

UK COOPERATIVE EXTENSION SERVICE
University of Kentucky – College of Agriculture

IPM Calendar for Deciduous Tree Production



Managing Pests for Quality Trees & Environmental Stewardship



2007-08 Calendar for Deciduous Tree Production

Before Planting

Site Selection - Put the “Right Plant in the Right Place”. Do not plant trees requiring excellent drainage (dogwood, cherry, zelkova) in a slowly draining field. Likewise, make sure a plant that needs full sun to thrive is not shaded by trees in the field margins. Do not plant verticillium wilt-susceptible species (maple, tuliptree, smoketree, elm) in a field after strawberries, vegetables or after ornamentals that have been diagnosed with verticillium wilt.

Liner Quality/Pest Inspection - Inspect all plants for healthy, fibrous root systems; straight, undamaged trunks; strong, intact grafts and branches; diseases; insect damage or presence; and weeds. Moisten roots immediately. Also check for plants that have broken dormancy and plan to plant them as soon as possible. Confirm the shipment includes the quantity and correct species and cultivar ordered. Photograph damage and send images to the liner nursery immediately. See Appendix 1.





Liner Storage and Handling - Keep storage conditions at 34-38°F and 85-100% humidity. Do not allow bareroot liners to freeze. Clean storage area with a bleach solution prior to arrival of plants. Do not allow liners to sit in puddled water while in storage. Spray with a fungicide to prevent damage while in storage. Have a foot bath at each entrance to eliminate contamination of the storage area. Soak roots before planting. Keep roots moist while planting. Sweating may be required for optimal budbreak on some species.









Note: Trade names are used to simplify the information presented. No endorsement by the Kentucky Cooperative Extension Service is intended, nor is criticism implied of similar products that are not named.

User is responsible for following pesticide label instructions.

Dormant Season






LEGEND





- R** Try resistant varieties
-  Pruning and sanitation help control this pest
-  Scout before spraying; pest occurrence varies
-  Use traps or phenology to monitor when to spray
-  Monitor weather to predict the need to spray

Before Growth Starts		
Host Plant	Insect	Disease
Ash, Ornamental Fruit Trees, Hawthorn, Linden, Maple, Oak, Sweet Gum, Tuliptree, others	Mites, Scales Spray Omni Supreme Spray oil.	
Plum, Cherry		 Black Knot Prune out (or rogue) infected plants 3-4" below visible swelling.
Cherries, Crabapples	R  Eastern Tent Caterpillar Prune out egg masses.	
Many Species		 R  Crown Gall Scout for symptoms. Remove infected plants. Dip into <i>Agrobacterium</i> K84 at planting.
Rosaceae		R  Fireblight Prune out any cankered or diseased branches 4" below sign of infection and destroy. Remove infected plants in field margins.
Honeylocust	 Honeylocust Spider Mite Scout for adults in bud scales.	
Hemlock	 Hemlock Woolly Adelgid Scout for white, wooly masses at the base of hemlock needles.	
Crabapple, Hawthorn, Serviceberry		R  Rust Remove infected Junipers within a few hundred feet of the field.

March

LEGEND





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March		
Host Plant	Insect	Disease
All Species		 Canker Diseases Scout for symptoms. Remove infected plants or prune out cankers.
Various Species	 Granulate Ambrosia Beetle Trap, spray Perm-UP 3.2 EC or OnyxPro® at first sign of flight.	
Early April		
Host Plant	Insect	Disease
Plum, Cherry		 Black Knot Spray Daconil Weather Stik® after bud break once rainy periods with temperatures above 55 F are expected. Applications continue while shoots are elongating until 2-3 weeks after bloom.
Crabapple		 R Scab Spray at pink bud and petal fall plus 2 more times at 10 day intervals to reduce primary inoculum. Banner MAXX®, Daconil Weather Stik®, Eagle® 20EW, Fore™ 80 WP Rainshield™. <i>Do not grow scab susceptible crabapples in the nursery.</i>

