, including bean pod mottle virus, cowpea chlorotic mottle virus, cowpea mosaic virus, and southern bean mosaic virus. Symptoms of these viral diseases on soybean are similar, including curled margins, dark green enations (outgrowth produced by increase in number of cells abnormally), mosaic symptoms on leaves, reduced pod formation, delayed maturity, and discoloration of seeds. Not much study has been conducted on the impact of the pest complex, including the beetle and the viral diseases on legume vegetables. However, it was known that the earlier the virus transmitted onto the plants, the high the yield loss at harvest. Growers, with legume vegetables planted and emerged, should start to scout their crops for bean leaf beetles.

Fig. 2. Bean leaf beetle (red phase). *(Photo by Frankie*

The bean leaf beetle population numbers were relatively low in Indiana over the past several years. About the relative population numbers of bean leaf beetles in the 9 Indiana agricultural statistics districts, please read the article, *Seed-Applied Insecticide for Soybean* by John Obermeyer, Larry Bledsoe, and Christian Krupke, in Pest and Crop Newsletter on February 25, 2005 <www.entm.purdue.edu/Entomology/ext/targets/p&c/P&C2005/P&C1_2005.pdf>. The recommended economic threshold of bean leaf beetle on legume vegetables is 1 beetle per foot of row. Capture, Mustang, Sevin, and Warrior are labeled for the control of bean leaf beetles on beans and peas. Read the label carefully before applying insecticides.

Preparing for Asparagus Harvest and Grading - *(Liz Maynard)* - Asparagus is one of the first Indiana vegetables on the market. This article reviews harvest, grading and postharvest care recommendations to help you start the season with top quality asparagus.

Getting quality asparagus to market means making sure to pick good spears at the right time; grade according to your market requirements; and keep the spears cold, moist and upright.

Plan to harvest early in the morning when it is still cool. Spears to be sold should be tight at the tip, dark green, and at least 3/8 inch in diameter. During the harvest season the only spears left standing in the field should be those you expect to harvest in the future. Don't let unmarketable spears continue to grow and develop into fern. They can harbor diseases and insects, and also slow growth of new spears.

The grading of spears after harvest will depend on your market. The standards presented here give you something to measure your standards against, whether or not they are the standards your market requires. The best asparagus is fresh (not wilted), straight, dark green for most of the stalk length, and has a tight tip that is not spreading. The butt end is smooth and flat. The USDA has two grades, and the Washington and California Asparagus Commissions have criteria for minimum diameter and color. Table 1 below summarizes the USDA standards and Table 2 shows the various diameter classifications. According to USDA standards, minimum spear length may be specified to the nearest 1/2 inch, but is not required. Spears are typically 7 to 9 inches Washington specifications require that at least 85% of the stalk is green. California allows no more than 1.5 inches of white showing on a 9 inch spear (but up to 20% of spears in a box may have more than that amount of white). Both Washington and California have even more stringent color requirements for asparagus marketed as "all green."

Asparagus should be cooled as quickly as possible and kept cool. The optimum temperature range is 32°F to 35.6°F. To cool asparagus, it can be dunked in or showered with cold water. The water should be of drinking water quality and, if used more than once, changed regularly and disinfected using an approved material such as chlorine. The harvested spears remain alive and actively respiring until they are cooked or eaten. Respiration creates heat and burns up carbohydrates. Keeping the asparagus cool reduces the rate of respiration, which is essential for maintaining quality.

High relative humidity is also important for asparagus. The desired range is 95% to 100%. If asparagus will be stored in a cooler, it may be placed in plastic bags to maintain high humidity. The butt ends of spears should be kept moist. They may be set on a moist pad or in 1/2 inch of water.

Table 1. Asparagus Grading Criteria from USDA[1]

Characteristic	USDA No. 1	USDA No. 2
Diameter	≥1/2 in.	≥5/16 in.
Color	at least 2/3 of stalk is green	at least 1/2 of stalk is green
Trimming	2/3 of butt of stalk is trimmed parallel to container, butt is not stringy or frayed	1/3 of butt of stalk is trimmed parallel to container, butt is not badly stringy or frayed
Straightness	Stalk is fairly straight	Stalk is not badly misshapen
Freshness	Not limp or flabby	Not limp or flabby
Damage[2]	No damage	No damage
Decay	No decay	No decay

[1]Source: 1. USDA-AMS Fruit and Vegetable Division, Fresh Products Branch. 1966. United States Standards for Grades of Fresh Asparagus.
[2]Damage may be caused by spreading or broken tips, dirt, disease, insects, or other means.

