Dave’s Ramble

The last time I looked the sky was still there. Our heaven encircled earth a balm for the soul at every suns appearing. Once again the sun has decided to remain with us, not choosing to journey away - Our days will grow longer. Rejoice! We that are by the fire for only a short season, dream of the sowing and reaping. All things under the sun have a purpose; be sure to take time to convince yourself and others of this truth. Dormant blooms await our toil, farmers will always have work. A much clearer purpose I reflect: We grow crops to feed cows which produce milk for the building of stronger young men and women.

Opportunity has never been greater for agricultural science and farming careers. Educated and reasonable minds will set a much nobler course for agriculture. A generation of leading scientific discovery will be birthed in the biological life science laboratories of our Agricultural Colleges. I stand convinced that for agricultural advancement: Global warming will eventually be declared a good thing; We will embrace the concepts of organic production symbiotically melded with traditional pest management systems; Sustainable agricultural methods will continue to improve our soils, protect our watersheds and balance our ecosystems; Urban green systems in our cities will cool us, feed us and please our senses. As tax payers we should demand that agriculture be integrated at all tiers of our society for the benefit of every citizen. Every planned community should be blessed with orchards, vineyards, vegetables, grains, pastures, livestock, greenhouses and nurseries.

Farming, our forgotten right, should never become the hobby of the wealthy or orphaned by the wayside as a preservation district or green space. Wake up lovers of agriculture and behold; The sky is not falling!
Winter & Spring Meetings
Mark your calendars now and plan to be a part of the winter and spring Extension meetings.

Farm Estate Planning Workshop
January 18, 2007

Estate planning is often pushed aside until it’s too late. However, the process of creating a plan for transfer of property from one generation to another is a critical step to avoid hefty taxes, maintain family unity and ease anxiety after the death of a family member. Estate tax laws have been changing, land values have been escalating and family needs may have been altered so thinking through the best options for the next three years and beyond has become even more crucial for many farmers.

Maryland Cooperative Extension and the Northeast Center for Risk Management Education are co-sponsoring a Farm Estate Planning Workshop on January 18 at the Hughesville Realtors Building in Hughesville. The workshop will begin at 9:30 a.m. and will last until 3 p.m.

The workshop will focus on farm estate planning basics. Some of the topics to be discussed are: Estate Planning Objectives; Developing and Implementing a Plan; Federal and State Estate and Gift Taxes; Wills; Property Ownership; Use of Trusts; and Special Provisions for Farms and Small Businesses.

Because of USDA support, the workshops have no registration fee. Lunch is provided. Registration is necessary to plan food and handouts. Please telephone Ben Beale, St. Mary’s County at 301 475 4484 to register for the class. Seating is limited, so please call soon.

Become a Certified Private Applicator
If you have allowed your pesticide certification to expire or are a new applicant, then you must attend the Private Pesticide Applicator Certification Training and pass the exam. A Private Applicator Certification Training will be conducted at the Davidsonville Family Recreation Center (DFRC) from 7:00 to 9:00 p.m. on January 8, 2007. A Private Pesticide Applicator Exam will be given at the Davidsonville Family and Recreation Center (DFRC) from 7:00 to 9:00 p.m. on January 22, 2007.

Maryland/Delaware Forage Council Holds Pasture & Hay Conference
Southern Maryland Hay & Pasture Conference
Waldorf, Maryland, Isaac Walton League
January 24, 2007

Maryland Delaware Forage Council invites you to attend the Southern and Central Maryland Hay & Pasture Conference to be held at the Izaak Walton League in Waldorf, Maryland from 8:30 a.m. to 3:30 p.m. The presentations will address key issues and concerns facing hay and pasture producers. Topics will include: Improving hay and pasture production; Weed control options for hay and pasture; Insect problems of alfalfa and forage grasses; Low cost fertility for forage crops; Nitrogen value of legumes in pastures; Maintenance, adjustment and operation of mower-conditioners to minimize drying time and dry matter losses in hay production; Inexpensive techniques for adding legumes or some grasses to pasture and hayland; and New developments in Grasses and legumes for hay and pasture. The conference program is approved for the following continuation education credits: Certified Crop advisor; Certified Grassland Professional; Maryland Private Applicator Pesticide Recertification; and Nutrient Management Voucher.

The conferences also feature displays and exhibits by agribusinesses. Attendees will be able to obtain information on seed, fertilizer, equipment, fencing, etc. needed for hay and pasture production and management. For more information and registration contact Ben Beale at the St. Mary’s Extension Office at 301 475-4481.

Central Maryland Vegetable Growers Mtg.
January 26, 2007

This well sponsored, large grower meeting always offers a great deal of vegetable industry information. The Central Maryland Vegetable Growers Meeting will be held on January 26, 2007 from 8:00 a.m. to 3:30 p.m. at the Friendly Farm Inn, located on Foreston Rd. in Upperco, MD. Pesticide recertification credits are awarded for attending this meeting. For full meeting details, and to register call the Baltimore County Extension Office at 410 666-1024 today.

Produce Buyer/Grower Meeting
January 29, 2007

Spring is coming, as well as the 2007 produce growing season! In an effort to help you increase your profits, the Marketing staff at the Maryland Department of Agriculture is coordinating the fifth annual Produce Buyer/ Grower meeting to be held on Monday, January 29, 2007 at MDA headquarters in Annapolis in Room 110. Registration and coffee will begin at 9:30 am; the program will begin at 10:00 a.m. and conclude about 1:30 pm.

This program will enable you to meet the buyers from several grocery store chains and food service companies. Invitees include:
You will have the opportunity to speak to the buyers one-on-one and will receive information about the stores’ needs. We will also have a space for you to display photographs and other promotional materials about your operation. In addition, you will have the opportunity to learn more about the different services that the Maryland Department of Agriculture provides to growers (including GAP – Good Agricultural Practices – certification), new products developed by the USDA Agricultural Research Service in Beltsville, and more.

So mark your calendar and return the registration form today. Please take a moment to completely fill out the grower questionnaire so that potential buyers can locate you to meet their needs. I hope you have time to be a part of this important event and look forward to your participation.

For more information contact Jane M. Storrs, National Marketing Director, Maryland Department of Agriculture at 410 841-5710.

2007 Mid-Atlantic Fruit & Vegetable Convention in Hershey, PA
January 30 – February 1, 2007

Nearly 2,000 persons, mostly fruit and vegetable growers, from throughout Pennsylvania, Maryland, New Jersey and other states are expected to gather at the Hershey Lodge and Convention Center for the 2007 Mid-Atlantic Fruit and Convention. The event is jointly sponsored by the State Horticultural Association of Pennsylvania, the Pennsylvania Vegetable Growers Association, the Maryland State Horticultural Society and the New Jersey State Horticultural Society.

The Great American Hall at the Hershey Lodge and Convention Center will host the Trade Show with over 130 exhibitors. Specialized horticultural equipment, farm market merchandise, and packaging, will all be on display along with information on the latest seed varieties, fruit varieties, pesticides and other supplies and services for the commercial grower.

Registration either through the mail or at the door is required to attend both the trade show and educational sessions. For more information on registration, contact: William Troxell, Pennsylvania Vegetable Growers Association - 717-694-3596 or pvga@pvga.org

New Grape Growers Workshop
February 15, 2007

If you are considering planting a vineyard, or you have just recently done so, you will benefit from the information provided at the New Grape Growers Workshop. This educational one-day workshop will provide a good overview of what is involved with getting a commercial vineyard started in Maryland, and is part one of a two-part series. The second workshop, to be offered in the spring, will discuss the ins and outs of starting a winery.

There has been tremendous interest in the wine grape production throughout Maryland and there are many locations on the Eastern Shore where high quality grapes can be grown. However, successfully establishing a grape vineyard requires keen management and attention to details. New growers should attend to learn the specifics of vineyard establishment, variety selection and economics.

The cost of the workshop is typically $135 but has been reduced to $20 for Maryland residents thanks to subsidies from the Maryland Wineries Association and Maryland Grape Growers Association via the Governor’s Commission on Grapes and Wine. To take advantage of this reduced rate, registration must be received by February 10. Registration after this date or at the door will be $30, if space allows.

Offered in a classroom format, the workshop will present a broad overview of commercial vineyard development from pre-plant planning into the third year including economics and marketing information, and variety, clone, and rootstock choices, site selection and preparation, pre-plant decisions, equipment and supply requirements. The basics of ordering, planting, and tending the vines through the third year of growth, as well as best practices for training, canopy management, and pest management. There will be an opportunity for a vineyard demonstration at the end.

The workshop will take place at Deaf Independent Living Associates, Inc. in Salisbury, Maryland, 806 Snow Hill Road (Route 12) located in Wicomico County, from 8:15 a.m. to 4:30 p.m. For more information, visit: http://www.westernmaryland.umd.edu/viticulture.htm For more information contact Laura Hunsberger at 410-632-1972 or e-mail LHuns@umd.edu.
Upper Marlboro Research Vineyard Pruning Clinic
February 17, 2007

The University of Maryland Vineyard Team and the Maryland Grape Growers Association wish to invite you to attend the MGGA Upper Marlboro Research Vineyard Pruning Clinic to be held in February 17, 2007 from 9:00 a.m. to noon at the Upper Marlboro Research and Education Center located at 2005 Largo Road, in Upper Marlboro, Maryland. For more details and directions give me a call, or go to the MGGA web site at: http://www.marylandwine.com/

Mid-Atlantic Direct Marketing Conference
February 21-24, 2007, Solomons, MD

Mark your calendars...the Mid Atlantic Direct Marketing Conference (MADMC) is coming to Maryland in 2007!

Scheduled for February 21-24, 2007, in Solomons, Maryland, MADMC is a must for farmers and organizations that market agricultural products directly to consumers. This exciting event will take place at the Solomons Holiday Inn. For registration information contact Shannon Dill at the Talbot County Extension office at 410 822-1244.

WMREC Regional Fruit Meeting
February 22, 2007

If you are a fruit grower be sure to attend the WMREC Regional Fruit Meeting on February 22, 2007, at the Western Maryland Research and Education Center in Keedysville, Maryland. This meeting will provide Private Pesticide Applicator Recertification Credit. For details and registration contact Cindy Mason at the Western Maryland Research and education center at: 301 432-2767, Ext. 315.

