Time to Begin Apple Tree Pruning and Training

Win Cowgill, Agricultural Agent

The warm weather we had through December prevented the trees from going fully dormant. I believe we have had adequate cold temperatures to begin pruning. Always start with your oldest apple trees first, followed by oldest pears and then oldest peaches and young trees last but in the same order.

Pruning and training apples is both an art and a science. This old adage is even truer in today’s modern high density orchard planting systems. Orchard productivity and development are direct functions of sunlight. Light management through proper pruning is the key to high annual yields of high quality fruit. Annual pruning is a necessary practice that maintains the profitability of an orchard. Knowing not only what must be cut out but also what should be left in and how the tree will respond is the science behind pruning. The productivity of an orchard can be affected for the next three years by cuts made this season! It is critical for growers to know what will result from management decisions made now, and understand what technique will maximize profits in the long run.

The objective of tree training and pruning is to maximize sunlight interception of the tree. This allows for light distribution within the tree canopy to maximize fruit quality for this season and fruit bud initiation for next season’s crop. Proper light interception and distribution are essential for growing high quality fruit. Correct pruning and tree manipulation techniques must be done at minimum on an annual basis in the dormant season followed by a tune up in the summer. Growers should also keep in mind other important factors that justify the need for pruning, such as the maintenance of tree height, structure, and appropriate balance between vegetative growth and fruit, which allows for annual cropping of high quality fruit with better color. Penetration of spray materials and natural reduction of pest pressure, especially diseases, are other factors that are directly affected by pruning.

In our higher density planting systems like slender spindle and super slender spindle where we have planting densities of 1000-2000 trees per acre, there is a much greater need for detailed pruning and management of the trees. But for the sake of time we will just discuss important general rules of pruning as they apply to all orchard densities.

See Pruning and Training on page 2
**Pruning and Training from page 1**

For basic pruning rules for apple, see accompanying article on page 3.

There are two types of pruning cuts made, heading and renewal cuts.

A heading cut is when a cut is made into a branch or the leader, cutting back to a weaker shoot along that branch or leader. Heading cuts stimulate excessive growth at the site of the cut, and will stiffen the wood that has been headed. Juvenile (1 year old) wood will respond much more prolifically to such a cut as opposed to mature wood. Heading cuts should be avoided unless the intent is to cause one of these two responses to occur. Unnecessary heading cuts into an established limb or scaffolds juvenile wood will cause an excessive amount of flush growth, that will shade out the tree and be counterproductive to good tree management techniques. If tree growth suppression and the maintenance of a compact tree are the only desired effects from a heading cut, always cut an established limb or scaffold back into a mature, bearing side shoot or limb. When making a heading cut never cut a limb back to blind wood (deadhead). The result will be tip dieback and wood rot will occur.

Renewal cuts, on the other hand, are cuts made at the point of branch origin. Most renewal cuts are intended to remove a branch that is no longer desirable because of vigor concerns or excessive crowding. Renewal cuts on established trees are always into mature wood and will not spark the vegetative regrowth that a heading cut will.

**Central Leader**

The central leader is the tree’s natural regulator. Tree performance and structure depends heavily on the manipulation of the leader. Cutting into the central leader can cause a loss of control with that tree or delay cropping on non-bearing trees. Heading cuts on a central leader should be done at planting when conditions warrant its use, (except on Slender Spindle trees where no cuts are made) and should be the last option used to induce branching on established trees. If more branching is desired, other techniques such as notching, bending and the use of plant growth regulators may provide a better alternative for inducing branching on the leader. Never cut into the central leader without knowing what responses the tree will express.

**Spur pruning** is a good way to rejuvenate trees that are heavy spur bearers such as Red Delicious, Empire and Gala. A tree will produce its highest quality fruit on spur that are 2-5 years old. Any spur that is older than 5 yrs yields reduced quality fruit and should be removed. Some spur pruning should be done every year on trees older than five years. The age of a spur can be determined by its size. Spurs on the bottom of limbs should be removed, as they will never produce high quality fruit.