Table 2. Asparagus Diameter Classes from USDA, Washington State Asparagus Commission, and California Agricultural Code [1,2]

USDA		WA		CA	
Very small	Less than 5/16 in.	Small	1/4 in. to 3/8 in.	Small	3/16 in. to 5/16 in.
Small	5/16 in. to less than 1/2 in.	Standard	3/8 in. and larger	Standard	5/16 in. and larger
Medium	1/2 in. to less than 11/16 in.	Large	7/16 in. and larger	Large	7/16 in. and larger
Large	11/16 in. to less than 7/8 in.			Extra large	5/8 in. and larger
Very Large	7/8 in. and larger	Jumbo	13/16 in. and larger	Jumbo	13/16 in. and larger
				Colossal	1 in. and larger

[1]Sources: 1. USDA-AMS Fruit and Vegetable Division, Fresh Products Branch. 1966. United States Standards for Grades of Fresh Asparagus. 2. Washington Asparagus Commission. 2005. Washington Asparagus Specifications. <www.washingtonasparagus.com/default.cfm?body=specifications.cfm> Accessed 2005 Apr 26. 3. California Asparagus Commission. 2002. Synopsis of California Agricultural Code Provisions for Packing Asparagus. <www.calasparagus.com/marketing/standards.htm> Accessed 2005 Apr 26.
[2]Diameter definitions: USDA 1 in. from the butt. CA: widest cross-section at largest point of stalk.

Improper storage conditions can lead to poor quality asparagus. Spears held horizontally for a period of time will bend upwards at the tips; it is best to hold spears standing up. Asparagus quickly gets tough if kept above 50°F. It will also get tough if exposed to ethylene gas. Ethylene may be produced by the asparagus itself if it is bruised, broken, or diseased. Low humidity will result in shriveling and weight loss. Asparagus will freeze at temperatures much below 31°F, becoming watersoaked and mushy when thawed.

Experienced asparagus producers probably have a good sense of how much the crop will grow under different weather conditions. For those with less experience, Table 3 may help guide decisions about when to harvest. Is it necessary to pick every day, or is it ok to skip a day? The warmer the weather, the faster the spears lengthen. The table shows how many inches a spear will grow each day, depending on its size and the average temperature. For example, with a high of 70 and a low of 50°F, the average temperature would be (70+50)/2=120/2=60°F. At an average temperature or 60°F, a 2" spear would grow 1.4 inches in one day, a 4" spear 2.0 inches, and a 6-inch spear 2.7 inches. After one day, the spears that started out at 6"would be ready to pick; after 2 days the 6" spears would probably be past picking stage at 11.4 inches, and after two days the 4" spears would be ready to pick at 8 inches.

Table 3. Spear Growth of Asparagus

Average Temp. °F	Size of Spear		
(High + Low) divided by 2	2"	4"	6"
	spear growth (inches per day)		
50	-	0.6	1.3
55	0.7	1.3	2.0
60	1.4	2.0	2.7
65	2.1	2.7	3.4
70	2.8	3.4	4.1

Adapted from: Table 1. Estimating Spear Growth of Asparagus. (Adapted from Carl J. Cantaluppi Jr. and Robert J. Precheur. 1993. Asparagus Production, Management and Marketing. Bull. 826. The Ohio State University, Columbus. p. 22.)

Second Year of New Agriculture Network Serving Organic and Transitioning Farmers - *(Liz Maynard)* - Four universities - Michigan State, Purdue, Illinois, and Iowa State - have joined resources to bring seasonal advice to field crop and vegetable growers interested in organic agriculture. Our on-line newsletter features crop updates from organic growers and articles from university specialists about a variety of practices and new findings useful for organic growers. The information serves those interested in transitioning to organic as well as those currently practicing low-input or organic agriculture.

The first issue of the New Agriculture Network for 2005 will be posted April 28 at: <www.ipm.msu.edu/new-ag.htm>. To receive e-mail announcements when future issues are posted, go the Web site above and follow instructions under the "Get notification..." link.

If you have topics you would like addressed in the newsletter, please submit them to: newagnet@msu.edu and we will do our best to develop articles for them. Indiana producers who would like to receive the newsletter by US mail may call (219) 785-5673.

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