Bay Area Fruit School
February 27, 2007

Attention all fruit growers! Plan to attend the Bay Area Fruit School on February 27, 2007 at the WYE Research and Education Center in Queenstown, Maryland from 8:30 a.m. to 4:30 p.m. This all day meeting will provide Private Pesticide Applicator Recertification Credit. For full meeting details and registration call Debbie Dant, WYE REC at 410 827-8056, Ext. 115.

Field Crops & Pasture IPM Workshop
March 12, 2007

Make plans to attend the Field Crops & Pasture IPM Workshop, Monday, March 12, 2007 at the Davidsonville Family Recreation Center (DFRC) from 6:00 p.m. to 9:00 p.m. This workshop will explore advanced concepts of pasture and field crop production in the Southern Maryland region from establishment to harvest, including animal utilization. Topics will include: Crop selection; integrated crop management; soil fertility; weed control; insect control; and disease control for soybeans, corn, wheat, barley and hay crops.

Private Pesticide Applicator Recertification & Nutrient Management Voucher Recertification will be awarded for full class participation.

To register for this event contact the Anne Arundel County Extension Office at 410 222-6759.

New On-Line Private Pesticide Applicator Recertification
April 19, 2007

If you would like the opportunity to learn from home, yet still be engaged, then be sure to enroll in the New On-Line Private Pesticide Recertification Training, scheduled for April 19, 2007 from 7:00 to 9:00 p.m.

This CENTRA recertification session will be live via the internet directly from the University of Maryland. CENTRA is a student interactive system that will document your attendance. To participate in a live CENTRA session a high speed cable or satellite internet connection is required.

Private Pesticide Applicator Recertification credit will be awarded for full 2-hour session participation. Registration by April 16 is required in order to receive CENTRA login password information.

To register for this on-line event contact the Anne Arundel County Extension Office at 410 222-6759.

Sustainable and Low Input Strip-Till and No-Till Vegetable Planting Tactics 2004-2006 Preliminary Report
R. David Myers®, Mark Spicknall, Alfred Hawkins
*Extension Educator
University of Maryland
Anne Arundel Cooperative Extension
7320 Ritchie Highway, Suite 210
Glen Burnie, MD 21061

Introduction

During the past three years field trials have been conducted at the University of Maryland Research and Education Center in Upper Marlboro, Maryland, examining strip-till and no-till vegetable planting techniques. The studies utilized cereal rye, and German foxtail millet cover crops, winter and summer annuals, respectively. A sustainable and low input protocol was followed to maximize time and economic investments, and to include soil conservation benefits of reduced tillage regimes. The vegetables included in these trials were direct seeded with a Monosem® no-till planter, with or without the strip-tillage prior to planting. An aggressive strip-tillage 12” wide by 6” deep was provided by utilizing a single row Ferguson® Rip-Strip Till implement. Leafy green vegetable crops were planted in the spring into cereal rye, and in the fall into the German foxtail millet. A burndown application of Gramoxone® to stop the cover crop growth was applied as required. For the leafy vegetable plantings no residual
herbicides were required, and an integrated pest management approach led to minimized usage of insecticide and fungicide applications. Full season summer planted vegetables were planted into a cereal rye cover, and followed similar study protocol with the addition of residual herbicides. The highlights of these studies will be reviewed, noting the benefits and challenges discovered during the investigations.

**Methods**

The research trials were conducted from 2004 to 2006 at the University of Maryland Research and Education Center in Upper Marlboro, Maryland, on a Monmouth fine sandy loam soil. The vegetable plantings were designed as randomized complete blocks, with four replications per treatment. The treatments consisted of the comparison of no-till versus strip-till of the following leafy greens and summer vegetables: Sugar snap peas var. *sugar bon*; collards var. *champion*; kale var. *blue curled Scotch*; turnips var. *purple top*; Chinese cabbage var. *pak choi* and *michilli*; radish var. *red globe* and *icicle*; lettuce var. *salad bowl* and *oak leaf*; Swiss chard var. *fordhook*; spinach var. *Tyee*; summer squash vars. *fortune straightneck* and *Seneca zucchini*; snap beans var. *jade*, sweet corn var. *Argent*; popcorn var. *South American yellow giant*; ornamental corn var. *Indian*; water melon vars. *crimson sweet*, *sugar baby* and *jubilee*; asparagus var. *Martha Washington*; and pumpkins vars. *autumn gold*, *Cushaw striped*, *bird house*, *Jack-Be-Little*, and ornamental gourd mix.

The fields utilized for the spring and summer vegetable plantings were tilled and drilled in early October with a 1.75 bushels/acre of rye in order to establish a heavy cover crop. At greenup in early March the rye cover received 30 lbs/acre of nitrogen. Each year a German foxtail millet cover was established in early June for the fall planted vegetable plots. The millet was seeded at a rate of 25 lb/acre utilizing a Tye Pasture Pleaser no-till drill. Four weeks after planting, 30 lbs/acre of nitrogen were broadcast applied to the millet cover crop plantings. The vegetables at planting received additional nitrogen, phosphorus and potassium fertilizers applied as required by soil test at rates recommended in the Extension Bulletin 236. Overhead sprinkler irrigation was supplied at planting and during the growing season as required to aid in stand establishment and avoid cessation of growth. All of the seed was treated at planting with Istofox® a planter box treater to control seedling damping of diseases, and soil insects.

In Table 1 the vegetable planting data guidelines for the study are provided. Included in this table were the study crop and variety selections; and target planting dates for spring and fall as applicable. For the spring planted vegetables and leafy greens (includes the bassicas, lettuce, radishes and spinach) the rye cover was strip-till, planted and sprayed with .75 qts/acre of Gramoxone® on April 8, 2004, April 26, 2005 and April 11, 2006. The spring plots were two rows alternating between strip-till and no-till, thirty-foot long, with four replications. The sugar snap peas were strip-till and planted into the rye cover without herbicides on March 4, 2006. For the sweet corn, popcorn and Indian corn plots the rye cover was strip-till, planted and sprayed with 0.75 qts/acre of Gramoxone® + 5.0 qts/acre of Prefar® + 1.5 pts/acre of Curbit® on May 14, 2004, May 11, 2005 and May 11, 2006. The rye cover was strip-till and sprayed with 0.75 qts/acre of Gramoxone® + 5.0 qts/acre of Prefar® + 1.5 pts/acre of Curbit® for the watermelon, pumpkin gourd and winters squash plots on May 14, 2004, May 17, 2005 and May 23, 2006, however, only the watermelons were planted on the same dates as strip-till and sprayed. The pumpkins, gourds, and winter squash were planted into the prepared cucurbit plots on June 16, 2004, June 6, 2005 and June 6, 2006. The summer squash bean plots, watermelons, pumpkins, gourds and winters quash plots were all two rows alternating between strip-till and no-till, thirty-foot long, with four replications. For the fall planted vegetables and leafy greens (includes the bassicas, lettuce, radishes and spinach) the German foxtail millet cover was strip-till, planted and sprayed with .75 qts/acre of Gramoxone® on August 20, 2004, August 19, 2005. Insect and diseases were controlled as required utilizing integrated pest management techniques, which included sprays based upon scouting thresholds and disease forecasts. All of the cucurbits received Admire® at vining for control of cucumber beetles.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Variety</th>
<th>Target Planting Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Spring</td>
</tr>
<tr>
<td>Sugar Snap Peas</td>
<td><em>Sugar Bon</em></td>
<td>3/1-3/12</td>
</tr>
<tr>
<td>Collards</td>
<td><em>Champion</em></td>
<td>4/7-4/24</td>
</tr>
<tr>
<td>Kale</td>
<td><em>Blue Curled Scotch</em></td>
<td>4/7-4/24</td>
</tr>
<tr>
<td>Turnips</td>
<td><em>Purple Top</em></td>
<td>4/7-4/24</td>
</tr>
<tr>
<td>Chinese Cabbage</td>
<td><em>Pak Choy &amp; Michilli</em></td>
<td>4/7-4/24</td>
</tr>
<tr>
<td>Spinach</td>
<td><em>Tyee &amp; Melody</em></td>
<td>4/7-4/24</td>
</tr>
<tr>
<td>Radish</td>
<td><em>Red Globe &amp; Icicle</em></td>
<td>4/7-4/24</td>
</tr>
<tr>
<td>Lettuce</td>
<td><em>Salad Bowl &amp; Oak Leaf</em></td>
<td>4/7-4/24</td>
</tr>
<tr>
<td>Swiss Chard</td>
<td><em>Fordhook</em></td>
<td>4/7-4/24</td>
</tr>
<tr>
<td>Sweet Corn</td>
<td><em>Argent &amp; Incredible</em></td>
<td>4/28-5/8</td>
</tr>
<tr>
<td>Popcorn</td>
<td><em>South American Yellow Giant</em></td>
<td>4/28-5/8</td>
</tr>
<tr>
<td>Ornamental Corn</td>
<td><em>Indian</em></td>
<td>4/28-5/8</td>
</tr>
<tr>
<td>Snap Beans</td>
<td><em>Jade</em></td>
<td>5/8-5/20</td>
</tr>
<tr>
<td>Summer Squash</td>
<td><em>Goldbar, Fortune Straightneck &amp; Seneca Zucchini</em></td>
<td>5/8-5/20</td>
</tr>
<tr>
<td>Watermelon</td>
<td><em>Crimson Sweet, Sugar Baby &amp; Jubilee</em></td>
<td>5/8-5/20</td>
</tr>
<tr>
<td>Pumpkins &amp; Winter Squash</td>
<td><em>Autumn Gold, Cushaw Striped, Bird House, Jack-Be-Little &amp; Gourd Mix</em></td>
<td>6/7-6/20</td>
</tr>
</tbody>
</table>
Observations
There were numerous observable and yield differences of note for this study. A summary in Table 2 highlights some of the yield measurements recorded to date. Yield measurements were taken in the portion of the plots where emergence was observed to be 85% or greater, therefore the difference associated may be attributed to the effect of tillage. Generally, the effect of weed control was similar between the strip-till and no-till plots except in 2004 more grass was present in the strip-till rows of the pumpkins.

