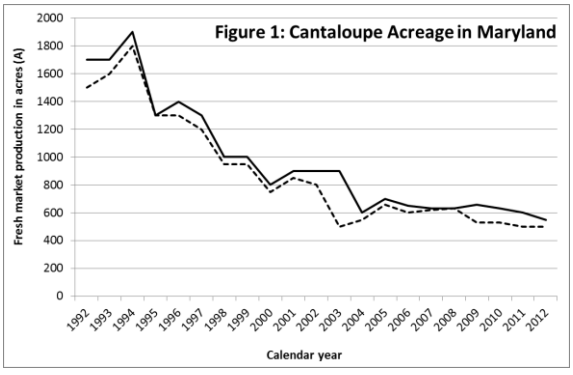
Fact Sheet

Cantaloupe (Muskmelon) in Maryland

Cantaloupe (*Cucumis melo*) is a warm-season crop that generated $319 million in sales in the U.S. in 2013 (1). Most commercial production occurs in California and Arizona, but historically production has centered in Maryland, Delaware and New Jersey (14). Cantaloupe grows best in well-drained silty or sandy loam soils with a pH of 6.0-6.5. This vegetable is well-suited to growers with small-scale cultivation of 5 acres or less (14), as production doesn't require a lot of specialized equipment, and fruit are highly marketable.

Decline in Production

Cantaloupe production in the mid-Atlantic has significantly decreased over the last twenty years. According to the Maryland Department of Agriculture, current fresh market cantaloupe acreage is 550 acres planted (solid line) and 500 acres harvested (dashed line). This is quite a drop from 1994's high of 1,900 acres planted and 1,800 acres harvested (Figure 1).



The decline in production is likely the result of several factors including: disease and insect pest pressure, labor demands and expense at harvest, and increased interstate and international market competition. Public concern about foodborne pathogens and disease outbreaks may also be contributing, as a widely publicized 2011 cantaloupe Listeria outbreak sickened 147 people and caused 33 deaths in multiple states (6).

Challenges in Organic Production

Cantaloupe production under organic practices has proven difficult because the majority of available cultivars are not well adapted to organic management. High quality, organically-produced or non-pesticide treated seed for a preferred cultivar may be more expensive, in short supply or not available. Restrictions on the use of pesticides for organic production further limit the crop's profitability. As a result, higher rates of external inputs (such as nutrient inputs) may be necessary to achieve stable yields (4,7). Fortunately, cultural practices like the use of cover crops and conservation tillage offer multiple benefits with minimal labor, time and machinery wear.

Cover Crops

Cover crops are typically grown in the off-season of an annual cash crop, and are planted to prevent soil erosion, minimize nutrient leaching, and improve soil health. A

wide range of plant species can be used as cover crops including: legumes (such as hairy vetch and clover), brassica (such as radish and mustard) and cereal grains (such as rye and buckwheat). Cover crops that are tilled into the soil are referred to as "green manures". No-till cover crops that are chemically or mechanically killed, with the residue left on the soil surface, are referred to as "cover crop mulches". Depending on the agronomic and environmental goals, a grower may plant a monoculture or multi-species cover crop mixture.

Benefits of Cover Crops

Cantaloupe grown with legume green manures and cover crop mulches had yields similar to plots that received synthetic N fertilizer (3,15). In other vegetable crops, green manures and cover crops mulches have been shown to: increase yield (2,9,11), suppress plant diseases (10-12,16), and reduce weeds (5,8,13).

In Our Study

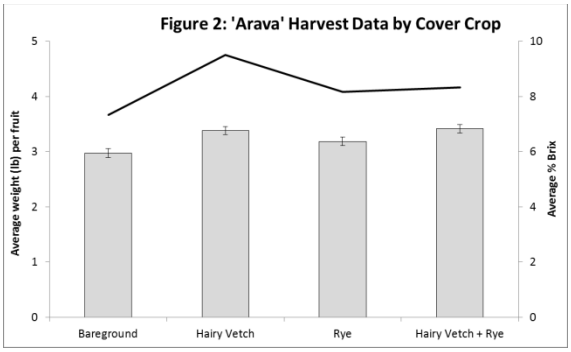
Experiments were conducted at the University of Maryland Lower Eastern Shore Research and Education Center in Salisbury, MD.

