Spring Observations from WyeREC
By Michael Newell
Horticultural Crop Program Manager,
Maryland Agricultural Experiment Station
mnewell@umd.edu

Tree Fruit - Peach
Peach are nearly Full bloom at WyeREC. Some winter injury occurred on select varieties that resulted in low number on viable fruit buds. Crimson Lady had 99% bud loss. Fungicide applications for Blossom Blight management are critical at this time.

Tree Fruit - Asian pear
Yali and Atago are in full bloom. Monitoring for FireBlight using the Maryblyt model for disease outbreak predictions may help in determining when to spray for control of this bacterial disease.

Annual Plasticulture Strawberries
It continues to be a very trying year for this crop. Multiple sustained cold periods this winter caused crown damage to Chandler plants here at WyeREC. Of the 39 crowns that were examined 93% had damage to the cambium tissue (see photo 1). Although these plants did not die and there will be a crop from these plants, at this time we cannot determine how much of a reduced yield will be encountered.

As new leaves began to emerge recently, some leaves were malformed (see photo 2). The damage is somewhat similar to damage that can occur from Cyclamen mites, but after closer examination, no mites were found. I also saw similar damage at a growers field near Easton, MD. This field also had crown damage from the low winter temperatures.

Early flowering varieties (ie. Sweet Charlie, Strawberry Festival) may have many dead flowers present. These dead plant parts along with dead leaves can be a source of Botrytis inoculum that can infect both crown and flowers. Good sanitation (plot clean-up) and the application of crown-rot spray may be a good idea.

Dr. Schnabel’s lab at Clemson University continues to offer Botrytis resistance monitoring for strawberry. Please see the article in this newsletter edition for some of the results and recommendations. This is an important issue and we should take these recommendations very seriously.

With a later bloom period, I am always concerned with a warmer bloom period. Excess heat prior to and during bloom can cause heat damage to the flowers. Air temperatures in the upper 80’s under clear skies and light winds can push the flower temperatures into the mid 90’s. This is warm enough to cause damage. Using overhead sprinklers to evaporative cool the plants during the hottest part of the day can help mediate the effect of warm temperatures. If overhead irrigation is not possible, ensuring that the plants are well hydrated by running the drip prior to the warm spells can help.

The warmer temperatures can also increase the likely hood of strawberry bud weevil (clipper) causing damage. Scouting for this pest should begin when temperatures go above 65f when flower buds are emerging. Look for clipped buds. Sample from different parts of the field. Rows near woods or hedgerows are usually the most vulnerable. IPM threshold for this pest is 1 clipped bud per linear row foot. This pest does not clip open flowers!

Make plans to attend the 2014 Strawberry Twilight Meeting at the Wye Research and Education Center, Wednesday May 21st 6-8:00PM. Visit our website for directions. http://agresearch.umd.edu/wye

Photo #1 Cambium tissue damage
Photo taken 1/21/14
I have seen several strawberry fields in the past week that have some plants with distorted wrinkled appearing foliage (fig. 1). These leaves almost look like they have a virus, but the new foliar growth looks normal. This damage is most likely due to cold injury we had sometime this frigid spring and does not pose much of a problem as far as yield or fruit quality. However, another cold injury to the strawberry plants was seen in these same strawberry fields. This damage can be best seen in small plants that do not seem to be growing as well as many of their neighbors. When these plants are dug out of the bed the roots still look good (i.e., white and firm), but if the crown of the plant is cut length wise then the problem is apparent (fig. 2). The strawberry crown is actually a shortened plant stem. The central part of the crown, called the pith, is made up of large cells which are easily injured and turn brown because of the formation of ice crystals during winter or early spring. This central pith tissue is normally white and is sensitive to frost damage. Generally, minor freezing injury is characterized by a partial browning of the pith. However, with greater injury, the pith takes on a deeper shade of brown and the surrounding vascular layer turns brown or even black (fig. 2). Any injury to the vascular layer will represent loss of later plant growth, since the food and water conducting elements located in this layer have been damaged. After you make the longitudinal cut you should make your assessment of the tissue quickly because in about 30 seconds, the entire pith area will become darker in appearance because of exposure to air—not necessarily because of tissue damage.

Strawberry plants are quite resilient and even if there is internal cold injury to crown tissues plants can still recover, but the process could be slow and there will probably be some yield loss. This browning of the pith tissue also could be due to anthracnose, a plant disease. Anthracnose often causes a wilting of the plant and a reddish-brown area of the crown (fig. 3). All the strawberry plants I saw with a brown pith were checked for anthracnose, which was not found. Growers should be sure to determine whether the brown tissue is due to cold injury or a disease.
New Grape and Small Fruit Extension Pathologist at University of Maryland

Dr. Cassandra Swett has accepted the position of Grape/Small Fruit Extension Pathologist at the University of Maryland. Her primary responsibility is for Extension and research in grape and small fruit pathology and disease management in support of the Mid-Atlantic Fruit Consortium which supports the industries in Maryland, Pennsylvania, and West Virginia. She will be located in the Department of Plant Science and Landscape Architecture at the University of Maryland. Dr. Swett’s starting date is May 1, 2014.

Vegetable Crop Insects
Joanne Whalen, Extension IPM Specialist; jwhalen@udel.edu

Cabbage
Continue scouting fields for imported cabbage worm and diamondback larvae as soon as plants are placed in the field. With the recent warm temperatures, we are starting to see an increase in moth egg laying activity. As a general guideline, a treatment is recommended if you find 5% of the plants infested with larvae.

Peas
Be sure to sample peas for pea aphids as soon as small seedlings emerge. On small plants, you should sample for aphids by counting the number of aphids on 10 plants in 10 locations throughout a field. On larger plants, take 10 sweeps in 10 locations. As a general guideline, a treatment is recommended if you find 5-10 aphids per plant or 50 or more aphids per sweep.