Table 2. Vegetable Strip-Till & No-Till Yield Averages 2004-2006

<table>
<thead>
<tr>
<th>Crop</th>
<th>Variety</th>
<th>Yield lbs/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strip-Till</td>
<td>No-Till</td>
</tr>
<tr>
<td>Kale</td>
<td>Blue Curled Scotch</td>
<td>11,315a</td>
</tr>
<tr>
<td>Turnips</td>
<td>Purple Top</td>
<td>32,625a</td>
</tr>
<tr>
<td>Chinese Cabbage</td>
<td>Pak Choy</td>
<td>15,950a</td>
</tr>
<tr>
<td>Chinese Cabbage</td>
<td>Michili</td>
<td>20,300a</td>
</tr>
<tr>
<td>Radish</td>
<td>Red Globe</td>
<td>4,644a</td>
</tr>
<tr>
<td>Swiss Chard</td>
<td>Fordhook</td>
<td>7,975a</td>
</tr>
<tr>
<td>Sweet Corn</td>
<td>Argent</td>
<td>8,350a</td>
</tr>
<tr>
<td>Popcorn</td>
<td>South American Yellow Giant</td>
<td>4,900a</td>
</tr>
<tr>
<td>Ornamental Corn</td>
<td>Indian</td>
<td>10,527a</td>
</tr>
<tr>
<td>Summer Squash</td>
<td>Goldbar</td>
<td>15,518a</td>
</tr>
<tr>
<td>Summer Squash</td>
<td>Seneca Zucchini</td>
<td>23,413a</td>
</tr>
<tr>
<td>Watermelon</td>
<td>Jubilee</td>
<td>20,283a</td>
</tr>
<tr>
<td>Pumpkins</td>
<td>Autumn Gold,</td>
<td>12,524a</td>
</tr>
<tr>
<td>Gourds</td>
<td>Mixed</td>
<td>3,405a</td>
</tr>
<tr>
<td>Gourds</td>
<td>Birdhouse</td>
<td>14,422a</td>
</tr>
</tbody>
</table>

Preliminary Study Conclusions

- Response to strip-tillage may be variety sensitive.
- For most crops investigated in this study strip-tillage led to a 20% to 30% increased plant population at emergence than no-tillage.
- Strip-tillage warms the soil which provided a 15% to 35% yield increase in early spring planted leafy greens and vegetables.
- Strip-tillage eliminated the cover crop competition, which led to robust seedling growth.
- Early pre plant burndown (EPP) of the cover crop is recommended when soil moisture is limiting. During drought conditions EPP one week prior to planting for each foot of cover crop canopy.
- EPP of cover crop will also reduce the chance for seed germination inhibition due to allelopathy. No-tillage may be more cost effective for summer vegetables with fast germination and quick seedling growth.

Falling Number Test for Wheat
What Does It Mean?
Bob Kratochvil
Extension Specialist-Grain and Oil Crops
University of Maryland
Email: rkratoch@umd.edu

Wheat harvest was just getting underway on the Delmarva last summer when it happened. The “monsoon” season began. Excessive rainfall (9-15 inches plus) was reported throughout the region between June 25 and July 6. And, if it wasn’t raining the skies were still overcast and humidity remained high. The rains were a welcome relief for the region’s cornfields but that relief came with misgivings as farmers waited to harvest their wheat wondering what was happening to the quality of the crop that had been assessed as good to excellent just one week earlier. It wasn’t long after the combines started to roll, that we were hearing that wheat quality had been severely impacted by the rainy weather with reports that falling numbers were low. Accompanying these low falling number reports were truckloads of wheat being rejected at the elevators and mills.

To some, this was a new term or at least one that had not been heard for a number of years. “What the heck is a falling number was often heard?” The following will hopefully answer some of questions that have been on producers’ minds since last wheat harvest.

What is the falling number test?
It is a laboratory test that measures the level of sprout damage that has been incurred by wheat that has experienced weather conditions (like those during 2006 harvest season) conducive to pre-harvest sprouting. The American Association of Cereal Chemists is the authoritative organization that has produced a regularly updated 20+ page document that describes the procedures for this test.

What does the test measure?
It measures the amount of damage that the starch in the wheat kernels has endured during pre-harvest sprouting.

What is starch?
Starch is the primary component of flour. It is simply sugar molecules linked together to form long chains that are called either amylose or amylopectin (the two primary forms of starch in wheat). The type of starch is determined by the type of chemical bond the sugar molecules made when they linked together.

What kind of damage to starch can occur during pre-harvest sprouting?
When pre-harvest sprouting conditions are experienced, the wheat kernel imbibes (absorbs like a sponge) water, the first step in the germination (sprouting) process. Absorbing water triggers the release of an enzyme (alpha-amylase) that is stored near the germ area of the kernel. The alpha-amylase migrates throughout the starchy portion of the wheat kernel with

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one goal, to cut the long chains of starch into shorter segments of sugar that will be used to feed the sprout. An easier way to envision what alpha-amylase is doing is to think in terms of the Pac-Man video game. Alpha-amylase is the Pac-Man and the link between any two sugar molecules that comprise the long-chain starch molecules is the dot that the Pac-Man is eating. Once the dots are eaten on both ends of a sugar molecule, a free molecule of sugar exists. Too many free molecules of sugar in the flour are detrimental to the products that will be made from it.

**Why are too many sugar molecules in the starch (flour) a problem?**

Flour is the primary product obtained when wheat is milled. Based upon the class of wheat (hard red winter, hard red spring, soft red winter, durum, hard white, soft white) grown, a number of different end products can be baked each respective flour type. Wheat is best known for producing flour that is used for bread. Bread flour that has damaged starch (too many sugar molecules) caused by pre-harvest sprouting has its baking properties changed to the detriment of the end-product, the loaf of bread. For bread wheat, flour that has been damaged by pre-harvest sprouting will have reduced mixing strength, sticky dough, reduced loaf volume, and shorter shelf life.

**Does pre-harvest sprouting damage soft red winter wheat flour?**

The mid-Atlantic region produces soft red winter wheat. The flour milled from this wheat is used for cookies, cakes, flat breads, noodles, pretzels, batters, etc. Research conducted in Maryland during the early 90’s indicated that flour from soft red wheat that had been exposed to pre-harvest sprouting conditions would likely have less deterioration in its baking properties for some of its end-products than would occur for hard red wheat exposed to the same conditions. However, soft red wheat flour is not used solely for baking the various soft wheat products. Mills in this region will blend soft red flour with hard red flour for bread-baking purposes as well as other general use processes creating the need for sound soft red winter wheat with no pre-harvest sprout damage.

**How is the falling number test conducted?**

A sample of wheat is collected when the truck arrives at the elevator or mill. The sample is ground, a specific amount is placed into a tube and water is added creating a slurry. The slurry is stirred and heated to cause starch gelatinization (swelling). If sprouting has occurred, the sugar in the starch will cause the slurry to be less viscous (thick). A stirring rod is then dropped into the heated slurry and allowed to fall to the bottom of the tube. The length of time it takes for the rod to drop through the tube is the “falling number”. Wheat that has not been damaged by pre-harvest sprouting will have falling numbers greater than approximately 300 seconds. Severely damaged wheat may have falling numbers 60 seconds or less.

**How can pre-harvest sprouting be avoided?**

A wheat kernel does not know that it is destined to be milled for its flour. Instead, it is genetically pre-programmed to sprout and grow into a plant to produce the next generation. The only characteristic that can influence a variety’s susceptibility to pre-harvest sprouting is the length of its at-harvest dormancy period. Since this is a genetically controlled trait, the amount of at-harvest dormancy varies by variety. Some varieties are destined to sprout as soon as they have reached harvest maturity so when they experience weather conducive to pre-harvest sprouting they readily begin to germinate. Other varieties can endure short periods (a few days to a couple weeks) of pre-harvest sprouting weather after they have reached harvest maturity because their genetic code is telling them it is not yet time to germinate.

Unfortunately, breeding programs for soft red winter wheat do not routinely screen for pre-harvest sprouting resistance and susceptibility. So, there is no way for a farmer to know if the variety or varieties that have been purchased for production on his/her farm are susceptible or resistant to sprout damage until it is too late. If the level of susceptibility was known, those varieties that are most susceptible could be harvested first. However, when a harvest season like the one experienced during 2006 occurs, there is little that can be done even when a variety with reasonable resistance/tolerance to pre-harvest sprouting is grown. This leaves only one option, hope that the harvest season is sunny and warm allowing timely harvest of the crop. Fortunately, most of our wheat harvest seasons are not accompanied with a week to 10-days of rainy weather.

**2006 State Corn Performance Test Report**

The final version of the 2006 State Corn Performance Test Report has been posted on the Cropping Systems website: [www.mdcrops.umd.edu](http://www.mdcrops.umd.edu)

**Roundup Ready® Alfalfa for Dairy Protein or Thoroughbred Horse Hay**

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Much has been written on and many have talked about concerns and costs for Roundup Ready® alfalfa. The technology can add significantly to the initial establishment cost for a very valuable farm-produced protein source. The dairy farmer/operator must decide if the benefits in terms of weed control, initial stand establishment (ease, stand density, and reliability) exceed the cost of the technology at today’s milk price. Following are some of the factors that a grower should consider when making the decision.

Companion crops, such as oats, have often been used to suppress weeds in newly-planted alfalfa fields. A number of research reports have suggested that there are negative consequences when companion crops are used especially if weather-related stresses occur early in the establishment phase. By switching to a Roundup-Ready alfalfa variety, stand density can be improved as
well as increasing the likelihood of a successful seeding. Consistent, reliable elimination of weed competition by using Roundup-Ready alfalfa can reduce the risk of seeding failure from factors such as drought.

Up to now after initial establishment of conventional alfalfa, the most severe weed-related problem has been competition from late-season annual grasses (foxtails, crabgrass, and fall panicum). Alfalfa stands can be severely impacted by late-season annual grasses with stand longevity reduced by 1 to 3 years. This problem is most severe during periods of summer drought. Many producers either ignore the problem or do not identify the problem early enough to prevent alfalfa stand and yield losses. And, too often, an annual grass problem is not recognized until the grass is much larger than the recommended size for glyphosate control. As more producers adopt Roundup Ready alfalfa and this problem affects the new stands, growers must keep in mind that other grass materials are available to control annual grasses and should be employed just to rotate herbicide mode of action to prevent the development of glyphosate resistant weeds.

In situations where other Roundup Ready crops are part of a field's rotation and a glyphosate product is routinely applied, do not plant Roundup Ready alfalfa because it will be too easy and tempting to choose to make additional glyphosate applications. In the mid-Atlantic region, weeds such as marestail have developed resistance to glyphosate. Since there are alternative herbicides available for alfalfa, it is strongly recommended that non-Roundup Ready alfalfa varieties be used in rotations or fields where other Roundup Ready crops are part of the rotation.