An experiment was conducted to evaluate the effect of cover crop green manure on certified organic land. Organic cover crops (hairy vetch at 40 lbs/A, rye at 70 lbs/A, and a 2:3 (w/w) hairy vetch + rye mixture) were seeded in plots on 22 October 2013. Bareground plots served as a control. Late the following spring, the cover crops were tilled into the soil. The field was leveled and raised beds were prepared; drip tape was laid and black plastic mulch was installed over the beds on 9-10 June 2014. Organic 'Arava' cantaloupe seedlings were transplanted on 11 June 2014 with plants spaced 2-ft apart on 7-ft centers in the row. Plants were irrigated and scouted weekly for the presence of disease or insect pests, and OMRI-approved pesticides were applied as necessary. Ripe cantaloupe fruit were harvested on 8, 15, 21 and 26 August and 2 September 2014, and the number and weight of marketable fruits were determined.

A second experiment was conducted to evaluate cultivar performance. Raised beds were prepared in two conventional fields, and drip tape was laid underneath black plastic mulch on 9-10 June 2014. Seedlings from six cantaloupe cultivars ('Arava', 'Athena', 'Delicious 51', 'Galia Regalia', 'Lambkin', and 'Sivan') and two honeydew cultivars ('Morning Dew' and 'Snow Mass') were transplanted on 11 June 2014 with plants spaced 2-ft apart on 7-ft centers. Plants were irrigated and scouted weekly, and pesticides were applied as necessary. Ripe fruit were harvested on 1, 5, 8, 11, 14, 18, 22 and 27 August and 2 September 2014, and the number and weight of marketable fruits were determined.

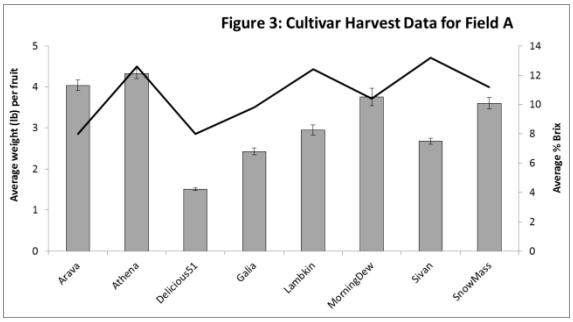
Results

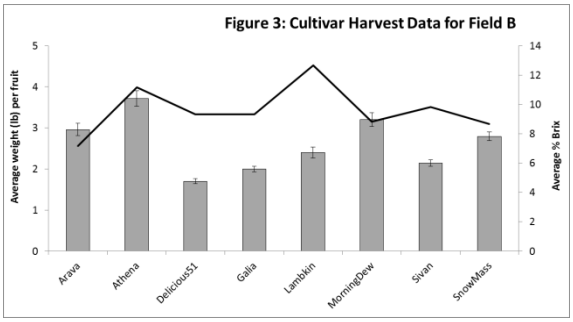
In the cover crop experiment, the average weight (bars) of 'Arava' fruit from bareground plots was significantly less than that of fruit from hairy vetch and hairy vetch + rye plots, but similar to that from rye plots (Figure 2). The average % Brix (soluble solids; solid line) and the total number of fruit harvested (data not shown) were similar between bareground plots and the three



green manure plots. However, fruit harvested from hairy vetch plots had the highest soluble solids at 9.50.

In the cultivar experiment, the average weight (bars) of fruit differed by cultivar (Figure 3). For both fields, ‘Athena’ fruit were the largest while ‘Delicious 51’ fruit were the smallest. The average % Brix (solid line) also differed by cultivar. ‘Sivan’ fruit had the highest soluble solids in field A, while ‘Lamkbin’ had the highest in field B. For both fields, ‘Arava’ fruit had the lowest soluble solids. The total number of fruit harvested in Field A was also greater than that harvested in Field B (data now shown). Foliar powdery mildew was observed on ‘Arava’, ‘Delicious 51’ and ‘Lambkin’.





Cultivar Characteristics

Arava: Galia type with a coarsely netted yellow to orange rind and green flesh

Athena: Eastern type with a coarsely netted straw rind and orange flesh

Delicious 51: Eastern type with a smooth orange rind, green sutures and orange flesh

Galia Regalia: Galia type with a moderately netted yellow rind and green fresh


Lambkin: Christmas type with a smooth striped, light green rind and light green to white flesh


Sivan: Gourmet type with a coarsely netted straw rind, green to pale yellow sutures and orange flesh


Morning Dew: Honeydew with a pale yellow to white rind and light green flesh


Snow Mass: Honeydew with a white rind and light green flesh

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