

Crop Profile for Cantaloupes in Indiana

General Production Information



Indiana ranks fifth in the production of cantaloupes or "muskmelons." Although used interchangeably, a true cantaloupe has rough, warty skin, compared to a muskmelon's netted skin. Indiana produces melons when many of the southern states are completing their melon harvest and before melons in the north are ripe. This opportunity allows Indiana melon growers to fill a profitable marketing position.

This report describes cantaloupe production in Indiana and includes a survey of melon growers on their pest management practices.

The Midwest Melon

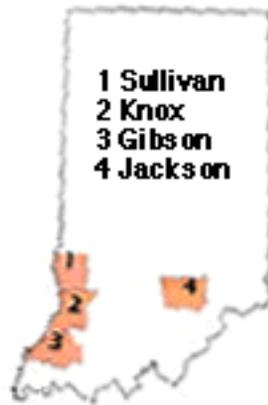
The ideal melon is round, weighs about seven pounds, and has deep sutures and sweet, orange flesh. Appearance and sweetness are important quality characteristics.

Melon Numbers

- Total acres planted: 3400* acres
- Average acres planted: 30 acres
- Range of acres planted: 10-400 acres
- Yield: 2500 melons/acre
- Yield (range): 1500-4000 melons/acre
- Value of melon production in Indiana: \$6,300,000*
- Annual production costs: \$/acre
- % of production cost that's pesticide: %
- * Five year average, 1992-1996. Indiana Ag Statistics Service.

Cantaloupe growing counties

The southwestern location gives growers access to markets in Chicago, Louisville, St. Louis, Ohio and Michigan.



The top four cantaloupe producing counties are shown above.
(Indiana Ag Statistic Service. 1992)

Production

Cantaloupes are a warm season crop. Optimum temperatures range from 65-75° F; with a minimum temperature of 60° F. Melons require ample soil moisture with good drainage. Many growers use drip irrigation to improve crop production. Southwest Indiana's sandy soils and climate make it well suited for producing cantaloupes.

Growers purchase seeds in January, which are planted in the greenhouse early to mid April. The seedlings grow in the green house four to five weeks before being hardened outside before planting. In the greenhouse, insect and weeds are a minimum concern. Of concern are *Pythium* and *Rhizoctonia* root and stem diseases. Also of concern are seed-transmitted diseases such as bacterial fruit blotch, anthracnose, and gummy stem blight.

Fertilizers, herbicides, soil insecticide and plastic mulch are applied to the fields in April before planting. Cantaloupes are sensitive to low soil pH so annual soil testing is advised. Herbicide applications are not required when black plastic is used. The black plastic blocks sunlight, which prevents weed growth. If clear plastic is used, herbicide will be applied prior to planting the seedlings. The clear plastic warms the soil and allows planting seven to ten days earlier.

At the two to five-leaf stage, greenhouse seedlings are transplanted in the fields beginning the last of April. Plantings may be staggered until the last of May to supply melons over a longer period. Seedlings are planted 2.5 to 4 feet apart in rows covered by plastic. Rows are spaced 6 to 8 feet apart. Approximately 1800 to 2400 melons are planted per acre.

Vines of adjacent plants within rows begin to touch by the end of May. Mid to late June vines begin to touch vines between rows. At this time no further cultivation is done.

Spraying begins in May for striped cucumber beetle and continues weekly when beetle populations are high. More information on the treatments used to combat striped cucumber beetles is listed in the Pest

and Pesticide section.

After vines between rows touch, growers begin fungicide applications. To be effective, most fungicides must be applied before infection occurs. Generally, growers apply fungicides on a regular schedule or based on climatic conditions suitable for infection. Spraying potential lasts from June to mid-August.

Growers apply most of their own pesticides. Pesticide applications that require worker re-entry intervals do cause significant financial difficulties for growers. To the extent, some growers have stopped raising cantaloupes. For example, powdery mildew usually infects the plants just before the handpicked harvest begins. A delay in harvest can result in lower prices received.

Melon harvest begins the first week of July and lasts four to six weeks. Melons picking takes place several times a week, sometimes daily. Cantaloupes are picked by hand at "full slip." Full slip occurs when the melon easily detaches from the vine. The melons are at their peak ripeness at this stage. The last harvest usually occurs in mid-August.

Prices received for the melons decline as harvest progresses. The first week of harvest prices received average \$1.00 per melon. By the fourth week, prices have dropped to \$0.60 per melon.

After harvest, at the end of August, vines are mowed. The plastic mulch is removed and the fields are disked.

Insect Pests

Striped Cucumber Beetle

photo by Richard Latin

The striped cucumber beetle serves as a vector for bacterial wilt.

Damaging stage: Adults are vectors for bacterial wilt; some minor larval damage.

Occurrence: Adults appear mid-April to mid-June.