Fields with perennial weeds or heavy weed seed banks are ideal candidates for Roundup Ready alfalfa. In these cases, when you rotate back to corn silage, choose a non-Roundup Ready corn hybrid and use a conventional herbicide program to help minimize the risk for glyphosate-weed resistance.

For fields where you expect light to moderate annual weed pressure at alfalfa planting time and there are no hard-to-control perennial weeds present, Roundup Ready alfalfa may or may not be the appropriate choice depending on economics. Research has noted that the use of Roundup Ready alfalfa can help ensure an excellent initial stand of alfalfa and minimize competition from weeds. Alfalfa seedlings often establish slowly and can be sensitive to the competitiveness of annual weeds. Research has shown that early weed control during establishment can reduce the level of stress on alfalfa (water, light, nutrients), increase seedling weight and leaf number, and improve first year following establishment yields. An improvement in leaf number and stand density (higher leaf to stem ratios) can indicate improved digestibility, crude protein, and feed value for dairy cattle and therefore help producers recover some of the initial investment cost of Roundup Ready alfalfa. Glyphosate should be applied to seedling alfalfa at the 3 to 5 trifoliate leaf stage and when weeds are less than 4 inches tall to maximize alfalfa competitiveness and establishment.

When producers are growing pure alfalfa for the thoroughbred horse hay market where it is critical to produce alfalfa hay that is free of noxious, low-quality, and potentially poisonous weeds, Roundup Ready alfalfa can add significant value. Typically, no single herbicide, including Roundup, controls all the weeds present in many alfalfa fields but with proper herbicide timing and management glyphosate can help minimize weed problems in these fields.

Industry data indicate that yield in the first few years of the stand's life can help pay for the increased seeding costs when using Roundup Ready alfalfa. However, there are also conflicting reports that suggest longer pay back periods so when first adopting this technology start with small acreage and keep track of expenses so you can evaluate the benefits versus costs.


### Understanding Cation Exchange and Percent Base Saturation

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We often talk about cation exchange capacity and percent base saturation in the soil but I wonder how many folks really know what is meant by these terms and whether they really impact a farming operation. Depending on where you have soil tests done, you may receive a soil test report that will describe your soil's cation exchange capacity in units called either milliequivalents per 100 grams of soil (meq/100g or just meq) or centimoles per kilogram of soil (cmol kg⁻¹ or just cmol). The soil test results also may list the percent base saturation for calcium (Ca), magnesium (Mg), and potassium (K) [sometimes sodium (Na) is also reported] plus your soil's exchange acidity. So just what do all these numbers mean?

Let's start with cation exchange capacity (CEC). Plants produce hydrogen ions (H⁺) and bicarbonate ions (HCO₃⁻) in their roots where they are available for exchange with the soil. So, envision a crop plant's roots covered mostly in hydrogen ions with a scattering of bicarbonate ions. These ions on the roots are called cations if positively (+) charged and anions if negatively (-) charged. They can be exchanged for other cations or anions that are either free-floating in the soil solution (the water in the soil) or are attached loosely to exchange sites on either soil clay particles or soil humus (organic matter) particles. Cations and anions can have one or more charges (+ or -) associated with the ion and generally the more charges the stronger the attraction to the soil or OM exchange sites. As plants take up cations such as calcium (Ca⁺), magnesium (Mg⁺⁺), potassium (K⁺), manganese (Mn⁺⁺), zinc (Zn⁺⁺), copper (Cu⁺⁺), ammonium (NH₄⁺), and others from either the soil solution or from the exchange sites on clay or humus particles, an equal number of hydrogen ions (+ charges)
are released into the soil solution or are added to the exchange sites on the soil particles. The hydrogen ions are what add acidity to the soil so as acid is added and basic cations are removed from the soil, the soil solution gradually becomes lower in pH or more acidic. Soils, especially heavier soils or soils with more soil organic matter (SOM) can buffer or modify the addition of the acidity so the pH does not decline as fast as it would on very sandy, low organic matter soils. Nevertheless, with time the soil gradually acidifies and requires the farmer to replace the basic cations lost by adding limestone. For soils with low buffering capacity, typical of the sandy soils on the coastal plains, more frequent but smaller additions of limestone will be needed to keep the soil pH in a desirable range.

The soil's CEC is measured in units that account for the number of positively-charged ions that can be held on the soil particles. Although the units can be expressed differently (meq or cmol), they have equal value. As a soil manager interpreting the soil test result, the greater the CEC number is, the better able the soil is to store enough cations for crop growth. How do we improve a soil's CEC? Since we cannot increase the amount of clay in the soil to improve CEC, the only option available is to increase the amount of soil organic matter or humus over time. Humus has the highest concentration of cation exchange sites per gram so even small changes in SOM can have significant beneficial effects on cation availability to crops. Using cover crops, planting no-till, reducing the number of tillage operations, and adding manure or compost products to the soil are ways to gradually build SOM and CEC.

Now let's address those negatively-charged ions called anions such as sulfate (SO₄²⁻), nitrate (NO₃⁻), chloride (Cl⁻), molybdate (MoO₄²⁻), and orthophosphates (HPO₄²⁻ or H₂PO₄⁻) that are absorbed by the plant roots. When these anions are absorbed by the roots, there is a release from the roots of the same number of negatively charged bicarbonate (HCO₃⁻) ions. A small quantity of anion exchange sites exist on most soils in this region making it unusual for soil test reports to even mention anion exchange capacity (AEC). But, it is measured in the same units as CEC. Since the soils in this region have so little AEC, the anions such as nitrate and sulfate often are leached out of the root zone especially on sandy soils. Still, the mechanism at work for cations does apply to anions to some degree.

If cation exchange is a way to measure the ability of the soil to supply positively-charged ions to crop plants, what does percent base saturation signify? Percent base saturation describes the percentage of the soil’s exchange sites that are occupied by the basic cations (Ca, Mg, and K are the ones normally reported but you might sometimes see Na saturation reported). To calculate the percentage of the cation exchange sites occupied by each of these cations, the soil testing laboratory mathematically calculates the number of units (meq or cmol per unit of soil) of each basic cation and then calculates the relative proportion of the CEC that is occupied by that cation. The methodology and calculations are not as important as having percent base saturation for Ca, Mg, and K in the optimum range.

For Ca, the usual range is from 40 to 80% and is quite wide. If the soil pH is adjusted to a level that is desirable for the crop and soil type, anywhere within this range generally will result in good crop performance. Magnesium base saturation usually ranges from 5 to 15%. For K, the range can be from 1 to 5% although some soils with low CEC require the range to be held from 3 to 5% to ensure enough K for crop growth. Since lime is relatively inexpensive compared to adding an equivalent amount of K, the percent base saturation for Ca and Mg is more economically adjusted. As long as your soil test report states that there is an adequate amount of Ca, Mg, and K for crop growth and the soil pH is optimal, the exact proportion of the exchange sites occupied by each cation is not that important. The only one that might concern a dairy farmer is K which if too high can cause problems such as milk fever. This is related to the dietary cation-anion difference or DCAD which is the balance of the cations K and sodium to the anions sulfur (S) and chloride (Cl). While lactating cows need a positive DCAD (more cations than anions), dry cows during the last 3 to 4 weeks of pregnancy need a negative or anionic DCAD. Of the four minerals in DCAD, K is generally available in the forage in the greatest quantity and varies with forage grown and soil available K so it has the most influence on DCAD. Since the recent price rise for K fertilizers, growers are less likely to fertilize with K routinely and therefore soil K levels may decline in the future. This should result in fewer problems with high K soil levels unless fields are heavily manured.

I hope this gives you a little better understanding of cation exchange capacity and percent base saturation. If you have specific questions, please feel free to email the author at rtaylor@udel.edu.

Questions and Answers Concerning Fescue Endophyte Toxicosis

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What is fescue endophyte toxicosis?

Following the widespread planting during the 1940's and 1950's of a tall fescue ecotype released as "Kentucky 31", a number of problems began to appear in research reports as well as the popular press. The forage was relatively low in palatability to livestock, and the performance of animals grazing it was erratic and often disappointing low. Cattle grazing fescue occasionally developed lameness and sometimes lost portions of feet or tails during the fall and winter months. This infrequently seen syndrome became known as “fescue foot”. Cattle sometimes develop deposits of hard fat in the abdominal cavity, referred to as "fat necrosis". This problem is associated with heavy applications of broiler litter or nitrogen fertilizer to fescue pastures.

The disease called fescue endophyte toxicosis is characterized by grazing cattle showing a chronic unthrifty condition that becomes most noticeable during the summer months. Many terms have been applied to...
Neotyphodium endophytes that produce toxins have not been observed to date.

**Which domesticated animals are affected by the disease and what symptoms are seen?**

Problems with fescue toxicosis have been reported in dairy cattle, beef cattle, sheep, goats (dairy, meat, and pygmy), and horses consuming endophyte-infected pasture, green chop, hay and/or seed. For cattle, the symptoms are well known and include reduction in weight gain, heat stress susceptibility, higher body temperatures and respiration rates, reproductive problems, reduced (serum prolactin levels) milk production, rough hair coat, reduced feed intake, excessive salivation, more time spent in the water or shade, less time spent grazing, and necrosis (sloughing off of hooves, tips of ears, and tail usually associated with higher body temperatures). Research suggests that for each 10% increase in endophyte level a reduction of 0.1 pound in average daily gain occurs in growing beef animals. As with most toxins, symptoms are dose dependent with greater effects evident at higher infection rates (dosage levels).

An interesting observation on cattle grazing toxic endophyte tall fescue was a reduction in serum (blood) copper concentrations and visual symptoms of copper deficiency (coat condition and hair color). There is speculation that toxic endophyte-infected plants may restrict translocation of, preferentially bind to, or restrict availability of metal ions (in particular copper, selenium, zinc, and selenium). This action by the fungus may reduce forage quality and result in some of the animal symptoms seen. Supplementation of some of these metal ions has been tried although the results do not indicate a complete reversal of fescue toxicosis symptoms.

The effect that grazing infected tall fescue has on horses, especially brood mares, and cattle is well known. Sheep appear to be less affected by the endophyte in tall fescue, but are still prone to problems, especially reduced weight gains due to reduced intake of the forage. Less is known about goats. Several universities have initiated studies to determine the effect that grazing infected tall fescue has on the performance of meat goats.