Although proper pruning can be an overall dwarfing process, it is locally invigorating, stimulating vegetative growth at the site of the cut. On a non-bearing tree, this type of stimuli causes the tree to remain in the vegetative mode, which delays cropping. For this reason, pruning young non-bearing trees should be avoided unless correcting major structural defects. Tree training and minimal corrective pruning of tree structure in the non-bearing years are critical to the overall performance of an orchard throughout its life.

**Branch manipulation (training)** plays the major role on tree structure and precocity (how quickly the orchard bears a crop) in the non-bearing years of an orchard. Only minor pruning should be done until after the tree crops for the first time. Once the tree has produced a crop, then it is time to begin an annual dormant pruning regimen. Since we have not done much pruning up to this point, the tree may need a lot of attention (depending on variety), at this time. However an excessive amount of pruning at any single time will cause an overstimulation of vegetative growth and a loss of balance within the tree between fruiting and vegetative growth. Excessive pruning can also cause sunburn to the fruit and wood of sensitive varieties such as Gala, Fuji and Golden Delicious.

The proper balance between fruit and vegetative growth is another important relationship. An imbalance between the two can result in inferior quality fruit and biannual bearing. No two systems or cultivars will respond in the same manner to the above presented techniques, but understanding these procedures, and the response they induce will help reduce the gamble of making an improper decision. Growers need to be conscious of details that relate specifically to their cultural systems, and proper ways of managing them.

There are many more techniques and tree responses that need to be understood when managing an orchard. Each orchard system provides new and unique techniques to the growing process. Sometimes, less is more, and understanding what can be manipulated is just as important as knowing what needs to be removed. An orchard’s optimal performance will never be achieved if this relationship is not understood and maintained.

**Resources**

All about the tall-spindle apple  
[http://www.umass.edu/fruitadvisor/clements/tallspindle-apple](http://www.umass.edu/fruitadvisor/clements/tallspindle-apple)

“Training and Pruning Apple and Pear Trees” by Forshey, Elving and Stebbins. This is an excellent reference on apple pruning is in. It is a 166 page paperback obtainable from the American Society for Horticultural Science. It contains a lot of theory on the whys of apple growth and pruning, in addition to giving sound advice.  

*See Pruning Resources on page 3*
A Few Basic Rules for Apple Pruning

Win Cowgill, Agricultural Agent and Jon Clements, Extension Educator, UMASS

The objective of apple tree training and pruning is to maximize sunlight interception of the tree. This is extremely important on higher density apple trees planted on dwarfing rootstocks. We developed the following set of rules to simplify the process. These rules work on any central leader tree, tall spindle, French Ax, slender spindle system of apple training.

These rules are easy to teach laborers and experienced help as well. We are now in the fifth season of utilizing this system of pruning and training. It dramatically changes the appearance of orchards; even older trees that have grown top heavy.

We have translated these into Spanish and have trained two crews in North Jersey on how to implement them. If you would like an on-farm consult let us know. We also have these rules printed on card stock in English and Spanish that will fit in your pocket for easy reference.

Seven Rules for Pruning Apples (Complete in order from 1-7)

1) Remove 2 or 3 of largest limbs in the top two-thirds of the tree
2) Use the 2-to-1 rule (called diameter-based pruning). Remove any scaffold branch or limb that is half the diameter or larger than the central leader. A branch of this size chokes out the leader, not allowing the tree to reach optimal fruiting capacity. Use bevel cuts to remove these limbs.
3) Avoid heading cuts – remove the entire limb instead.
4) Avoid complex branches in the lower one third of the tree. As branches on lateral limbs get older they develop additional branches. This is what we call a complex branch. Leave the smaller pencil thick fruiting shoots.
5) Remove downward hanging branches.
6) Remove shoots that are growing straight up.
7) Leave one shoot as a central leader – do not prune it.

Note: Win Cowgill can be reached by e-mail at: cowgill@njaes.rutgers.edu.

A hard copy pocket guide on the seven rules of pruning in both Spanish and English is available. Contact Diana Boesch at boesch@aesop.rutgers.edu or 908-788-1339 - cost is $1.00.