Target: Adults feed on stems, leaves,



and cotyledons of young plants.

Thresholds: one beetle per plant
(when plants are young)

Yield loss: About 25% of plants die if no action is taken. Under poor management, 10% of the plants die; 2% die under well-managed fields.

Quality loss: Melons often look normal, but sugar content reduced because the wilted vines cannot transport sugars.

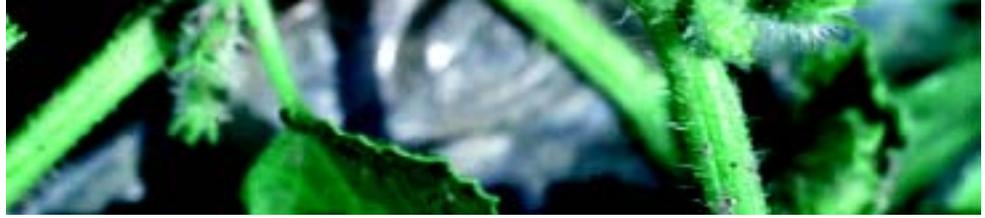


photo by Richard Latin

The disease rapidly attacks the plant. An entire plant can collapse and die within a few days. Losses from bacterial wilt coincide with the spring outbreak of cucumber beetles.



Pesticide control

Acres treated: 100%

Pesticide: Carbaryl

Common name: Sevin

Percent of acres treated: 50%

Rate (acre) 1 pound

Frequency: weekly for 7 weeks

Pesticide: Permethrin

Common name: Pounce, Ambush

Percent of acres treated: 30%

Rate (acre):

Frequency: weekly for 7 weeks

Pesticide: Esfenvalerate

Common name: Asana

Percent of acres treated: 10

Rate (acre):

Frequency: weekly for 7 weeks

Pesticide: Endosulfan
Common name: Thiodan
Percent of acres treated: 10%
Rate (acre):
Frequency: weekly for 7 weeks

Nonchemical control

Cultural practice: Plant after surge of early season beetles—usually in mid to late May.

Genetic alternative: None

IPM practices: Threshold is one beetle per plant. Beetles are active for 3 to 4 weeks, but it is generally compressed. Growers are advised to scout for beetles, which often reduces pesticide applications to 3 weeks instead of 7 weeks. Scouting tries to eliminate sprays after the initial surge of beetles. Only 1-3% of the beetles will carry the bacterium wilt organism. Beetles transmit bacterium wilt by defecating in holes chewed in stems or leaves.

IPM programs have reduced the use of pesticide to control striped cucumber beetle by 65%.

Seed corn maggot

Damaging stage: Larvae

Occurrence: Many generations, but problem with earlier generations.

Target: Root feeding and stem tunneling.

Thresholds: None

Yield loss: Up to 40% plants lost. If early in season can replant.

Quality loss: None; plants die.

Pesticide control

Acres treated: 50 to 75%

Pesticide: Carbofuran

Common name: Furadan

Percent of acres treated: 50 to 75%

Rate (acre): 2.5 fluid ounces per 1000 linear feet of row

Frequency: One application placed under the plastic before transplanting seedlings.

Nonchemical control

Cultural practices: Delay planting; but delayed planting affects market prices received. Using clear plastic warms the soil quickly, which stops egg laying by the adult maggot.

Genetic alternative: None

IPM practices: Delay planting as long as economically feasible. Typically when soil temperatures (at 4") above 21° no damage is expected. Preventative application.

Diseases

Alternaria Leaf Blight

Damaging Stage: Spores produced within lesions maybe dispersed throughout a field and can produce many new lesions leading to defoliation.

Occurrence: June 1 to end of season.

Target: Foliage but indirectly the fruit which ripens earlier because of the lack of nutrition.

Threshold: Initiate MELCAST after initial spray, which is when vines of adjacent plants within rows touch.

Yield loss: 60%

First picking is 7 to 10 days late with the number of melons greatly reduced through the third week of harvest.

Quality loss: Sugar content reduced; size and color alterations. Fruit that ripens prematurely are lower quality.

photo by Richard Latin

The *Alternaria* fungus (*Alternaria cucumerina*) only infects leaves. Lesions begin as small, tan or brown spots. Older lesions may be surrounded by a yellow ring. Greatest yield losses occur when the disease is established early in the season.



Pesticide control

Acres treated: 100%

Pesticide: Chlorothalonil
Common name: Bravo
and Terranil

Acres treated: 55%

Rates (acre): Liquid at 2 pints. Water dispersible granule at 2 pounds.

Applications: Nine applications 7 days apart. Or MELCAST at six to seven applications.

Pesticide: Mancozeb

Common name: Dithane, Manzate 200, Pencozeb

Acres treated: 35%

Rates (acre): 2 to 3 pounds

Frequency: nine applications at 7 days apart or MELCAST at six to seven applications.