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April

LEGEND





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Early April		
Host Plant	Insect	Disease
Rosaceae		 R Fireblight Spray when 25% and again when 75% of blooms are open with streptomycin sulfate. Use the MARYBLYT or Cougar Blight program to predict the need to spray.
Flowering Fruit Trees	 R Eastern Tent Caterpillar Spray <i>Bacillus thuringiensis</i> (BT), Omni Supreme Spray oil, Carbaryl 4L.	
Maple	 R Maple Shoot Borer Spray bifenthrin at or before 2 nd pair of leaves are dime-sized.	
Crabapple Hawthorn, Serviceberry		 R Rust Spray Banner MAXX®, Daconil Weather Stik®, Eagle® 20EW, Fore™ 80 WP Rainshield™, Strike® 50WDG as new growth appears and flower buds open. Repeat 3-4 times at 7-14 day intervals.
Many Species	  Oystershell Scale Spray at crawler hatch and again in 2-3 weeks with Talus® or drench with Safari™ 20SC when crawlers settle.	

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April

LEGEND





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Mid April		
Host Plant	Insect	Disease
Ornamental Fruit Trees	 Aphids Scout/spray Endeavor®, Omni Supreme Spray oil, Safari™ 20SC, TriStar® 30 SG when 50 aphids present on 7/10 shoots.	
Magnolia, Tuliptree	 Yellow Poplar Weevil Apply Carbaryl 4L, Orthene® Turf, Tree, and Ornamental Spray 97, when 10% of branches damaged.	
Plum, Cherry		 Black Knot Spray Daconil Weather Stik® after bud break once rainy periods with temperatures above 55 F are expected. Applications continue while shoots are elongating until 2-3 weeks after bloom.
Crabapple		 R Scab Spray at pink bud and petal fall plus 2 more times at 10 day intervals to reduce primary inoculum. Banner MAXX®, 3336®F, Daconil Weather Stik®, Eagle® 20EW, Fore™ 80 WP Rainshield™. <i>Do not grow Scab susceptible crabapples in nursery.</i>

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April

LEGEND





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-  Scout before spraying; pest occurrence varies
-  Use traps or phenology to monitor when to spray
-  Monitor weather to predict the need to spray






Mid April		
Host Plant	Insect	Disease
Rosaceae (if still in bloom)		 R Fireblight Spray when 25% and again when 75% of blooms are open with streptomycin sulfate. Use the MARYBLYT or Cougar Blight program to predict the need to spray.
Crabapple, Hawthorn, Serviceberry		 R Rust Spray Banner MAXX®, Daconil Weather Stik®, Eagle® 20EW, Fore™ 80 WP Rainshield™, Strike® 50WDG as new growth appears and flower buds open. Repeat 3-4 times at 7-14 day intervals.
Crabapple, Elm, Dogwood, Maple, Honeylocust, Zelkova, others	 R Calico Scale <i>Recommendation in development:</i> Apply bifenthrin to adult females as they swell, prior to crawler hatch. Consider use of spreader-sticker.	

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April

LEGEND






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Late April		
Host Plant	Insect	Disease
Ash	 Lilac Borer Spray Perm-UP 3.2 EC or OnyxPro® 1 week after dogwood full bloom.	
Plum, Cherry		 Black Knot Spray Daconil Weather Stik® after bud break once rainy periods with temperatures above 55 F are expected. Applications continue while shoots are elongating until 2-3 weeks after bloom.
Crabapple		 R Scab Spray at pink bud and petal fall plus 2 more times at 10 day intervals to reduce primary inoculum. Banner MAXX®, 3336®F, Daconil Weather Stik®, Eagle® 20EW, Fore™ 80 WP Rainshield™. <i>Do not grow Scab susceptible crabapples in nursery.</i>
Rosaceae (if still in bloom)		 R Fireblight Spray when 25% and again when 75% of blooms are open with streptomycin sulfate. Use the MARYBLYT or Cougar Blight program to predict the need to spray.
Crabapple, Hawthorn, Serviceberry		 R Rust Spray Banner MAXX®, Daconil Weather Stik®, Eagle® 20EW, Fore™ 80 WP Rainshield™, Strike® 50WDG as new growth appears and flower buds open. Repeat 3-4 times at 7-14 day intervals