Pesticide Updates
Joanne Whalen, Extension IPM Specialist; jwhalen@udel.edu

Metaldehyde Registration on Corn and Soybeans
Since EPA established the tolerances for metaldehyde use in corn and soybeans in December 2013, we have been in contact with both EPA and the registrants concerning the new labels. We have been told that EPA and the registrants are still working on details of the new labels. I have heard that EPA continues to have questions about broadcast and aerial applications on corn and soybeans so I will keep you posted as I hear more.

The good news is that manufacturers have indicated that there are still existing stocks of the old labeled product that will be available for use for slug management on corn and soybeans in 2014. I have a call into EPA and if I hear anything different I will let you know.

Calypso
Bayer CropScience has notified EPA of a voluntary cancellation of the Calypso insecticide registration, including the technical registration of thiacloprid. Bayer Crop Science will notify state departments of agriculture and request that Calypso be allowed for use through the existing stocks provision. They plan to maintain state registrations through 2016.

Larvin (Bayer Crop Science) – The insecticide Larvin is under an EPA Cancellation order, effective Jan 15, 2014. The existing stocks provision notes continued sale and distribution of the product after that date is prohibited. Please refer to the following link for more information on this cancellation notice:
http://www.regulations.gov/#!documentDetail;D=EPA_FRD_OC_0001-15304

2014 Fungicide Registration Updates
Kate Everts, Vegetable Pathologist
University of Delaware and University of Maryland; keverts@umd.edu

Proline
Proline has received a supplemental label for cucurbit vegetables. Target diseases include Fusarium wilt (Fusarium oxysporum); gummy stem blight (Didymella spp.), southern blight (Sclerotium rofisii), and powdery mildew (Sphaerotheca fuliginea Podosphaera xanthii) (Erysiphechichoracearum). Proline may be applied by either ground or chemigation application (including drip irrigation). Do not use in the transplant water or in the greenhouse.

We studied management of Fusarium wilt on watermelon with Proline at the UM LESREC Farm a few
years ago. In our trials three applications through the drip were necessary for season long management. Unfortunately only one soil (drip) application is allowed on the label. Up to two additional foliar applications may also be applied.

**Priaxor**
Brassica leafy vegetables group, which includes broccoli, Chinese cabbage, collards, kale and mustard greens, received a label for Priaxor. Target diseases include Alternaria leaf spot, anthracnose, Cercospora leaf spot, Rhizoctonia blight and white rust.

**Merivon**
Bulb vegetables, which include garlic, leek, onion and shallot, received a supplemental label for Merivon. Target disease include powdery mildew, purple blotch, Stemphylium leaf blight, and Botrytis.

Cucurbits (pumpkin, gourds, cantaloupe, watermelon, squash, etc.) also received a supplemental label for Merivon. Target diseases include Alternaria leaf blight, powdery mildew, anthracnose, Cercospora leaf spot, gummy stem blight, and Microdochium blight.

Leafy vegetables, including lettuce, spinach and Swiss chard, also received a supplemental label for Merivon. Target diseases include Alternaria leaf spot, anthracnose, powdery mildew, Septoria leaf spot, white rust, lettuce drop, and downy mildew.

Selected root vegetables including, beet, carrot, parsley, radish, and turnip, received a supplemental label for Merivon. Target diseases include Alternaria leaf spot and Cercospora leaf spot.

Read the labels carefully before use. These products should be used in ways that minimize resistance development.

The 2014 version of the **Commercial Vegetable Production Recommendations** is available in print, for purchase, from your county extension educator. In addition, the “Recommendations” are available online.

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**Chemical Gray Mold Control in Strawberries and Blackberries; Lessons from Four Years of Resistance Monitoring**

By Guido Schnabel
Professor & Plant Pathologist
Clemson University
schnabe at clemson.edu

Gray mold is a disease that you can always count on year after year. It is caused by a fungus, Botrytis, which infects flowers in the spring and from there moves on to the fruit. Preharvest and postharvest losses of 5 to 20 percent (depending on the year) are common. Protecting the flowers is the key to managing this disease and that is accomplished primarily with fungicides. Besides captan and thiram, there are fungicides from seven different chemical classes available for gray mold control. They include FRAC (Fungicide Resistance Action Committee) groups 1, 2, 7, 9, 11, 12, and 17. They are typically more effective and the risk toward consumer, worker, and environment is much less. But these benefits come at a price; all seven chemical classes are prone to resistance development.

You might think that SEVEN kinds of fungicides would be enough to control gray mold for the next 50 years or so, but think again. We are dealing with a ‘high risk’ fungus that is a champion among pathogens in adapting to stressful environments. Combine that with the selective pressure we are subjecting this fungus to (up to 15 applications per season) and you will begin to understand the results of our region-wide resistance monitoring that includes farms from many eastern states stretching from Pennsylvania to Florida.

Some of the highlights include:

- There is resistance to all seven chemical classes out there. Luckily, we do not find resistance to all fungicides everywhere.
- The resistance profile, i.e. the resistance phenotypes present in a population, varies with the farm. Typically a farm that historically has not been sprayed very much will have the least amount of resistance. From year to year the resistance profile can change, influenced by fungicide choices in the previous year and new Botrytis strains either brought in with transplants or drifting in from nearby inoculum sources.
- Resistance to FRAC 1 compounds (e.g. Topsin M) is extremely widespread and is a component of virtually all resistance genotypes we are finding. For example, strains that are resistant to Elevate are always also resistant to Topsin M. That means when you spray Topsin M or any other FRAC 1 compound you are selecting not only for increased prevalence of Topsin
M resistance but also resistance to additional compounds (in this example to Elevate). Therefore, we do not recommend FRAC 1 compounds any longer for disease control in strawberry production.