Seven Apple Pruning Rules, UMASS-Rutgers Fact Sheet
www.umass.edu/fruitadvisor/factsheets/pruningtips.pdf

Seven Apple Pruning Rules, UMASS-Rutgers Video
http://www.umass.edu/fruitadvisor/clements/video/rss/umextfsvodcast.xml
“Positioning Your Farm Business for the Future”
Keynote Address at Mid Atlantic Fruit and Vegetable Convention

The first decade of the new century is in the books. There has been an economic surprise around every corner that has created some unprecedented challenges but also some business opportunities. Understanding what makes a good business great is critical. Let’s examine the economic crystal ball both around the corner and down the road concerning domestic and global economics using the dashboard economic indicator benchmarks assessment.

David Kohl, Ph.D., President of AgriVisions, LLC will discuss land values, oil prices, and interest rates that are imperative in sound strategic business planning. Time-tested business principles will be presented that work regardless of the business cycle or changing paradigms.

David Kohl received his M.S. and Ph.D. degrees in Agricultural Economics from Cornell University. For 25 years, Kohl was Professor of Agricultural Finance and Small Business Management and Entrepreneurship in the Department of Agricultural and Applied Economics at Virginia Tech, Blacksburg, Virginia. He was on special leave with the Royal Bank of Canada working on advanced initiatives for two years, and also assisted in the launch of the successful entrepreneurship program at Cornell University. Kohl is Professor Emeritus in the AAEC Department at Virginia Tech.

Kohl has traveled over 8 million miles throughout his professional career! He has conducted more than 6,000 workshops and seminars for agricultural groups such as bankers, Farm Credit, FSA, and regulators, as well as producer and agribusiness groups. He has published four books and over 1,100 articles on financial and business-related topics in journals, extension, and other popular publications. Kohl regularly writes for Ag Lender and Corn and Soybean Digest.

He has received 11 major teaching awards while teaching over 10,000 students, and 17 major Extension and Public Service awards from Virginia Tech, Cornell University, and state and national organizations. Kohl is a two-time recipient of the prestigious American Agricultural Economics Association’s Outstanding Teaching Award. Kohl is only one of five professors in the nearly 100-year history of the Association to receive the award twice. He received the Governor’s award for his distinguished service to Virginia agriculture, the youngest recipient to receive this award.

Kohl has addressed the American Bankers Agricultural Conference for over 30 consecutive years, and has appeared before numerous state bankers’ schools and conferences throughout the U.S., Canada, Mexico, and the world. He has also been one of the top rated instructors at the LSU and Colorado Graduate Schools of Banking, and is Chancellor of Farm Credit University, which has trained over 700 lenders using an online and face-to-face educational approach.

As facilitator of the United States Farm Financial Standards Task Force and member of the Canadian Agricultural Financial Standards Task Force, Dr. Kohl was one of the leaders in establishing guidelines for the standardized reporting and analysis of agricultural producers’ financial information on a national and international basis. The Kohl Agribusiness Centre has been established in the College of Agriculture and Life Sciences at Virginia Tech in honor of his long-term commitment to practical teaching, research, and extension.

Kohl is currently President of AgriVisions, LLC, a knowledge-based consulting business providing cutting-edge programs to leading agricultural organizations worldwide. He is also business coach and part owner of Homestead Creamery, a value added dairy business in the Blue Ridge Mountains.

Please register for the Mid Atlantic Fruit and Vegetable Convention and Trade Show by going to registration forms on the web site: http://www.mafvc.org/html or contact Jerry Frecon at frecon@njaes.rutgers.edu.

WINEGRAPE MEETINGS FROM PAGE 6
has shown it works!); Economic sustainability in variety choices (Stephen Rigby and Ed Boyce are two top notch wine growers in the region); Bird netting and control options (who didn’t have problems last year); there is a wide selection of wine making and marketing sessions as well.