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May






LEGEND







-  Try resistant varieties
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Early May		
Host Plant	Insect	Disease
Ornamental Fruit Trees	 Lesser Peachtree Borer Spray Perm-UP 3.2 EC or OnyxPro® 2 weeks after kousa dogwood is at 1 st bloom.	
White Birch	 Bronze Birch Borer Spray Perm-UP 3.2 EC or OnyxPro® when Washington hawthorn is at 1 st bloom.	
Crabapple		 R Scab Spray at pink bud and petal fall plus 2 more times at 10 day intervals to reduce primary inoculum. Banner MAXX®, 3336®F, Daconil Weather Stik®, Eagle® 20EW, Fore™ 80 WP Rainshield™. <i>Do not grow Scab susceptible crabapples in nursery.</i>
Crabapple, Hawthorn, Serviceberry		 R Rust Spray Banner MAXX®, Weather Stik®, Eagle® 20EW, Fore™ 80 WP Rainshield™, Strike® 50WDG as new growth appears and flower buds open. Repeat 3-4 times at 7-14 day intervals.
Crabapple, Dogwood, Hawthorn, Red Maple, Oak, and others	 Flatheaded Appletree Borer Spray Perm-UP 3.2 EC or OnyxPro® when Washington hawthorn is in full bloom.	

May






LEGEND






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Mid May		
Host Plant	Insect	Disease
Ornamental Fruit Trees	 Aphids Scout/Spray Endeavor™, Omni Supreme Spray oil, Safari™ 20SC, TriStar® 30 SG when 150 aphids present on 7/10 shoots. Later in the season treatment is unnecessary.	
Dogwood	 Dogwood Borer Spray Perm-UP 3.2 EC or OnyxPro®, when Washington hawthorn is 1 week after 1 st bloom.	
Crabapple		 R Scab Spray at pink bud and petal fall plus 2 more times at 10 day intervals to reduce primary inoculum. Banner MAXX®, Weather Stik®, Eagle® 20EW, Fore™ 80 WP Rainshield™. <i>Do not grow Scab susceptible crabapples in nursery.</i>
Crabapple, Hawthorn, Serviceberry		 R Rust Spray Banner MAXX®, Daconil Weather Stik, Eagle® 20EW, Fore™ 80 WP Rainshield™, Strike® 50WDG as new growth appears and flower buds open. Repeat 3-4 times at 7-14 day intervals.
Crabapple, Elm, Dogwood, Maple, Honeylocust, Zelkova, others	  Calico Scale Use tape, degree days, and/or presence of dark females to schedule a bifenthrin application with crawler emergence, if missed application to adult females.	

May

LEGEND






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Late May		
Host Plant	Insect	Disease
Magnolia, Tuliptree	 Yellow Poplar Weevil Apply Carbaryl 4L or Orthene® Turf, Tree and Ornamental Spray 97, when 10% of branches damaged, repeat as necessary.	
Maple, Redbud	 Leafhoppers Scout/spray Carbaryl 4L, Talstar® Nursery Flowable, TriStar® 30 SG, Decathlon 20 WP 20 WP, Scimitar® GC® GC when 1 hopper/branch, sample 4 branches/tree on ten trees.	
Dogwood, Maple, Oak	  Thrips Scout/ spray Conserve® SC, Carbaryl 4L, Orthene® Turf, Tree and Ornamental Spray 97, Safari™ 20SC. Use blue sticky cards to monitor.	
Crabapple, Dogwood, Hawthorn		 R Powdery Mildew Spray at first sign of disease and repeat at 14 day intervals with Banner MAXX®, Heritage, Strike® 50WDG. Diligently spray susceptible dogwood cultivars.