- Our data also shows that FRAC 11 compounds (Cabrio, Quadris), which had suppressive activity, have become largely ineffective against gray mold control. That means when you spray a combination product such as Pristine or Merivon, only one active ingredient in these mixtures (FRAC 7) works against gray mold. The FRAC 11 component, which is active against anthracnose, does not have to be applied routinely every year. Instead we recommend reducing the risk of resistance development in the anthracnose fungus by only applying FRAC 11 products when needed. For routine gray mold control FRAC 7 products should be used as solo formulations (e.g. Fontelis).

Our current recommendation is to use captan or thiram prior to bloom if needed. During bloom use captan during low disease pressure (during dry weather or during short rain events when temperatures are less than 60°F). Use a mixture of captan plus either FRAC 7 (e.g. Fontelis), 12 (e.g. Switch), or 17 (e.g. Elevate) during bloom prior to major rain events (rain lasting more than 12 hours at temperatures between 60°F and 70°F). Make sure you are getting at least 6 hrs of drying time.

Our lab at Clemson offers a (still) free resistance monitoring service that lets you identify what FRAC group to use during bloom together with Captan for optimal control. For more information on sampling go to the NCSU Strawberry website and download the 2014 Collection Instructions: http://strawberries.ces.ncsu.edu/.

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**New Grape and Small Fruit Extension Pathologist at the University of Maryland**

Dr. Cassandra Swett has accepted the position of Grape/Small Fruit Extension Pathologist at the University of Maryland. Her primary responsibility is for Extension and research in grape and small fruit pathology and disease management in support of the Mid-Atlantic Fruit Consortium which supports the industries in Maryland, Pennsylvania, and West Virginia. She will be located in the Department of Plant Science and Landscape Architecture at the University of Maryland. Dr. Swett’s starting date is May 1, 2014.

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**Disease Update: Apple Scab Infection Warning**

By Dr. Kari Peter

Penn State Fruit Research and Extension Center

http://extension.psu.edu/plants/tree-fruit

Posted: April 15, 2014

Apple scab spores are rapidly maturing and beginning to discharge. Combined with the rain and temperatures in the 60s, these are great conditions for scab infection. Early season apple cultivars with green tissue need to be protected. Click here to read more details.

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**Special IPM Pest Alert**

**Surge of Ambrosia and Bark Beetles**

By Stanton Gill,

Extension Specialist IPM for Greenhouses and Nurseries

University of Maryland Extension

Temperature reached 79°F on Sunday and will reach 78°F today in central Maryland. Our ethanol baited Lindgren traps pulled in a surge of ambrosia and bark beetles on Sunday and early Monday. The two most important ambrosia beetles found in the traps were *Xylosandrus germanus* with 38 adults in the traps and 17 *Xylosandrus crassiusculus*. These are the two ambrosia beetles most nursery managers are concerned about since they damage a wide range of nursery plants including styrax, redbud, dogwood, yellowwood, crape myrtle, sugar maple and many other thin barked trees.

Check the bark of smooth barked trees in your nursery today and see if you are finding wet areas on the bark. The wet areas would indicate that females are cutting through the bark into the trees.

We may get lucky because the temperatures are supposed to plummet to just above freezing by Wednesday and this should slow up activity of the ambrosia beetles. In 2013 we had a big surge on April 8 and 9 and a rapid drop down in populations when cold rains blew in and the temperature dropped into the
upper 40 °F range in 2013. We will probably see a similar situation where we have a lot of females out and active for a couple of days and then the activity dropping with the temperatures.

**Control:** If you do not find wet areas on the trunk, then I would hold off on spraying the trunks until the cold front blows through and temperatures start to rise. I will let you know the trap counts from CMREC and the several other sites we have in the state by Friday. In the nursery the material that has a label for bark beetles is bifenthrin under the brand name Onyx. We also collected other ambrosia beetles in the trap including 59 *Xyleborinus saxesenii* and 68 *Xylobornius alni*. We also had a low count of 3 *Monarthrum mali*. This is usually one of the first ambrosia beetles we pick up in our traps early in the season. Their color ranges from yellowish brown to very dark brown with a bicolored pronotum and elytra. None of these last three ambrosia beetles are major problems in nurseries.

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**Aronia: Matters of Labeling**  
By Andrew Ristvey  
Extension Alternative Crop Specialist  
University of Maryland

Many of us, when we first planted Aronia, thought that it was going to practically be a bullet-proof plant, few diseases and insect pests. However at the Wye Research and Education Center Aronia Orchard, plants put in the ground in May of 2006 started showing pest problems within the first two years. At that time, the Japanese Beetle proved to be the most problematic, but manageable so long as the populations were low. But in the past few years, especially after last summer's early rains, beetle populations have been on the rise and some entomologists are predicting a problematic season for 2014. Other problematic insects include Cherry Fruit Worm and the Brown Marmorated Stink Bug, both found in and on Aronia fruit at the orchard. Luckily, with very little control, the latter two have not been a big problem so far, with less than 5% of the fruit being affected. However, monitoring is necessary throughout the spring and summer for these insects. Also, recent accounts of the Spotted Wing Drosophila in Wisconsin have suggested that, while not a primary host, Aronia can attract this fruit fly. Two different fungal pathogens are known to infect Aronia including the rusts (identified as Quince-Apple Rust) and powdery mildew, the latter I have not seen in Maryland.