Problems with tall fescue toxicosis have been noted in some of the exotic animals such as water buffalo, llamas, and alpacas. Information available on American bison does not indicate a significant problem there; but for many of the exotic animals, tall fescue does not constitute a large portion of their diet. It is likely that any ruminant or modified ruminant species that consumes adequate levels of the toxic alkaloid(s) will be affected especially during reproduction.

**How widespread is the disease?**

Of the tall fescue fields tested in the U.S., over 90 percent contained the endophyte. Information from The Fescue Diagnostic Center at Auburn University indicated that the average infection level for samples from 28 states and several foreign countries was 62 percent. The problem occurs in almost all tall fescue growing areas in the country. Back in 1993, the cost of fescue toxicosis to
livestock producers was estimated to be over $600 million per year.

**Where is the endophyte found in a plant?**

The hyphae or body of the fungus is only found between the cells (in the inter-cellular spaces) of the plant tissues and never outside the plant. Since infection begins as an infected seed germinates and begins growth of a new plant, the fungus becomes established in the meristematic region of the new plant and spreads into each new bud or tiller as it forms.

Although the actual mechanisms are not fully understood at this time, it is thought that the fungus is being “carried” by each leaf or stem emerging from the meristem. Since it has been noted that there can be a decreasing endophyte concentration towards the leaf tip during periods of rapid plant growth, it is thought that the fungus doesn’t always grow fast enough to keep up with rapid plant growth. Hyphae are carried upwards with the developing stem/seedhead and eventually proliferate inside the ripening seed completing the infection cycle for the next generation.

**Does the endophyte spread in a field or from field to field?**

Tall fescue endophyte is only spread through infected seed and not from root to root contact. For the endophyte to spread in a field, viable infected seed must be produced so management techniques that prevent plants from producing seed heads or ripening seed are effective in preventing endophyte spread. Endophyte infected fescue can spread into a field from an infected neighboring field only if the field is allowed to produce viable seed, the seed from these fields is infected, and the seed is transported to the neighboring field and manages to germinate and establish an new seedling/plant. Good management of the field should maintain a vigorous grass stand that will prevent the establishment of new plants from seed transported to the field. In fact, reports from Auburn University indicate that an endophyte-free fescue stand separated only by a fence from an infected field was still endophyte-free after a 10-year span.

It may be possible for manure applications to spread tall fescue endophyte into a field but only if infected viable seed is present in the manure and the seed is able to establish new plants in the field. Feeding hay from infected fescue fields can also help spread the endophyte but again only if the hay contains viable endophyte infected seed. To prevent spread, hay buyers should be certain that hay containing tall fescue does not contain seed heads with viable seed.

**In what part of the plant does the endophyte exist?**

**Meristem**—Although the concentration of hyphae is likely highest in the plant meristem or crown region, this area is so small as to make measurements impractical. Thus when standard infection tests (staining hyphae are run, the measurements are made in the base of a fescue tiller usually within 1-inch of the crown. This also means that overgrazing or very close grazing can decrease animal performance by increasing alkaloid uptake.

**Sheath (pseudo-stems)**—In vegetative tall fescue, the grass sheaths generally contain the most endophyte. In tall fescue, the distribution of the endophyte and alkaloids are closely related since ergovaline (one of the alkaloids produced by the endophyte) has a low water solubility.

**Leaves**—Hyphae are often sparse in tall fescue leaves especially towards the leaf tips. There can be some variation in the abundance of hyphae in the leaves based on plant genotype-race interactions with hose combinations having the best match showing hyphae in the leaves.

**Roots**—Endophyte hyphae have not been found in the roots of tall fescue.

**Stems and Seedheads**—Hyphae of *Neotyphodium* and especially the alkaloids are concentrated in tall fescue seedheads. Grazing flowering tall fescue (late spring and summer) can be toxic to livestock and classes of livestock that preferentially consume seed and seedheads can be severely impacted. Understocking, mismanagement, failure to mow pastures to remove seedheads, or failure to drag pastures to prevent selective grazing can lead livestock to consume seedheads and decrease animal performance. In this situation, a test to determine the percentage infection rate will not accurately predict livestock performance. Only measurements of alkaloid concentration (in consume plant parts or in urine) will predict performance.

**Seed**—The endophyte is a seed-borne fungus. Consumed infected seed is likely to have the highest alkaloid concentration. The endophyte in seed is short-lived and viability of the fungus is significantly lowered after 1 to 2 years so prior to planting tall fescue seed an endophyte test should be conducted on the seed. This test should be no more than 2 or 3 months before the seed will be used. For toxic endophyte seed, the goal is to identify seed with the least viable infection rate whereas for novel, non-toxic endophyte seed the goal is to identify seed with the highest viable infection rate. For endophyte-free seed, the ideal seed is zero infection. A negative test will be valid forever. Always save a sample of any seed sown and store it frozen at 0° F. to reduce deterioration of endophyte viability with time.

**Hay and Silage**—The endophyte remains in stored forages even after harvest although viability can change. Endophyte presence/viability is not as important as the amount of alkaloid present in the forage. Alkaloids are reported to be relatively stable and toxic during silage storage. For hay that has been ammoniated, there is some indication that alkaloid concentration may decrease during hay making. To test potential toxicity, measure the concentration of ergovaline using HPLC.

**When should I test my pasture?**

There is an annual cycle to endophyte and alkaloid levels but is relatively stable among days and years. Winger and spring show the lowest infection levels so avoid sampling from late fall to late spring. Summer and early fall are the best times to sample fields.

For alkaloid concentration, leaf and pseudostem levels generally peak about May, stems and seedheads in July. Alkaloid levels remain generally level from after flowering until November.

Sampling for endophyte should occur about 1 to 2 years after planting followed by resampling every five years or after likely contamination events. Sampling
What are the likely contamination events?

Contaminated seed—Always have a seed test to determine endophyte viability within several months of seeding. If a significant number of fescue plants mature seed in a field or in areas near the field, contaminated seed could be added to the soil seed pool.

Imperfect kill of prior stand—Since tall fescue has underground rhizomes, cultivation often does not kill all plants. Herbicides also do not always achieve 100 percent kill. Recommendations call for a minimum of a 2-year exclusion from tall fescue before replanting tall fescue seed.

Buried seed—Whenever endophyte-free tall fescue is established in a pasture or hay field that previously contained tall fescue, there is the potential for contamination of the stand from buried seed left over from the previous tall fescue stand. To help limit the potential contamination, the field should be managed to prevent seedhead formation at least for the prior year. Some researchers have reported that tall fescue seedlings were eliminated after 18 to 24 months of burial.

Seed spread in manure—Tall fescue seed can survive passage through the digestive tract resulting in viable seed in the manure. For grazing animals, do not feed contaminated hay or silage or allow animals to graze on contaminated pasture within 72 (minimum 48) hours of moving animals to clean (non-contaminated) tall fescue stands.

Seed spread by hay—Most spring-cut hay contains some viable seed. Hay made from old fescue stands or meadow fescue stands should be considered contaminated.

Drought—There is some evidence that severe drought can potentially increase endophyte levels possibly due to the competitive advantage given infected plants. It is recommended that endophyte levels be checked on tall fescue fields one year after a severe drought.

Other sources—These can include wildlife and machinery that can transfer viable infected seed into ‘clean’ pastures. Dispersal range of tall fescue is unknown at this time so to minimize the risk of transfer of contaminated seed nearby tall fescue fields (and borders and rights-of-way) should be mowed or grazed to prevent seedhead production.

Both nitrogen and phosphorus fertilization can increase endophyte and ergovaline levels. If fertilization levels are significantly increased, test pastures after the five year period.

Where can I have my tall fescue tested?

A number of labs test for endophyte and some test for ergovaline levels. Refer to page 10-11 in chapter 7 of a list of labs in “Tall Fescue on-line Monograph” at the web address below:

http://forages.oregonstate.edu/is/tfis/book/print.cfm?Chaper=7

What level of infestation is critical or economically important and how are tests conducted?

This must be determined by the individual producer based on infection level, predicted animal performance, animal product value, and estimated cost of renovation. Research suggests that for each 10 percent increase in toxin-producing endophyte level a reduction of 0.1 pound in average daily gain occurs in growing beef animals. For lactating dairy cows consuming endophyte-infected fescue (non-novel) during summer, a 37 percent decrease in milk production was reported by scientists at the University of Kentucky. Highly infected fescue has been shown to reduce pregnancy rate in beef cows by 30 to 40 percent. For high value animals such as thoroughbred horses, most growers prefer to avoid fescue completely.

Again, novel endophyte tall fescue has complicated a discussion of economically important infection levels. High infection rates are preferred in novel endophyte fescue fields since the endophyte does bestow benefits on the tall fescue that can translate to greater animal performance during the summer months. Again for reproducing high value animals, many owners still prefer not to use even the novel endophyte fescue. Research is underway to better access the risks involved in using novel endophyte infected varieties for horses.

A better evaluation of infection level, involves evaluation of the toxicity potential. There are several methods used although commercial availability is limited at this point. One method involves liquid chromatography or HPLC and is a quantitative measure of ergovaline concentration. Ergovaline is one of the ergot alkaloids produced in tall fescue by the fungus. A concentration of ergovaline above 150 ppb (microgram per kilogram) can be toxic to livestock. Another method for measuring alkaloid concentrations is by ELISA which has distinct advantages over HPLC since ELISA tests for total ergot alkaloids and not only for ergovaline. Since investigation of the specific alkaloid or alkaloids responsible for fescue toxicosis is still on-going, detection of total ergot alkaloid levels provides a better indication of potential toxicity.

Although not available commercially at this time, another option rather than plant based measurement is urinary excretion of ergot alkaloids as measured by ELISA. Animal performance has been found to be inversely proportional to animal performance. The animal test can be designed as a qualitative (are toxic levels present or not) or quantitative measure.

Are there any management techniques that can be used to reduce the impact of an infected pasture on an operation?

Several management options are available when pastures are infected with the toxic-producing endophyte. Providing supplemental livestock feed to augment weight gain can reduce the effect on livestock. Also, legumes or other grass species can be interseeded into an infected pasture to dilute the effect of the endophyte. These options reduce the symptoms but do not solve the problem since infected tall fescue remains infected. Frequent mowing can help keep the fescue in the vegetative stage although close grazing or mowing should be avoided. Irrigation during the hot summer months can reduce the plant stress and possibly minimize ergot alkaloid levels.