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June






LEGEND





-  **R** Try resistant varieties
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-  Scout before spraying; pest occurrence varies
-  Use traps or phenology to monitor when to spray
-  Monitor weather to predict the need to spray

Early June		
Host Plant	Insect	Disease
Birch	R Bronze Birch Borer Spray Perm-UP 3.2 EC or OnyxPro®.	
Crabapple, Dogwood, Hawthorn		 R Powdery Mildew Spray at first sign of disease and repeat at 14 day intervals with Banner MAXX®, Heritage, Strike® 50WDG. Diligently spray susceptible dogwood cultivars.
Ornamental Fruit Trees	 Peachtree Borer Spray Perm-UP 3.2 EC or OnyxPro® two weeks after Southern magnolia 1 st bloom.	
Various Species	 R Japanese Beetle Spray June-July-August with Deltagard® GC, Carbaryl 4L, Safari™ 20SC.	
Baldcypress, Flowering Fruit Trees, Maple, Evergreens, others	 Bagworms Scout/spray <i>Bacillus thuringiensis</i> (BT) on larvae <1/2 inches long. If >1/2" larvae, use Carbaryl 4L, Decathlon 20 WP, Scimitar® GC, Talstar® Nursery Flowable.	

June






LEGEND





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Mid June		
Host Plant	Insect	Disease
Ornamental Fruit Trees, Hawthorn, Maple, Oak	Flatheaded Appletree Borer Spray Perm-UP 3.2 EC or OnyxPro®.	
Crabapple, Dogwood Hawthorn		 R Powdery Mildew Spray at first sign of disease and repeat at 14 day intervals with Banner MAXX®, Heritage, Strike® 50WDG. Diligently spray susceptible dogwood cultivars.
Late June		
Honeylocust	 Mimosa Webworm Scout/spray Carbaryl 4L, Talstar® Nursery Flowable, Scimitar® GC.	
Maple, Redbud	 Leafhoppers Scout/spray Carbaryl 4L, Talstar® Nursery Flowable, TriStar 30 SG, Decathlon 20 WP, Scimitar® GC.	
Maple, Honeylocust	 Spider Mites Scout/spray Avid® 0.15EC®, Floramite® SC, Shuttle™ 15 SC, Talstar® Nursery Flowable, Omni Supreme Spray oil, Orthene® Turf Tree and Ornamental Spray 97, Conserve® SC® SC when 24 mites per 4 branches, sample 10 trees. Look for predatory mites. Avoid use of Carbaryl 4L.	

June





LEGEND




-  Try resistant varieties
-  Pruning and sanitation help control this pest
-  Scout before spraying; pest occurrence varies
-  Use traps or phenology to monitor when to spray
-  Monitor weather to predict the need to spray

Late June		
Host Plant	Insect	Disease
Crabapple, Hawthorn, Dogwood		 R Powdery Mildew Spray at first sign of disease and repeat at 14 day intervals with Banner MAXX®, Heritage, Strike® 50WDG. Diligently spray susceptible dogwood cultivars.
Ornamental Fruit Trees	 Lesser Peachtree Borer Spray Perm-UP 3.2 EC or OnyxPro®.	
Early July		
Host Plant	Insect	Disease
Various Species	 Japanese Beetle Spray June-July-early August with Carbaryl 4L, Deltagard® GC, Safari™ 20SC	
Crabapple, Hawthorn, Dogwood		 R Powdery Mildew Spray at first sign of disease and repeat at 14 day intervals with Banner MAXX®, Heritage, Strike® 50WDG. Diligently spray susceptible dogwood cultivars.
Catalpa, Cherry, Elm, Goldenraintree, Ky Coffeetree, Magnolia, Maple, Redbud, Smoke tree, Tuliptree, Yellowwood, others		R Verticillium Wilt Scout trees for sudden wilting and dead leaves, first occurring during drought stress. Practice strict nursery hygiene. Rogue infected trees. Use resistant varieties.

July

LEGEND





- R** Try resistant varieties
-  Pruning and sanitation help control this pest
-  Scout before spraying; pest occurrence varies
-  Use traps or phenology to monitor when to spray
-  Monitor weather to predict the need to spray






Mid July		
Host Plant	Insect	Disease
Crabapple, Hawthorn, Dogwood		 R Powdery Mildew Spray at first sign of disease and repeat at 14 day intervals with Banner MAXX®, Heritage, Strike® 50WDG. Diligently spray susceptible dogwood cultivars.
Maple, Honeylocust	 Spider Mites Scout/spray Avid® 0.15EC, Floramite®SC, Shuttle™ 15 SC, Talstar® Nursery Flowable, Omni Supreme Spray oil, Orthene® Turf, Tree, and Ornamental Spray 97, Conserve® SC when 24 mites per 4 branches, sample 10 trees. Look for predatory mites. Avoid use of Carbaryl 4L.	
Ornamental Fruit Trees	 Peachtree Borer Spray Perm-UP 3.2 EC or OnyxPro®.	