When it comes to managing these problems in Aronia, there are some options. However, pesticides are labeled for both the crop to which it's being applied, and the pest for which it is being applied. The question that should be asked is – “What’s labeled for Aronia?” While very few pesticides, both organic and conventional, have Aronia specifically labeled (since it is a relatively new crop), Rutgers University IR4 program has Aronia contained within the Index of Crops/Crop Groups/Crop Subgroups, and Crop Definitions, Section 13-07, Berry and Small Fruit category and specifically, Section 13-07B Bushberry and Small Fruits. If the pesticide label states either of these without stating Aronia specifically, it is OK to use on any pest also labeled. Sometimes the pesticide labels are a little less direct, stating berries or small fruits and then giving a specific list of fruit. In this case, since interpretation of labels is left in the hands of the States, it is advisable to contact the State Department of Agriculture and discuss the label with the appropriate staff so that they may give their interpretation. For more information on what to use on Aronia, contact Andrew Ristvey at: aristvey@umd.edu

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**Missed the Bay Area Fruit School?**  
February 26, 2014

**Videos are on the web at QACTV:**

- **David Myers** - UME, Anne Arundel Co.  
  *Establishing a Hop Yard and Meadow Style Fruit Planting Update*  
  Video-coverage

- **Bryan Butler** - UME, Carroll Co.  
  *Spotted Wing Drosophila and Brown Marmorated Stink Bug Updates*  
  Video-coverage

- **Jerry Frecon** - Adams Co. Nursery, Aspers, PA  
  *Stone Fruit Varieties for the Mid-Atlantic*  
  Video-coverage

- **Anna Wallis** - UME, Carroll Co.  
  *Apple Rootstock Trials*  
  Video-coverage

- **Richard Uva** - Seaberry Farm, Federalsburg MD  
  *Beach Plum-New Crop Development and Beach Plum Harvester Demonstration*  
  Video-Coverage

- **Kari Peter** - Penn State Fruit Research and Extension Center  
  *Managing Bacterial Diseases on Tree Fruit*  
  Video-coverage

- **Mike Newell** - Wye REC  
  *Cold Winter Temperatures and Frost Protection Strategies*  
  Video-coverage

- **MDA Representative**  
  *MDA Pesticide Hot Topics*  
  Video-coverage
The 2014 Annual Strawberry Twilight Meeting at the WREC in Queenstown, MD, will be held Wednesday, May 21 from 6-8 PM, rain or shine.

University of Maryland and USDA specialists will discuss current research, other small fruit growing topics, and “program production” of small fruit.

We'll have refreshments and pre-registration is not necessary. If you need special assistance to attend this program, please call Debbi Dant at 410-827-8056 x 115.

For additional program information, contact Michael Newell, Horticulture Crops Program Manager, 410-827-7388 or

Vegetable & Fruit Headline News

A timely publication for the commercial vegetable and fruit industry available electronically in 2014 from April through October on the following dates: April 17; May 15; June 19; July 17; August 14; September 18; and October 23.

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myersrd@umd.edu

Article submission deadlines for 2014: April 16; May 14; June 18; July 16; August 13; September 17; and October 20.

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Note: Registered Trade Mark® Products, Manufacturers, or Companies mentioned within this newsletter are not to be considered as sole endorsements. The information has been provided for educational purposes only.

See the Attachments!

1) Multi-Fruit Spray Guide.
2) The Customer is Still King
3) Sandea MD 24c on Cucumbers allows new 21 day PHI
Spray Program for Multi-Tree Fruit Orchards

Many local orchards are composed of multi-tree fruit combinations producing fresh market apples, peaches, pears, plums, nectarines, and cherries. Aggressive fruit tree spray programs are required to achieve high quality fruit. These multi-tree orchards create many spray management challenges for the achievement of good pest control in accordance to label guidelines. Therefore, the following multi-tree orchard spray program for the control of major tree fruit pests and diseases may offer some assistance:

Labeled as noted in 2014 for All Tree Fruit – Pomes: Apples & Pears; Stones: Peaches, Plums, Nectarines, and Cherries.

**FUNGICIDES: [FRAC] **RATE **NOTES

<table>
<thead>
<tr>
<th>Product</th>
<th>Rate</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Captain® 80WDG [M4]</td>
<td>3.5-5.0 lbs</td>
<td>General Protectant (Not Labeled for Pears; Reduce Rates for Cherries)</td>
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<tr>
<td>Dormant Oil [NC]</td>
<td>4.0 gal</td>
<td>Apply Temp 35-85°C F</td>
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<tr>
<td>Kocide® DF [M1]</td>
<td>6.0 lbs</td>
<td>Other Fixed Coppers</td>
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<tr>
<td>Adamant® 50WG [3/11]</td>
<td>6.0 ozs</td>
<td>Brown Rot, Peach Scab (Stones Except Plums)</td>
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<tr>
<td>Pristine® [7/11]</td>
<td>14.5 ozs</td>
<td>Brown Rot, Powdered Mildew (Limited to 4 Sprays/Season Mildew, Scab, Ruts &amp; With Only 2 Consecutively)</td>
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<td>Indar® 2F [3]</td>
<td>6.0 ozs</td>
<td>Powdery Mildew &amp; Rusts</td>
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<td>Toppin-M® 70W [1]</td>
<td>8.0 ozs</td>
<td>General Protectant</td>
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<td>Ziram 68DF [M3]</td>
<td>5.0 lbs</td>
<td>Dormant Peach Leaf Curl</td>
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<tr>
<td>Agrimycin® 17 W</td>
<td>24.0 ozs</td>
<td>Fireblight Control</td>
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**INSECTICIDES: [IRAC] **RATE **NOTES

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<td>Imidacloprid® 70W [1A]</td>
<td>2.0 lbs</td>
<td>Curriculo, Scale &amp; Fruit Moths</td>
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<tr>
<td>Warrior® [3]</td>
<td>4.0 ozs</td>
<td>Borers, Curriculo &amp; Fruit Moths</td>
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<tr>
<td>Tombstone® [3]</td>
<td>2.0 ozs</td>
<td>Aphids &amp; Curriculo</td>
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<tr>
<td>Actara® [4A]</td>
<td>4.5 ozs</td>
<td>Aphids &amp; Curriculo</td>
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<td>Lorsban® 4E [1B]</td>
<td>1.5 qts</td>
<td>Dormant &amp; Trunk Borer</td>
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<tr>
<td>Acramite® 50WS [25]</td>
<td>1.0 lbs</td>
<td>Mites Only</td>
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<tr>
<td>Sevin® 50W [1A]</td>
<td>4.0 lbs</td>
<td>Japanese Beetles, (Apple Thinning Agent) Hornets &amp; Sap Beetles</td>
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**Herbicides: [HRAC] **RATE **NOTES