Before deciding on the best option for dealing with toxin producing endophyte-infected fescue, a producer should determine the level of endophyte in each pasture or field. Information on the procedures to follow
when testing a field is covered above. The correct approach for each field must be determined based on infection rate, grazing pressure, moisture stress potential, and on numerous other individual field characteristics. There are four general approaches to managing existing infected fields.

The first approach involves managing to minimize the effect of the endophyte on grazing animals. All methods of grazing and/or clipping management that maintain fescue plants in a young and vegetative state will improve animal performance. If fescue is cut for hay, it should be cut when fescue is in the boot stage (the seed head is not yet visible but can be found within the leaf whorl). Other practices designed to improve overall pasture quality will also improve animal performance even on infected pastures. These practices include fertilization, pest control, creep grazing, rotational grazing, irrigation, and overseeding or no-till seeding of legumes.

The second approach involves avoiding the endophyte. If infected forage must be used it should be used in spring and fall when fescue quality is higher. Other grasses or grass-legume mixtures should be used for summer grazing since fescue forage quality is generally low during the summer months. Infected fescue hay can reduce animal performance so manage fescue hay fields to obtain the highest quality hay possible. When possible, feed hay of another species instead of fescue hay or feed with fescue hay to dilute the effect of infected fescue hay. The third approach is to dilute the endophyte. The endophyte or its products can be diluted through the use of supplemental feeds. Infected fescue pasture can be improved by interseeding legumes into the field. Animals can also be pastured part of the time on non-fescue pastures or have other feeds added to their diet. The final approach is the destruction of infected fescue stands and replanting non-toxic, novel endophyte seed, endophyte-free fescue seed, another grass or grass-legume mixture, or a combination of clean fescue seed plus a legume. For clean fescue seed, only seed from seed lots with less than 5 percent infection rate should be used to seed or reseed fields. If an infected fescue field is replanted, it should not be allowed to produce seed during the reestablishment year (and preferably at any time). This prevents the development of volunteer infected plants. The fescue endophyte usually dies within 1 to 2 years in seed, so if seed production is prevented for several years, volunteer plants from old seed in the soil should have a very low level of endophyte infection.

**Nematode Control Recommendations for Southern Maryland Vineyards**

**November 2006**

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Nematode control is important to prevent disease transmission and poor growth. Nematode populations need to be monitored and controlled if populations reach potentially harmful levels. See Appendix 1 for a nematode population threshold chart adapted from Virginia Tech. There are numerous effective options to control nematodes including:

**Soil Fumigants:** Products such as Telone II, Telone C-17, Methyl Bromide, and Vapam. These products are applied to the site with special application equipment, incorporated in the soil, and finally sealed at the site with plastic or firming the soil. After application, the fumigant forms a gas which effectively kill nematodes, and other soil organisms such as insects, weed seeds and soil pathogens. Soil preparation and application are critical to successful pest control with fumigants. Methyl bromide was widely used in this area for tobacco bed preparation; however it is no longer available for individual use. There is a company that will apply the Methyl bromide at a cost of approximately $2000.00 per acre. We are not recommending the use of soil fumigant because of their cost and difficulty in application over a large area.

**Soil Applied Nematicides:** These are products somewhat similar to fumigants, however are only effective against nematodes and in some cases other insects. Examples of these products are Nemacur, Vydate, Furadan, Mocap and others. Nemacur is the only product labeled for use in grapes after planting. Nemacur can be applied to both bearing and non-bearing vineyards after planting. The Vydate label states “Do not plant crops other than those with registered Vydate L or Vydate C-LV uses within 4 months after the last application”. For specific application instructions view the product labels at the following URLs Vydate at:
http://www.cdms.net/ldat/ld68N001.pdf
and Nemacur at:  http://www.cdms.net/ldat/ld68N001.pdf

**Bioremediation:** The use of Sudan grass in combination with Rape is another effective method for control nematodes. This process requires 2 years to complete. The rape plant is mowed and immediately incorporated in the soil, where it releases a gas very similar to the soil fumigant Telone. Given our time table and the high nematode numbers, we are recommending the use of Nemacur versus the Rape/Sudan grass option. If you are planning future plantings, this option should be considered.

**Note:** When using any pesticide remember to always read and follow the label.

We are recommending those growers with nematode populations above the threshold limits consider the following recommendations:

**Option A:** Apply either Nemacur of Vydate now, as a fall application. Application is preferred as a broadcast application over the entire field to be planted. In order to be effective these products must be carried down into the soil profile, which can be achieved by the either of the following two methods:

1) Applied and mechanically incorporated with a harrow, disc, or other tillage implement.
2) Applied and watered in with low pressure irrigation system or rain event. The fall application has a number of advantages. First, scheduling planting, trellis construction and pre-plant nematicide application in the spring will be difficult. A fall application can be made
while the soil temperature is still adequate (above 55 F). Second, soil preparation is very important for these products to work effectively. Soil should be loose and friable, free of clods and heavy residue, and worked to an appropriate depth. The product must be able to move through the soil to reach the nematodes. A fall application provides easier access the row middle and may improve soil preparation in the immediate planting area. Finally, growers have a wider array of products to use in the fall than in the spring pre or post-plant.

**Option B**: Application of Nemacur after planting. (Mid-May time frame would allow the soil to warm adequately and for the vines to begin to establish) Nemacur can be applied through a low pressure irrigation system such as drip system or may be applied over the row with a nozzle type boom/wand sprayer. The rate for banded application is 1-2 gallons per acre, which would equate to 1 gallon per application for 1 acre of grapes with only a band application over the row. In mid summer, growers can re-sample for nematodes and consider another application if needed.

Growers wishing to apply Nemacur or Vydate will need to obtain a MD private pesticide applicator license this winter. We will have training opportunities and will be hosting the applicator exam this spring. Growers may also want to communicate about networking on the use of a sprayer and on purchasing the chemical.

**Note**: Nemacur will only be sold through May 2007 with use of the product allowed until stocks are depleted.

Dagger nematode is a concern because it serves as the vector for Tomato Ringspot virus. Therefore, low populations can transmit the disease. Dagger is slow to rebound after a population is killed or suppressed. The other important step to decreasing virus transmission is to practice good broadleaf weed control after the vineyard is established. Many broadleaf weeds serve as host for the virus, which can be blown in on weed seeds (seed borne). It is also noteworthy that sites with past cropping history of annual crops with good weed control and past monocot crops are at a much lower risk of Tomato Ringspot Virus being present on weeds in the field.

The other nematode species cause direct injury to the plant roots. High numbers of these species can cause vine decline or death if not controlled.

**Appendix 1: Grape Nematode Threshold Densities**

Adapted From: Department of Plant Pathology, Physiology and Weed Science, Virginia Tech University at:

http://www.ppws.vt.edu/~clinic/thresholds.html

**Recommendation Codes:**

A. Production of the crop to be grown should not be affected by nematodes.
B. Nematodes may cause crop damage if growing conditions are unfavorable. A nematocide may be profitable.
C. Nematodes will probably cause crop damage and a nematocide should be profitable.

**MDA Announcement**

Board of Public Works Approves $147,000 in Grants to Support Wine Industry: A Second Set of Awards from the Maryland Wine and Grape Promotion Fund

Governor Robert L. Ehrlich, Jr. announces that the Board of Public Works approval of two grants totaling $147,000 in state funding from the Maryland Wine and Grape Promotion Fund to the Maryland Grape Growers Association and the Maryland Wineries Association.

The Fund was established in 2005 to promote the production and consumption of Maryland wine and the increased production of grapes in the state. The grants will be used for a variety of projects including marketing, research, advertising, retail/festival promotions, activities that promote the growing of wine grapes, and educational seminars. The Board is comprised of the Governor, Treasurer Nancy K. Kopp, and Comptroller William Donald Schaefer.

"Through the Maryland Wine and Grape Promotion Fund we are helping to support Maryland's wine and grape growing industries-an increasingly important component of Maryland's economy," said Governor Robert L. Ehrlich, Jr. "By supporting the development of highly profitable agricultural sectors, such as our rapidly growing wine industry, we are helping to keep farmers on the land and making Maryland a better place to live and to visit."

In 2005, Governor Ehrlich authorized the creation of the Governor's Advisory Commission on Maryland Wine and Grape Growing and the Maryland Wine and Grape Promotion Council. The Commission is made up of seven members appointed by the Governor from the industry, the research community, and state Government, and two members appointed by the President of the Senate and the Speaker of the House. The Council is comprised of the secretaries of the Maryland departments of Agriculture, Budget and Management, and Business and Economic Development. It is the responsibility of the Council, upon advice from the Commission, to recommend to the Board of Public Works how grants from the Maryland Wine and Grape Promotion Fund shall be allocated. To date, $250,000 has been made available through the Fund in two fiscal years.
SMRFM's HAY AUCTION HIGH LOW REPORT

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<th>High Price</th>
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You may view a copy of SMRFM's hay auction's high/low reports on our website at:
http://www.geocities.com/smrfm/highlowreport.html

Maryland AgrAbility Project
Ruth K Miller, Family Consumer Scientist, Retired
University of Maryland

When disability strikes a farm family, everything changes except perhaps the desire to continue farming. The AgrAbility Project may be able to educate and assist disabled farmers, farm workers and watermen so they can continue to lead successful career in agriculture. Debilitating conditions such as amputation, arthritis, stroke, respiratory problem, back pain and other conditions may keep farmers from doing necessary work on the farm.

AgrAbility can bring assistive technology to the farm by finding the right adaptations for specific needs. Every day new devices and methods are developed to make independent living and working possible and easier.

If you are a disabled farmer or waterman, call Dave Myers at the Anne Arundel Cooperative Extension at 410-222-6759 to find out if you are a candidate for assessment by the AgrAbility Project of Maryland. The Maryland Cooperative Extension, USDA and Resources for Independence are partners in this project.

Grain Market Report
Carl L. German, Extension Crops Marketing Specialist
University of Delaware

Strong Export Pace Reported
U.S. corn exports were reported at 1,264,900 metric tons (49.8 million bushels), well above the 750,000 mt (29.5 mb) needed this week to stay on pace with USDA's projection of 2.2 billion bushels for the '06/'07 marketing year. U.S. soybean exports were reported at 742,000 mt (27.3 mb), well above the 351,399 mt (12.9 mb) needed to stay on pace with USDA's projection of 1.145 bb for the '06/'07 marketing year. U.S. wheat sales, reported at 455,100 mt (16.7 mb), were also above the 350,600 mt (12.9 mb) needed this week to stay on pace with USDA's 900 mb projection, bear in mind that USDA trimmed the projection for U.S. wheat sales by 25 mb in the December sully/demand report. Over all the report should be viewed as neutral to bullish.