Beginner Grape Grower Workshop at EWE in Lancaster (March 9): Penn State and University of Maryland extensions have teamed with EWE to host a new grape grower workshop for people new to the vineyard business or who want to learn more about what it takes to start a commercial wine vineyard in the Eastern US. Instructors are Dr. Joe Fiola and Mark Chien. Workshop topics include: overview of the regional wine industry, grape marketing, vineyard economics, vineyard site selection, vineyard equipment-supplies and materials, grape varieties-clones-rootstocks, vineyard design and site preparation, vineyard establishment, trellis construction, plant materials and planting, early vine training and care, diseases in new vineyards, insect-pest-weed management in new vineyards. This is a ton of material packed into a very long day but it is a good overview of what it takes to start a vineyard. If you survive until the end, you can probably do it. Other beginner workshops are offered around the region.

Submitted by Jerome L. Frecon from electronic newsletter.
Spanish Speaking Horticultural Session
Jerome L. Frecon, Agricultural Agent

Each year a session for Spanish-Speaking farmer and their employees is held at the Mid-Atlantic fruit and Vegetable Convention and Trade Show in Hershey, PA. This year the session will be held on Wednesday, February 1, 2012 at the Hershey Lodge and Convention Center in Hershey.

The same registration procedure will be followed as for all other sessions. Use the New Jersey State Horticultural Society registration form on the website at www.mafvc.org/html and go to the registration program. If you have any questions contact Jerome Frecon at Frecon@njaes.rutger.edu.

Special Session for Spanish-Speaking Employees at the Mid-Atlantic Fruit and Vegetable Convention
Técnicas de Producción de Frutas y Hortalizas
Wednesday, February 1, 2012
Hershey Lodge and Convention Center
Hershey, PA

**9:45 Mantener registros precisos de pesticidas**
(Keeping Accurate Pesticide Records)

10:45 Entendiendo la poda de árboles frutales: Vertical axe y tall spindle
(Understanding Pruning of Fruit Trees: Vertical Axe and Tall Spindle)

1:30 Discusión: Apoyo a la agricultura sostenible y agricultores rurales en América Latina
(Discussion: Supporting sustainable agriculture and rural farmers in Latin America)

2:00 Interacciones ecológicas entre patógenos, insectos, y plantas en los cultivos de cucurbits
(Ecological Interactions Between Pathogens, Insects, and Plants in Cucurbit Fields)

*2:30 Manejo de suelos sostenible
(Sustainable Soil Management)

3:00 Entendiendo el ciclo de vida de un árbol frutal
(Understanding the Life Cycle of a Fruit Tree)

*Category credit
**Core Credit
(Credits offered pending approval from PA Dept. of Agriculture).

Calendar of Events

January 17-18, 2012 - Vegetable Growers Association of New Jersey Convention, Trump Taj Mahal, Atlantic City, NJ. For more info contact Rocco DiGerolamo, Jr. at 857-797-1686 or visit: www.njveggies.org.

January 18-19, 2012 - New Jersey Ag Convention, Trump Taj Mahal, Atlantic City, NJ. For more information contact the New Jersey Ag Association 609-292-8896.


January 31-February 2, 2012 - Mid-Atlantic Fruit and Vegetable Convention, Hersey, PA. For more info contact William Troxell at 717-694-3596, by email: pvga@pvga.org or visit: www.mafvc.org.

March 7, 2012 all day - North Jersey Fruit Meeting, Warren Grange #10, 102 Asbury Broadway Road County Route 643, Asbury, NJ 08802 (Warren County). Contact Win Cowgill, coordinator at cowgill@aesop.rutgers.edu.

Wine Grape Information for the Region
Mark Chien, Viticulture Educator, Penn State Cooperative Extension

Time to Learn: Upcoming Viticulture and Enology Events Around the Region

The 2012 viticulture and enology events calendar has filled out and includes many learning opportunities across the region – Pennsylvania, Maryland, Virginia, New Jersey, New York, Ohio, North Carolina and beyond! Please view the calendar on the events page of the Pennsylvania Wine Grape Network website at http://www.pawinegrape.com/index.php?page=events and attend the meetings that best suit your educational needs. Listings include program, contact and registration information and, when applicable, a website to the event. The following are meetings being held in Pennsylvania.