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<tr>
<td>Gramoxone® [22]</td>
<td>1.0 qts</td>
<td>Burndown, Directed Spray</td>
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<td>Roundup® [9]</td>
<td>1.0 qts</td>
<td>Burndown, Shielded &amp; Directed Spray</td>
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<td>Devrinol® 50 DF [15]</td>
<td>4.0 lbs</td>
<td>Spring/Summer 35-day PHI</td>
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<td>Princep® 4L [5]</td>
<td>1.0 qts</td>
<td>Spring Dormant, Avoid High pH Soils</td>
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<td>Sooligan® [12]</td>
<td>2.5 lbs</td>
<td>Spring/Fall Dormant, 1-yr Established</td>
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<td>Goal® [14] or Galigan® [14]</td>
<td>2.0 pts</td>
<td>After Harvest to Spring Bud Swell</td>
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<td>Aim® [14] or Shark® [14]</td>
<td>2.0 ozs</td>
<td>Directed Spray to Weeds, 3-day PHI</td>
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<td>Matrix® [2]</td>
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<td>Late Spring, 1-yr Established</td>
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<td>Pyran® [1]</td>
<td>1.5 pts</td>
<td>Summer Grasses, Variable PHI</td>
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<tr>
<td>Karmex® [7] or Diuron® [7]</td>
<td>1.6 qts</td>
<td>Spring/Fall Dormant, 3-yr Established</td>
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**Lowest Use Rate Recommended Initially**

**Multi-Fruit Spray Calendar**

**March 15 - Dormant Spray**
- Dormant Oil 4.0 gal (Scales & Mites)
- Kocide® DF 6.0 lbs
- Lorsban® 4E 1.5 qts (Mites)

**April 5 - Peach Bloom**
- Captain® 80WDG 3.0 lbs
- Captain® 50W 3.0 lbs
- Acramite® 17 W 24.0 ozs (Fireblight Control Add for Apples & Pears Only)

**April 15 - Peach Petal Fall**
- Captain® 50W 3.0 lbs
- Acramite® 17 W 24.0 ozs (Fireblight Control Add for Apples & Pears Only)

**May 1 - 1st Cover Spray**
- Captain® 80WDG 4.0 lbs (Cedar Apple Rust - Higher Rates for Wetter Conditions)
- Instar® 2F 6.0 ozs (Powdery Mildew & Rusts)
- Actara® 4.5 ozs (Curriculo & Aphids; PHI: 22-25 Days Pomes, 14-21 Days Stones)

**May 15 - 2nd Cover Spray**
- Captain® 80WDG 3-4.0 lbs
- Rally® 40W 4.0 ozs (Peach Rusty Spot Only)
- Warrior® 4.0 ozs (Curriculo; PHI 21-25 Days Pomes, 14-21 Days Stones)

**June 1 - 3rd Cover Spray**
- Captain® 80WDG 3-4.0 lbs
- Toppin-M® 70W 8.0 ozs (Apple Scab Resistance Likely)
- Imidan® 70W 2.0 lbs (Curriculo, Scale & Fruit Moths; PHI: 7-10 Days Pomes, 14-17 Days Stones)
- Acramite® 55WS 1.0 lbs (For Mites if Required; PHI: 7-10 Days Pomes, 14-17 Days Stones)

**June 15 - 4th Cover Spray**
- Captain® 80WDG 3-4.0 lbs
- Sulfur 95W 3.0 lbs (0-Day PHI; Stones Only)
- Tombstone® 2.0 ozs (Borers, Curriculo & Fruit Moths - 7-day PHI)

**July 1 - 5th Cover Spray**
- Captain® 80WDG 3-4.0 lbs
- Sulfur 95W 3.0 lbs (0-Day PHI; Stones Only)
- Sevin® 50W 4.0 lbs (Japanese Beetle & Mites – 3-Day PHI for All Fruit)

**August 1 - 7th Cover Spray**
- Captain® 80WDG 9.0 lbs (0-Day PHI; 21-day PHI)
- Sevin® 15.0 ozs (Pomegranate & Pears Only)

**September 1 - 9th Cover Spray**
- Captain® 80WDG 9.0 lbs (0-Day PHI; 21-day PHI)
- Sevin® 15.0 ozs (Pomegranate & Pears Only)

**September 15 - Trunk Bore Spray**
- Lorsban® 4E 1.5 qts (Post Harvest for Borers)

**Herbicides: [HRAC] **RATE **NOTES

<table>
<thead>
<tr>
<th>Product</th>
<th>Rate</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gramoxone® [22]</td>
<td>1.0 qts</td>
<td>Burndown, Directed Spray</td>
</tr>
<tr>
<td>Roundup® [9]</td>
<td>1.0 qts</td>
<td>Burndown, Shielded &amp; Directed Spray</td>
</tr>
<tr>
<td>Devrinol® 50 DF [15]</td>
<td>4.0 lbs</td>
<td>Spring/Summer 35-day PHI</td>
</tr>
<tr>
<td>Princep® 4L [5]</td>
<td>1.0 qts</td>
<td>Spring Dormant, Avoid High pH Soils</td>
</tr>
<tr>
<td>Sooligan® [12]</td>
<td>2.5 lbs</td>
<td>Spring/Fall Dormant, 1-yr Established</td>
</tr>
<tr>
<td>Goal® [14] or Galigan® [14]</td>
<td>2.0 pts</td>
<td>After Harvest to Spring Bud Swell</td>
</tr>
<tr>
<td>Aim® [14] or Shark® [14]</td>
<td>2.0 ozs</td>
<td>Directed Spray to Weeds, 3-day PHI</td>
</tr>
<tr>
<td>Matrix® [2]</td>
<td>4.0 ozs</td>
<td>Late Spring, 1-yr Established</td>
</tr>
<tr>
<td>Pyran® [1]</td>
<td>1.5 pts</td>
<td>Summer Grasses, Variable PHI</td>
</tr>
<tr>
<td>Karmex® [7] or Diuron® [7]</td>
<td>1.6 qts</td>
<td>Spring/Fall Dormant, 3-yr Established</td>
</tr>
</tbody>
</table>