Year End Market Summary
The trend in the corn market remains up with record net-long futures positions and contracts near 10-year highs. In '07, depending upon the acreage switch for U.S. corn and the eventual yield per acre (140, 150, or 160 bushels) will determine how high corn prices can go? Ideal weather and record/near record yields can be viewed as bearish for corn. However, the trade will not be able to tolerate even the slightest suggestion of any adverse weather or prices will need to seek demand rationing levels. The corn market will be extremely volatile for months to come. The trading range for Dec '07 corn futures is expected to be down 20 cents up $1.00/bushel for months to come.

With U.S. soybean acres possibly down 5 million acres next year, stocks will be cut in half, assuming 41.5 bushels per acre. If yields are somewhat better for the '07 crop then stocks would be adequate for the '07/'08 marketing year. However, in '08 the U.S. will need to produce more beans, or prices will move to rationing levels. In 2008, if the U.S. does not find more soybean acres then the way will be paved for huge acreage increases in Brazil. Nov '07 soybeans are likely to trade between $7.00 to $7.50 (+) until acreage and summer weather can be evaluated.

U.S. wheat production can rebound 200 mb next year and build U.S. stocks. More wheat is expected to be fed, with prices moving within 50 to 75 cents above corn. Source: USDA Reports and Informa Economics, Inc.
Biofuels and Crop Production in the Mid-Atlantic Region
Greg W. Roth, Professor of Agronomy
gwr@psu.edu
Department of Crop and Soil Sciences
Penn State University

The recent interest in biofuels could be one of the most significant developments in agriculture in a long time. We will likely see many impacts on how we do business. We have already seen a dramatic increase in crop prices and will likely see shifting uses in crops, different cropping systems evolve and lots of opportunities for those who understand the issues.

One issue is to understand the basis for the boom in biofuels. Biofuels, like grain and cellulosic ethanol and biodiesel, have fairly broad political support that was especially spurred by the spikes in gasoline prices this summer. But even before that, government policy was shifting to provide significant support to biofuel development at both the national and state level. The Energy Policy Act of 2005 passed by our federal government and much state recent legislation has provided a great boost to investment in this industry.

Biofuels are a new market for our grain crops and provide some basis for higher prices and in some situations can provide relief for high prices of imported oil. It’s also important to understand that the impetus for biofuels goes beyond grain prices or gas prices at the pump. Rural development due to biofuels is an important consideration and has had a major impact in some states like Iowa and South Dakota. Reducing our dependence on foreign oil is another issue. Another issue is reducing the flow of dollars to oil producing countries that may not be that stable or friendly. Still another issue is the global warming issue and the need to reduce carbon emissions to the atmosphere. None of these is a simple issue, and there is no silver bullet. Many are suggesting that only with a long term vision, that includes biofuels, other alternative fuels, and energy conservation, can we address this issue.

Many new issues will surface as a result of the biofuel issue. One is the competition between feed and food. An excellent backgrounder on the biofuel and ethanol issue was recently released by the Council for Ag Science and Technology (CAST). Its entitled “Convergence of Energy and Agriculture: Implications for Research and Policy” and is available here: http://www.cast-science.org/cast/src/cast_top.htm. It discusses the value of grain for energy versus feed, the economic opportunities of biofuels, the potential impact on the livestock industry and proposes some policy changes that are needed to move forward on this issue.

In our region, each potential biofuel crop has a different set of management issues and opportunities that agronomists should be aware of. I have summarized a few of these issues for several of our crops below.

Corn
Corn is a major crop in the region and can be used for ethanol production or for direct combustion in grain stoves or furnaces. Both of these areas have been experiencing rapid growth. Corn yields have been increasing in the U.S. by about 2% per year, causing surpluses and low prices. Corn is often undervalued based on its energy content. For example, a bushel of corn at $2.50/bushel could be converted into 2.7 gallons of ethanol valued at $2.50/gallon and 17 pounds of distillers grains. An average PA corn yield of 122 bushels per acre could produce 329 gallons of ethanol per acre. In addition the corn stover could be collected and used for cellulosic ethanol, or electricity, as some Penn State researchers recently showed (http://live.psu.edu/story/18683). As a home heating fuel, corn is worth about $7.00/bushel when propane is $2.00/gallon. Our Ag and Biological Engineering Department at Penn State has a good website that describes the relationship between fuel prices and the equivalent price of shelled corn as a home heating fuel: http://energy.cas.psu.edu/burncorn/shellcorn.html.

Barley
Barley is an alternative energy crop that is used as a substitute for corn. It requires less fertilizer and also grows over the winter, protecting the soil. In addition, many farmers can grow a crop of soybeans after they harvest the barley. Barely markets have been low as many feed companies prefer corn, so barley is often undervalued compared to corn. This has not stimulated barley production or research, but there is great potential for this crop to be a low cost alternative ethanol or home heating fuel crop. One special type of barley, called hulless barley, is being evaluated as an ethanol feedstock by researchers at Virginia Tech, the University of Maryland, Penn State and the University of Delaware. Hulless barley has a theoretical ethanol yield of about 2.4 gallons of ethanol/bushel, slightly lower than corn. In three on-farm demonstrations this year in Pennsylvania we were able to average 90 bushels of hulless barley (about 214 gallons of ethanol per acre) plus straw and then double crop the fields with soybeans.

Soybeans
Soybeans are a major Mid-Atlantic crop and are targeted as a key crop for biodiesel development. Soybean acreage has been increasing in Pennsylvania recently. Soybeans contain about 20-22% oil and 40% crude protein, so they contain much more protein than oil. The protein is used for animal feed. Oil yield per acre for a typical soybean yield of 41 bushels per acre is about 58 gallons. Historically, soybean processing has been limited in Pennsylvania, so most soybeans were sent to Ohio or Virginia for processing. Now, more interest has developed for processing soybeans in the region and for biodiesel production. One issue that is developing now is increasing demand for soy oil. Some new biodiesel plants are planning on the capability to use multiple feedstock to have the flexibility to deal with shortages of soybean oil.

Rapeseed/Canola
Rapeseed is another alternative oilseed crop that could be used for biodiesel production. Canola is a special type of rapeseed that produces food grade oils. These crops are primarily grow in the Dakotas and western Canadian provinces. They are also widely grown in Europe for the rapidly expanding biodiesel industry there. They can be grown here and will yield well but there are no existing
markets for the crop. Canola typically contains 40% oil and can produce oil yields of 129 gallons of biodiesel per acre from a production of 56 bushels per acre, so this crop has the potential of significantly increasing biodiesel production per acre compared to most other crops. Canola has some production issues like winterkill, disease, and shattering but improvements in varieties seem to have helped these issues. Both Penn State and Virginia Tech are involved in some evaluations of winter canola varieties with Kansas State University. At Penn State, we are also estimating the cost of production compared to other crops and formulating some recommendations for winter and spring production. We have seeded some winter canola and hope to make some biodiesel from it this summer.

**Switchgrass**

Switchgrass is a warm season perennial grass that has gained much popularity recently as a possible energy source for either cellulosic ethanol or in the near-term, as a feedstock for pellet stoves. Switchgrass requires relatively low inputs and can provide excellent winter wildlife cover. Dr. Paul Adler researchers at the USDA-ARS Pasture Systems Watershed and Management Unit on the Penn State campus have been evaluating switchgrass management for the past several years and recently published their findings in Agronomy Journal. One interesting finding of their study was that the ash content of switchgrass could be reduced by delaying the harvest until spring. Ash content of switchgrass is higher than some other feedstocks, so for use of the crop for pelletizing, it may be better to delay harvest. This could also reduce nutrient removal and provide good wildlife cover over the winter. Paul is also working with several groups to pelletize some switchgrass to evaluate as an alternative to wood pellets. Other researchers at Cornell are evaluating cool season grasses for pelletizing and have developed a comprehensive website that includes a pellet stove evaluation ([http://grassbioenergy.org/intro/intro.asp](http://grassbioenergy.org/intro/intro.asp)).

**What Is A Mediator?**

A mediator has been trained to work with individuals and organizations in identifying mutually acceptable solutions to shared problems. The mediator is not a judge, but is there to direct the mediation process and stimulate communication between the involved parties. Through the process, there is no finding of right or wrong and the mediator has no power to impose a solution. The mediator will work with the parties to develop mutually acceptable and feasible options.

An agricultural mediator has additional training related to the kinds of problems related to agricultural production. The process is based on fairness, integrity and the mediator's skill in helping agricultural producers, agencies, companies and Maryland citizens to arrive at their own solutions to their problems.

**Why Mediate?**

Mediation is an alternative process to taking a particular conflict to court and incurring burdensome legal expenses. Participants in the mediation process create their own solution. The mediator does not arbitrate the settlement. Flexibility in considering a full range of realistic options is encouraged in the solution process. The fact that disputing parties are meeting together in the same room for the purpose of working out a solution to the particular problem(s) enables everyone to deal openly and knowledgeably with the full array of issues. All steps are taken to ensure confidentiality.

**Steps in Agricultural Mediation**

1. An agricultural producer or an organization or individual with a dispute concerning agricultural production may request mediation by contacting the Maryland Agricultural Mediation Project (FARM SENSE) and completing the form entitled "Request for Voluntary Mediation."

2. FARM SENSE staff will confirm that the other party (or parties) is willing to participate in mediation. A brief description of the situation is gathered by the Mediation Coordinator to prepare a briefing report for the mediator.

3. A mediator is assigned by the Program Director.

4. All the parties are notified as to the date, time and neutral location of the mediation session.

5. Most mediation sessions will be concluded in two to three hours unless everyone agrees that more time is needed.
MARYLAND COOPERATIVE EXTENSION OFFERS STATEWIDE GRAIN-MARKETING WORKSHOPS
“Winning the Game” Series Simulates Real-Life Marketing Decisions
Bob Tjaden, AGNR Program Leader, University of MD

This marks the third year in which the University of Maryland Cooperative Extension has offered “Winning the Game” grain marketing workshops. More than 211 producers participated in Winning the Game sessions last year. Many left the session proclaiming it was the best marketing workshop they have ever attended.

Developed by the University of Minnesota Center for Farm Financial Management, these workshops simulate real-life grain marketing decisions, enabling farmers to practice marketing without the risk of losing actual money. During the workshops, participants put their marketing skills to work, making grain marketing decisions based on actual market information.