**Pruning workshops** (Pennsylvania 1/21 and 2/8): there is a right and wrong way to prune and the health, productivity, quality and sustainability of your vineyard will depend on it being properly and carefully pruned. This is not something you can learn how to do by reading a book. These workshops explain the principles, terminology, and methods of pruning in commercial wine vineyards. There are workshops available in Pennsylvania, Maryland and Virginia.

**Pennsylvania benchmark wines in Harrisburg** (January 15): I have always advocated the benefits of tasting international, domestic and local benchmark wines. If you don’t know what the other guy is doing, how can you fix the position of your quality? For the past 10 years the Pennsylvania Wine Society has made it its business to try to find the best Pennsylvania wines. This is not a professional society but a group of wine lovers who were open to the idea of Pennsylvania dry wines before many of us even thought about it. Dr. Gary Pavlis from Rutgers helps to run the competition and the wines they select are always impressive. This is a great opportunity to get a close up view of the wine quality landscape in Pennsylvania.

**PWQI Sensory Workshop in State College** (January 30 and 31): There is a technical aspect of wine production that every commercial wine maker must know. There are bad aromas and flavors that mark wines as non- or borderline commercial quality. Winemakers must be familiar with these characteristics in their wines just as grape growers must be able to ID diseases and insect pests in the vineyard. Stephen Menke started this sensory education workshop and Mario Mazza has carried it forth until the arrival of Denise Gardner, our extension enologist. Now, with her training and experience in the sensory evaluation of wines, this workshop will be better than ever, and, in fact, should be considered essential for every commercial winemaker. Denise will offer the 2-day workshop with Mario, John Hayes (Penn State sensory food scientist) and Ryan Elias (Penn State food chemist).

**Wine Grapes at the Mid Atlantic Fruit and Vegetable Convention and Trade Show** (February 1): It’s not just about chocolate - the wine grape section of the Mid-Atlantic Fruit and Vegetable Convention in Hershey is packed full of relevant and timely topics this year: Grape disease research update – bunch rot, black rot and phomopsis (B. Hed); Soil health and nutrition and the Cornell soil health program (L. Stivers); Bird management in vineyards (M. Chien); Powdery mildew and downy mildew research in a trying year (N. Halbrendt); PSU wine variety trail update (R. Crassweller); Wine observations from the 2011 vintage (D. Gardner); The New Zealand wine industry and relations to the US (K. Kelley); National clean plant network for wine grapes (I Tzanetakis); Impact of the use of phosphorus acid fungicides (J. Fiola). There is a very large trade show at the convention. For registration information go to http://www.mafvc.org/html/ and register with New Jersey or contact Jerry Frecon at frecon@njaes.rutgers.edu

**The Pennsylvania Winery Association** moves its annual meeting forward (March 6) to accommodate the new Eastern Winery Exposition in Lancaster. PWA is the public face of our collective wine industry and it is well worth supporting. We are still an emerging wine industry with many political and economic issues facing us. PWA is mostly about marketing wines and everyone who sells Pennsylvania wines benefits from their efforts. If you are growing grapes or making wine in Pennsylvania, you should be committed to support PWA and you can do so by attending the annual meeting!!

**Eastern Winery Exposition: A New Winery and Vineyard Convention in Pennsylvania** (March 6-8): Remember when Wineries Unlimited was in Lancaster (5 minutes from my house)? Then it moved to King of Prussia, and then to Richmond. The Eastern Winery Exposition seeks to fill the regional void left by WU, and is hosting its first convention at the Marriott Hotel and Convention Center in Lancaster. Most of you know the drill. There are viticulture and enology educational sessions and a vineyard and winery equipment and supplies trade show. Some of my favorite scheduled viticulture sessions include: Growing Cabernet Franc for fine wines (Adam McTaggart, the talented winemaker from Boxwood Vineyards in Virginia); Benefits and mechanics of close spacing and cane pruning (Lucie Morton)

See Winegrape Meetings on page 4
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