**Organic Approach Substitutions:**

<table>
<thead>
<tr>
<th>Conventional Product</th>
<th>Organic Certified Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Captain® &amp; Toppin-M®</td>
<td>Surround® (2) or Sulfur or Lime Sulfur</td>
</tr>
<tr>
<td>Rally®</td>
<td>Kalligreen (Powdery Mildew Eradicant)</td>
</tr>
<tr>
<td>Listed Insecticides</td>
<td>Neem® or Pyganic® or Entrust® (Stone Fruits Only)</td>
</tr>
<tr>
<td>Agrimycin®</td>
<td>Agrimycin® or Fixed Copper (Apples &amp; Pears Except During Bloom)</td>
</tr>
</tbody>
</table>

* Important Note: The calendar spray dates given are an average estimate for Anne Arundel and Prince George’s County Orchards, and may vary by location in Southern Maryland. Be sure to adjust your spray schedule application dates accordingly. The above recommendations very closely reflect the current spray program utilized at the University of Maryland Research and Education Center, Upper Marlboro Facility for its research orchards. Remember to always “Read the Label.”

R. David Myers
Extension Agent, Agriculture
Spray Program for Multi-Small Fruit Plantings

Many local farms are composed of multi-small fruit combinations producing fresh market blackberries, raspberries, blueberries, strawberries and grapes. Aggressive fruit spray programs are required to achieve high quality fruit. These multi-small fruit plantings create many spray management challenges for the achievement of good pest control in accordance to label guidelines.

Therefore, the following multi-small fruit spray program for the control of major small fruit pests and diseases may offer some assistance:

**Labeled as noted in 2014 for All Small Fruit – Strawberries, Blackberries, Blueberries, and Grapes.**

**FUNGICIDES: [FRAC]**

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>RATE</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lime Sulfur [M2]</td>
<td>10.0 gals</td>
<td>Dormant Fall Sanitizer</td>
</tr>
<tr>
<td>JMS’ Stylet Oil [NC]</td>
<td>1.0 gal</td>
<td>Apply Temp 35-85°F</td>
</tr>
<tr>
<td>Kocide® DF [M1]</td>
<td>2.0 lbs</td>
<td>Other Fixed Coppers</td>
</tr>
<tr>
<td>Captan® 50W [M4]</td>
<td>2.0 lbs</td>
<td>General Protectant</td>
</tr>
<tr>
<td>Ziram® 76DF [M3]</td>
<td>5.0 lbs</td>
<td>General Protectant</td>
</tr>
</tbody>
</table>

(Except for Strawberry use Thiram®)

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>RATE</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur 95W [M2]</td>
<td>3.0 lbs</td>
<td>General Protectant</td>
</tr>
</tbody>
</table>

(Grape variety sensitivity)

**INSECTICIDES: [IRAC]**

<table>
<thead>
<tr>
<th>INGREDIENT</th>
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<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rally® 40W [3]</td>
<td>4.0 ozs</td>
<td>Powdery Mildew &amp; Black Rot</td>
</tr>
<tr>
<td>Pristine® [7/11]</td>
<td>14.5 ozs</td>
<td>Fruit Rots, Fruits Spots, Powdery &amp; Downy Mildew &amp; Cane Blight</td>
</tr>
<tr>
<td>Elevate® 50 WG [17]</td>
<td>1.5 lbs</td>
<td>Botrytis &amp; Powdery Mildew</td>
</tr>
<tr>
<td>Switch® 62.5 WG [9/12]</td>
<td>11.0 ozs</td>
<td>Anthracnose, Mummy Berry, Phomopsis, Sour Rot &amp; Botrytis</td>
</tr>
<tr>
<td>Phostro® [33]</td>
<td>4.0 pts</td>
<td>Downy Mildew &amp; Red Stele</td>
</tr>
</tbody>
</table>

**HERBICIDES: [HRAC]**

**Multi-Small Fruit Spray Calendar**

**March 5** - Spring Dormant Spray
JMS’ Stylet Oil 1.0 gal (Scales & Mites)

**April 10** - Early Strawberry Bloom
Captain® 50W 2.0 lbs
Thiram® 75WDG 5.0 lbs (Strawberry Only)

**April 15** - Strawberry Bloom/ Blueberry Early Bloom
Captain® 50W 2.0 lbs
Ziram 76DF 5.0 lbs (Except Strawberry)
Brigade® WS 12.0 ozs (Clipper Beetle, 0-3 day PHI)

**April 25** - Strawberry Full Bloom/ Blueberry Mid-Bloom/ Grape Bud Break
Captain® 50W 2.0 lbs
Pristine® 14.5 ozs
Brigade® WS 12.0 ozs (Clipper Beetle, 0-3 day PHI)

**May 5** - Strawberry 1st Cover & Early Harvest Spray/ Blueberry Full Bloom/ Grape & Bramble Shoot Growth
Captain® 50W 2.0 lbs (0-3 Day PHI & 4-Day REI)
Elevate® 1.5 lbs (0-day PHI)
Provo® 4.5 ozs (Curcullus & Aphids; 7-Day PHI)

**May 15** - Strawberry 2nd Cover & Harvest Spray/ Blueberry 1st Cover/ Grape Bloom Spray/ Bramble Can Development
Captain® 50W 2.0 lbs (0-3 Day PHI & 4-Day REI)
Switch® 11.0 ozs (0-day PHI)
Malathion® 2.0 pts (Curcullus, Scale & Fruit Moths; 0-3 day PHI)