Pesticide: Copper hydroxide

Common name: Kocide, Champ

Acres treated: 10%

Rate (acres): 2 pounds

Frequency: every other week

Non-chemical control

Cultural practice: Crop rotation with nonsusceptible crop (tomato, beans, corn) for a minimum of two years. The number of producers practicing crop rotation is 98%. However, some growers rotate from cantaloupe to watermelon, which isn't a real rotation.

Cultural practice: Tillage after harvest is important to bury crop residue which eliminate 50 to 80% of the inoculum that could infect the following year's crop. Approximately 98% of the growers use this practice.

Genetic alternative: Dan Egel

IPM practices: MELCAST system

Powdery Mildew

Damaging stage: Spores are agents of dispersal. They are produced within lesions, are wind disseminated through the field, and create numerous new infections.



Occurrence: June 15 to end of season.

Target: Foliage

Threshold: Two weeks before anticipated harvest application of systemic fungicide made.

Yield loss: 20 to 40% loss.

Quality loss: Sugar content reduced; size and color variances.

photo by Richard Latin

A powdery mildew outbreak is easy to identify. Clusters of infected plants appear throughout the field. The characteristic white mold occurs on both sides of the affected leaves. Severe outbreaks result in rapid defoliation, reduced production, and poor quality fruit.



Pesticide control

Acres treated: 95%

Pesticide: Benomyl
Common name: Benlate
Acres treated: 40%
Rate (acre): 8 ounces
Frequency: every 14 days

Pesticide: Thiophanate methyl
Common name: Topsin
Acres treated: 10%
Rate (acre): 5 ounces
Frequency: every 14 days

Pesticide: Triadimefon
Common name: Bayleton
Acres treated: 50%
Rate (acres): 4 ounces
Frequency: 14 to 21 days

Nonchemical control

Cultural practice: Crop rotation to nonsusceptible crop (tomato, corn, beans) for minimum of two years. Approximately 98% of the growers rotate crops.

Cultural practice: Post-harvest tillage to bury crop residue eliminates 50 to 80% of the pathogens. 98% fall till.

Genetic alternative: Several resistant varieties; 5 to 15% of the growers plant resistant varieties. Market prefers the non-resistant varieties, but preference changing toward resistant varieties.

Weeds

Grasses—Barnyard, Foxtail, and Crabgrass

photo by Dan Childs

Grasses are most often a problem in early spring. Rotating crops to avoid fields with high grass populations helps to reduce the problem.



Occurrence: Early to mid-May (South) and late May (North)

Target: Competition for nutrients, light, and water

Thresholds: None

Yield and quality loss: Reduction of total number melons and individual sizes.

Preplant pesticide control

Acres treated: 95%

Pesticide: Tank mix of Bensulid and Naptalam

Common name: Prefar and Alanap

Percentage of acres treated: 60%

Rates (acre): Prefar at 4-6 quarts; Alanap at 6-8 quarts under plastic

Frequency: Single application

Pesticide: Ethalfluralin

Common name: Curbit

Percent of acres treated: 40%

Rate (acre): 3 to 4 pints under plastic
Frequency: Single application

Postplant pesticide control

Acres treated: 50 to 60%

Pesticide: Sethoxydim
Common name: Poast
Percent of acres treated: 50 to 60%
Rate (acre): 1 pint
Frequency: Single application 4 to 6 weeks after planting

Pesticide: Ethalfluralin
Common name: Curbit
Percent of acres treated: 40%
Rate (acre): 3 to 4 pints under plastic
Frequency: Single application

Broadleaf—Pigweed, Lambsquarter, Morning glory, Velvetleaf, Ragweed

photo by Bob Nielson

Late season broadleaf weeds are difficult to control because most herbicides don't provide residual control.



Target: Competition for nutrients, light, and water

Threshold: None

Yield and quality loss: Reduction of total number of melons and individual sizes

Preplant Pesticide Control

Acres Treated: 95%
Pesticide: Tank mix of Bensulid and Naptalam
Common name: Prefar and Alanap
Rate (acre): 3 to 4 pints under plastic
Frequency: Single application

Early, shallow cultivation, when weeds are less than 6" minimizes weed competition.



Postplant Pesticide Control

Acres Treated: 0

Pesticide: No labeled product

Nonchemical control of grasses and broadleaves

Cultural practice: 50% of the growers use black plastic in rows to efficiently controls weeds.

Cultural practice: All growers use early cultivation between rows.

Cultural practice: Cover crops are planted between rows for early season weed control. Less than 5% of the growers grow cover crops.

Genetic alternative: None

IPM practice: No threshold. Recommend good rotation practices in low weed infested fields. Grower education on reducing the spread of weeds from heavily infested fields to other fields.

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Posted October 1998

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