In “Winning the Game: Launch Your Pre-harvest Marketing Plan,” participants review an actual marketing plan, exploring how target dates and target prices can help producers more consistently secure a good average price for their crop. Through the game in this workshop, farmers get a feel for how a marketing plan can work and react to real-life market fluctuations.

Workshops: Pre-Harvest

January 23 – Cecilton Firehouse, Contact David Almquist 410-996-5280
January 25 – Ruthsburg Community Center, Contact John Hall 410-778-1661
January 25 – Mt Airy, Contact Doug Tregoning 301-590-2809
January 29 – Easton Firehouse, Contact Shannon Dill 410-822-1244
January 30 – Hughesville, Contact Ben Beale 301-475-4484
January 31 – Upperco, Friendly Farms, Contact Dave Martin 410-666-1022
February 8 – Lower Eastern Shore, Contact Eddie Johnson 410-749-6141

Times: 9:00am – 3:00pm all locations

Workshops are open to all and if special assistance is required please notify the contact five days prior to the meeting.

The cost of the workshops is $10 which includes refreshments and materials. **Pre registration is required five days prior to the scheduled meeting.** This program is sponsored by Maryland Soybean Board, Maryland Grain Producers Utilization Board, Mid-Atlantic Farm Credit, Colonial Farm Credit, United States Department of Agriculture, NorthEast Center for Risk Management, Local Sponsors.

Farmers’ Market Survey

This survey will be used to identify agricultural operations seeking business opportunities in Anne Arundel County.

| Business Name: | ________________________________ |
| Contact: | ________________________________ |
| Phone: | ________________________________ |
| Fax: | ________________________________ |
| Email: | ________________________________ |
| Web Site: | ________________________________ |
| Address: | ________________________________________________ |
| County: | ________________________________ |
| Farm Business Description: | ________________________________________________ |
| Are you interested in the following opportunities in Anne Arundel County (please check any of those you would be interested in): | Farmers’ Market _____ Twilight Market _____ CSA _____ Organic Market _____ Special Event Market (Mothers’ Day, festivals, parades) _____ Agritourism _____ Wineries _____ Beef _____ Poultry _____ Eggs _____ Other: | | What products would you sell at a farmers’ market | | | | Please return the completed survey to: | Anne Arundel Economic Development Corporation | ATTN: Lisa Barge | 2660 Riva Road, Suite 200 | Annapolis, MD 21401 | The Anne Arundel Economic Development Corporation (AAEDC) manages and promotes agricultural and environmental programs on behalf of Anne Arundel County. These programs are part of the AAEDC mission to serve business needs and to increase the county’s economic base through job growth and investment. These programs also enhance the unsurpassed quality of life we have in Anne Arundel County. For additional information, please contact Ms. Lisa Barge, Agricultural Marketing & Development Manager at AAEDC 410/222-7410 or via email lbarge@aaedc.org |
Nutrient Management Update
Krista Mitchell Nutrient Management Advisor for
University of Maryland

Happy New Year! With all of this warm weather, spring may come early this year, so take advantage of the unfrozen ground and get your soil samples taken for your 2007 Nutrient Management Plans. You are welcome to stop by our office any time to borrow one of our soil sampling probes. Our office is open Monday through Friday from 8:00 a.m. to 4:30 p.m. Our website contains price comparison information for the labs that may be used for nutrient management planning purposes:
http://extension.umd.edu/local/AnneArundel/files/Soil_Lab_Comp.pdf

Many of you have already received an Annual Implementation Reporting Form from the MD Department of Agriculture (MDA). This annual form merely demonstrates to MDA that producers are implementing their Nutrient Management Plans (NMP’s). If you’ve kept your NMP’s updated, kept field-by-field crop yield records and nutrient application records for commercial fertilizer, manure and/or biosolids, as is required in accordance with the nutrient management regulations, the form should be fairly painless to fill out.

Your cover letter within your NMP will assist you with your consultant’s name, certificate and license numbers, information on manure generation, and your NMP’s start date (the date the NMP was written) and end date (NMP’s are usually written for 1-3 growing seasons). The property tax identification numbers are also listed in your cover letter, but one only needs to fill out the “Account ID” section of the Reporting form if a property/parcel has been added or deleted from the agricultural operation in the calendar year of 2006.

Most importantly, make note that when you sign the Reporting Form, there is a statement above your signature that says, ‘A valid NMP will be followed during the current and upcoming cropping year’. Call Krista Mitchell in Anne Arundel County or Chris Dowell in P.G. County for assistance with your plan updates. If anyone has any questions about the Reporting Form, please call MDA at (410) 841-5959 for assistance. Remember, all producers that make greater than $2,500 Gross Annual Income and/or those operations that have 8 or more animal units (1 animal unit = 1,000 lbs. live weight) are required to have a current Nutrient Management Plan for their operation.

Note: Aerial maps with soil survey overlays are available online at:

Check Out Our Updated County Website
Visit us in Cyberspace!!

Christie Germuth is our website designer. Christie has recently updated our website, and we hope that you find the additions helpful. The current and past newsletter additions are available for viewing or copy at:
http://extension.umd.edu/local/AnneArundel/files/agnews.cfm
An agricultural bulletin page is also available for viewing or copy under our hot topics section at:
http://extension.umd.edu/local/AnneArundel/files/agbulletins.cfm

Thanks for Partnering
Thanks for partnering with the Maryland Cooperative Extension, and supporting our programs. I also hope you enjoy this newsletter. If you are no longer interested in receiving this newsletter, please call or write the office for the removal of your name from the mailer.

Behold, Lovers of Agriculture!

R. David Myers
Extension Educator
Agriculture and Natural Resources
Anne Arundel & Prince George’s Counties
Fruits and Vegetables

NACAA Communication Award
Individual Newsletter
2002 National Winner

Prince George’s Cooperative Extension
6707 Groveton Drive
Clinton, MD 20735
301 868-8783

Anne Arundel Cooperative Extension
7320 Ritchie Highway, Suite 210
Glen Burnie, MD 21061
410 222-6759 or 301 970-8250

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“A government big enough to give you everything you want is a government big enough to take from you everything you have.”

Gerald Rudolph Ford, Jr.
Orchard Multi Fruit

Cover Spray Program

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

(Labeled as noted in 2007 for All Tree Fruit - Apples, Peaches, Pears, Plums, Nectarines, and Cherries.)

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</table>

**INSECTICIDES:**

<table>
<thead>
<tr>
<th>Product</th>
<th>Rate</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guthion® 50W</td>
<td>16.0 ozs</td>
<td>Codling &amp; Fruit Moth</td>
</tr>
<tr>
<td>Imidan® 70W</td>
<td>2.0 lbs</td>
<td>Plum Curculio</td>
</tr>
<tr>
<td>Lannate® 90SP</td>
<td>12.0 ozs</td>
<td>Codling &amp; Fruit Moth</td>
</tr>
<tr>
<td>Lorsban® 4E</td>
<td>1.5 qts</td>
<td>Dormant Only</td>
</tr>
<tr>
<td>(Not for Cherries)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endosulfan® 50WSB</td>
<td>3.0 lbs</td>
<td>Misses Plum Curculio</td>
</tr>
<tr>
<td>Vendex® 50W</td>
<td>1.0 lbs</td>
<td>Mites Only</td>
</tr>
<tr>
<td>Sevin® 50W</td>
<td>4.0 lbs</td>
<td>Japanese Beetles</td>
</tr>
<tr>
<td>(Apple Thinning Agent)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Be rate for 50-100gal Acre Concentrate Spray**

**Important Note:** All labels closely follow PHI and REI!

Multi-Fruit Spray Calendar*

**May 5 -- 1st Cover Spray**

- Captan® 50W 2.0 lbs
- Nova® 40W 4.0 ozs
- Imidan® 70W 2.0 lbs (Plum Curculio)

**May 15 -- 2nd Cover Spray**

- Captan® 50W 2.0 lbs
- Toppin-M® 70W 12.0 ozs
- Guthion® 50W 16.0 ozs (Plum Curculio)

**June 1 -- 3rd Cover Spray**

- Captan® 50W 2.0 lbs
- Nova® 40W 4.0 ozs (7-Day Peach PHI)
- Endosulfan® 50WSB 3.0 lbs (Codling & Fruit Moths)
- Vendex® 50W 1.0 lbs (For Mites if Required – 14-day PHI All Fruit)

**June 15 -- 4th Cover Spray**

- Captan® 50W 2.0 lbs
- Toppin-M® 70W 12.0 ozs (1-Day PHI All Fruit)
- Lannate® 90SP 12.0 ozs (Codling & Fruit Moths – 4-Day Peach PHI))

**July 1 -- 5th Cover Spray**

- Early Peach Harvest
- Sulfur 95W 3.0 lbs (0-Day PHI)
- Toppin-M® 70W 12.0 ozs (1-Day PHI All Fruit)
- Lannate® 90SP 12.0 ozs (Codling & Fruit Moths – 4-Day Peach PHI)

**July 15 -- 6th Cover Spray**

- Peach Harvests
- Captan® 50W 2.0 lbs (0-Day PHI but a 4-Day REI)
- Toppin-M® 70W 12.0 ozs (1-Day PHI All Fruit)
- Sevin® 50W 4.0 lbs (Japanese Beetle & Moths – 3-Day PHI for All Fruit)

**August 1 -- 7th Cover Spray**

- Peach Harvests
- Sulfur 95W 3.0 lbs (0-Day PHI)
- Toppin-M® 70W 12.0 ozs (1-Day PHI All Fruit)
- Sevin® 50W 4.0 lbs (Japanese Beetle & Moths – 3-Day PHI for All Fruit)

**August 15 -- 8th Cover Spray**

- Early Apple Harvests
- Late Peach Harvest
- Captan® 50W 2.0 lbs (0-Day PHI but a 4-Day REI)
- Toppin-M® 70W 12.0 ozs (1-Day PHI for All Fruit)

**September 1 -- 9th Cover Spray**

- Apples and Pears Only
- Captan® 50W 2.0 lbs (0-Day PHI but a 4-Day REI)
- Sulfur 95W 3.0 lbs (0-Day PHI)

**September 15 -- Trunk Bore Spray**

- Lorsban® 4E 1.5 qts (For Bores)

**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 orchard.

R. David Myers
Extension Educator, Agriculture
2007