**June 1** - Strawberry 3rd Cover & Harvest Spray/ Blueberry 2nd cover/ Grape 1st Cover/ Bramble Bloom
Captain® 50W 2.0 lbs (0-3 Day PHI & 4-Day REI)
Pristine® 14.5 ozs (0-day PHI)
Malathion® 2.0 pts (Curcullus, Scale & Fruit Moths; 0-3 day PHI)

**June 15** - Strawberry 4th Cover & Harvest Spray/ Blueberry 3rd Cover & Early Harvest/ Bramble 1st Cover/ Grape 2nd Cover
Captain® 50W 2.0 lbs (0-3 Day PHI & 4-Day REI)
Elevate® 1.5 lbs (0-day PHI)
Sevin® 50W 4.0 lbs (sap beetle, 3-Day PHI)

**July 1** - Strawberry Renovation/ Blueberry 4th Cover & Harvest/ Bramble 2nd Cover & Early Harvest/ Grape 3rd Cover
Captain® 50W 2.0 lbs (0-3 Day PHI & 4-Day REI)
Pristine® 14.5 ozs (0-day PHI)
Rally® 40 W 4.0 ozs (Except Blueberry, 0-day PHI))
Brigade® WS 12.0 ozs (0-3 day PHI)

**July 15** - Strawberry Post Harvest/ Blueberry 5th Cover & Harvest/ Bramble 3rd Cover & Harvest/ Grape 4th Cover & Verasion
Captain® 50W 2.0 lbs (0-3 Day PHI & 4-Day REI)
Switch® 11.0 ozs (0-day PHI)
Sulfur 95W 3.0 lbs (0-day PHI)
or Kocide® DF 2.0 lbs (0-day PHI)
Malathion 2.0 pts (0-3 day PHI)

**August 1** - Strawberry Post Harvest/ Blueberry 6th Cover & Harvest/ Bramble 4th Cover & Harvest/ Grape 5th Cover & Harvest/ Strawberry Post Harvest/ Grape 6th Cover & Harvest/ Blueberry Post Harvest/ Grape 5th Cover & Harvest
Captain® 50W 2.0 lbs (0-3 Day PHI & 4-Day REI)
Elevate® 1.5 lbs (0-day PHI)
Phostro® 4.0 pts (0-day PHI)
Sevin® 50W 4.0 lbs (Hornets – 3 Day PHI for All Fruit)

**November 25** Fall Dormant
Lime Sulfur 10.0 gals
Kocide® DF 2.0 lbs (0-day PHI)

**Organic Approach Substitutions:**

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<td>Listed Insecticides</td>
<td>Neem® or Pygacrid® or Entrust® or Dipel®</td>
</tr>
<tr>
<td>Gramoxone® or Roundup®</td>
<td>Scythe® or Avenger®</td>
</tr>
</tbody>
</table>

* Important Note: The calendar spray dates given are an average estimate for Anne Arundel and Prince George’s County small fruit production, and may vary by location in Southern Maryland. Be sure to adjust your spray schedule application dates accordingly. The above recommendations very closely reflect the current spray program utilized at the University of Maryland Research and Education Center, Upper Marlboro Facility for its research fruit plots. Remember to always “Read the Label”.

R. David Myers
Extension Agent, Agriculture
The Customer is Still King

Regardless of your direct marketing outlet (farmers’ market, on-farm stand, CSA, or Pick-Your-Own), great customer service is the undeniable business principle that cannot be neglected in order to have a sustainable and profitable business. Even though we’re increasingly connected by our electronic devices and messages, the human side of doing business still matters.

At the start of the market season, most producers are attentive to new and returning customers. But, too many producers think customer service is like going to the dentist—something you have to think about every six months or so or when there’s a problem and it’s really hurting their business. But if you think like a customer, then you will see the need to be continuous rather than the occasional or shotgun approaches to customer service. It’s defined by the way you systematically handle the problems that occur with your customers on a daily basis.

Things do go wrong, marketing surveys indicate that 25 percent of all consumer purchases result in some type of problem. It seems like a very high percentage until you factor in the additional data that reveals that 70 percent of people who experience a problem do not complain. The reason they don’t complain is:

1. They do not think complaining is worth their time or effort,
2. They don’t know how or where to complain or,
3. They want to avoid conflict.
One of the most cost-effective marketing strategies your business can pursue is to provide outstanding customer service. That means fixing things that have gone wrong, i.e., receiving the complaint; responding to it in a timely manner. If you fail to fix the problem you might experience the following:

- 64 to 91 percent of those who had a problem, but didn’t complain, will not return.
- 55 to 81 percent of those who complain and don’t get satisfaction will not return.
- At one time, the rule of thumb was the dissatisfied customers tell an average of 10 other people about their bad experiences. But, with the advent of social media such as Facebook and Twitter, an unhappy customer can tell hundreds of their friends and their friends “friends” about their unsatisfactory experience with your products or services.

Effective handling of customer complaints and attention to customer service details can turn those statistics in your favor. Allowing customers to vent, listening intently, and making sure the solution satisfies the customer can distinguish your business from your competitor’s in the customer’s mind.

**Good customer service means:**

1. Having knowledge about your products, your inventory, and your experiences with the product that will help your customer make the best choice for them. For example, it’s difficult to help a market customer decide purchasing bok choi or Russian kale if you’ve never eaten or cooked with them.

2. Treat customers with a friendly, helpful attitude. Don’t be patronizing but, do greet them with a smile and try to connect with them.

3. Thank them for making a purchase or for just stopping by.

Don’t neglect training your employees in good customer relations too. Help your employees develop their “people” skills as well as their knowledge about your operation. They are often the person unhappy customers will approach first.
This label expires and must not be distributed or used in accordance with this SLN registration after 12/31/2018

ACTIVE INGREDIENT: % BY WT.
Halosulfuron-methyl ...................................................................................................................... 75.0%
OTHER INGREDIENTS ...................................................................................................................... 25.0%
TOTAL 100.0%

KEEP OUT OF REACH OF CHILDREN CAUTION

- This labeling must be in the possession of the user at the time of pesticide application.
- It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.
- All applicable directions, restrictions and precautions on the EPA registered label are to be followed.

DIRECTIONS FOR USE

PREHARVEST INTERVAL

The required days between last application and harvest are given in ( ) after each crop name.

<table>
<thead>
<tr>
<th>CROP</th>
<th>OZ/ACRE</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>
| CUCUMBERS (including pickles) (21) | 1/2 – 1 | Apply uniformly with ground equipment in a minimum of 15 gallons of water per acre. Direct-seeded: Bare ground (no mulch)  
- Preemergence - Apply SANDEA after planting, but prior to soil cracking. Use the lower rate on lighter textured soils with low organic matter.  
- Postemergence - Apply SANDEA after the crop has reached at least 3 to 5 true leaves but before first female flowers appear. SANDEA can be applied as an over-the-top application, a directed spray application, or with crop shields to minimize contact of the herbicide with the crop.  
Direct-seeded: Plastic mulch  
- Pre-seeding - Apply SANDEA following final bed shaping and just prior to the installation of the plastic mulch. Crop may be seeded into this treated area no sooner than 7 days after application and the installation of the plastic mulch unless local conditions demonstrate safety at an earlier interval. Use the lower rate on lighter textured soils with low organic matter.  
- Postemergence - Apply SANDEA after the crop has at least 3 to 5 true leaves but before first female flowers appear. SANDEA can be applied as an over-the-top application, a directed spray application, or with crop shields to minimize contact of the herbicide with the crop. Additional phytotoxicity may occur when applications are made over plastic due to concentration of product in the planting hole. Note: Over-the-top applications on plastic are not allowed in Northeastern and Midwestern states.  
Transplanted: Bare ground (no mulch)  
- Pre-transplant - Apply SANDEA as a pre-transplant application. Crop may be transplanted into this treated area no sooner than 7 days after application unless local conditions demonstrate safety at an earlier interval. Use the lower rate on lighter textured soils with low organic matter. Care should be taken to limit movement of SANDEA-treated surface soil during the transplanting process since if treated soil is moved into the transplant hole injury can occur.  
- Post-transplant - Apply SANDEA to transplants that are established and actively growing. Applications should not be made until plants are actively growing and in the 3 to 5 true leaf stage or no sooner than 14 days after transplanting unless local conditions demonstrate safety at an earlier interval, but before first female flowers appear. SANDEA may be applied as an over-the-top application, a directed spray application, or with crop shields to minimize contact of the herbicide with the crop. |
<table>
<thead>
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</tr>
</thead>
</table>
| CUCUMBERS (including pickles) (21) | 1/2 – 1 | **Transplanted: Plastic mulch**  
- **Pre-transplant**: Apply SANDEA following final bed shaping and just prior to the installation of the plastic mulch. Crop may be transplanted into this treated area no sooner than 7 days after the application and the installation of the plastic mulch unless local conditions demonstrate safety at an earlier interval. Use the lower rate on lighter textured soils with low organic matter. Care should be taken to limit movement of SANDEA-treated surface soil during the transplanting process since if treated soil is moved into the transplant hole injury can occur.  
- **Post-transplant**: Apply SANDEA to transplants that are established, actively growing and in the 3 to 5 true leaf stage or no sooner than 14 days after transplanting unless local conditions demonstrate safety at an earlier interval, but before first female flowers appear. Apply SANDEA as an over-the-top application, a directed spray application, or with crop shields to minimize contact of the herbicide with the crop. Additional phytotoxicity can occur when applications are made over plastic due to concentration of product in the transplant hole. Note: Over-the-top applications on plastic are not allowed in Northeastern and Midwestern states. |

| CUCUMBERS (including pickles) (21) | 1/2 – 1 | **Split Applications for Nutsedge:**  
- **Preemergence followed by postemergence for nutsedge control**  
  To maximize control of nutsedge, it may be necessary to use a postemergence application to those areas where the nutsedge has emerged later following a preemergence application. For these situations, use a spot treatment method treating only those areas of emerged nutsedge. Application rate should not exceed 1.0 oz. product per treated acre in these areas. Use a water volume that will allow for good coverage of the plants. Avoid contact of the herbicide with the planted crop.  
- **Postemergence followed by postemergence for nutsedge control**  
  To maximize control of nutsedge, it may be necessary to use a second postemergence spot application to those areas where the nutsedge has emerged or re-grown. For these situations, use a spot treatment method treating only those areas of emerged nutsedge. Allow a minimum of 21 days between applications. Application rate should not exceed 1.0 oz. product per treated acre in these areas. Use a water volume that will allow for good coverage of the plants. Avoid contact of the herbicide with the planted crop.  

| 1/2 – 1 | **Direct-seeded and Transplant:**  
- **Row Middle/Furrow Applications** - Apply SANDEA between rows of direct-seeded or transplanted crop. Avoid contact of the herbicide with the planted crop. If plastic is used on the planted row, adjust equipment to keep the application off the plastic. Reduce rate and spray volume in proportion to area actually sprayed.  
- A maximum of 2 applications may be made per crop-cycle.  
- Do not apply more than 2 oz. SANDEA per acre per crop-cycle not to exceed 2 oz. per acre per 12 month period (includes applications to the crop and to row middle/furrows).  
- Runners that come in contact with the plastic can pick up residual SANDEA and may exhibit a visual crop response.  
- Consult “Use Precautions” and “For Optimum Results” for important usage information. |

**NOTE**: This product is sold subject to the CONDITIONS OF SALE set forth on the container label.

**24(c) Registrant**: Gowan Company, P.O. Box 5569, Yuma, AZ, 85366-5569