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August






LEGEND

- R** Try resistant varieties
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-  Scout before spraying; pest occurrence varies
-  Use traps or phenology to monitor when to spray
-  Monitor weather to predict the need to spray

Early August		
Host Plant	Insect	Disease
Ash	 Banded Ash Borer Spray Perm-UP 3.2 EC or OnyxPro®.	
Crabapple, Hawthorn, Dogwood		 R Powdery Mildew Spray at first sign of disease and repeat at 14 day intervals with Banner MAXX®, Heritage, Strike® 50WDG. Diligently spray susceptible dogwood cultivars.
Various Species	 R Japanese Beetle Spray June-July-early August with Carbaryl 4L or Deltagard® GC.	
Mid August		
Tuliptree	 Tuliptree Scale Spray Carbaryl 4L or Omni Supreme Spray oil to control crawler stage.	
Maple, Honeylocust	 Spider Mites Scout/spray Avid® 0.15EC, Floramite®SC, Shuttle™ 15 SC, Talstar® Nursery Flowable, Omni Supreme Spray oil, Orthene® Turf, Tree and Ornamental Spray 97, Conserve® SC when 24 mites per 4 branches, sample 10 trees. Look for predatory mites. Avoid use of Carbaryl 4L.	

September

LEGEND

-  Try resistant varieties
-  Pruning and sanitation help control this pest
-  Scout before spraying; pest occurrence varies
-  Use traps or phenology to monitor when to spray
-  Monitor weather to predict the need to spray

Early September		
Oak, Maple, Sycamore, and Sweet Gum		R Bacterial Leaf Scorch Remove infected trees following diagnosis.

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Disease Sources:

- Diseases of Trees and Shrubs. Sinclair, Johnson, and Lyon. Cornell University Press. 1987
- Diseases of Woody Ornamentals and Trees in Nurseries. Jones and Benson, eds. American Phytopathological Society Press. 2001
- Avoid Black Knot of Flowering Plums. Ky Pest News. Article 959, July 7, 2002
- http://www.uky.edu/Agriculture/kpn/kpn_02/pn020708.htm#shaavo
- Fireblight. University of Kentucky Publication PPA - 34
- Apple Scab. University of Kentucky Publication PPA - 24
- Disease and Insect Control Programs for Homegrown Fruit in Kentucky Including Organic Alternatives. University of Kentucky Publication ID-21
- Woody Plant Disease Control Guide for Kentucky. University of Kentucky Publication ID - 88
- <http://www.ca.uky.edu/agc/pubs/id/id88/id88.pdf>
- Dogwood Powdery Mildew Update. Kentucky Pest News, Article 925, July 16, 2001
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- Verticillium Wilt of Woody Ornamentals. University of Kentucky Publication PPA - 18
- <http://www.ca.uky.edu/agc/pubs/ppa/ppa18/ppa18.pdf>
- Grape Crown Gall. Ky Pest News. Article 893, July 31, 2000
- http://www.uky.edu/Agriculture/kpn/kpn_00/pn000731.htm#frugra
- Bacterial Scorch is Visible Now. Ky Pest News. Article 898, September 25, 2000
- http://www.uky.edu/Agriculture/kpn/kpn_00/pn000925.htm#shabac

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Insect Sources

- Insect Borers of Trees and Shrubs. University of Kentucky Publication ENT - 42
- <http://www.ca.uky.edu/agc/pubs/ent/ent43/ent43.pdf>
- Commercial Insect and Mite Control for Trees, Shrubs, and Flowers. University of Tennessee Publication PB 1589. Rev 4/02
- Timing Control Actions for Landscape Insect Pests Using Flowering Plants as Indicators. University of Kentucky Publication ENT-66
- Bagworms on Landscape Plants. University of Kentucky ENTFACT - 440
- <http://www.uky.edu/Ag/Entomology/entfacts/pdfs/entfa440.pdf>
- Eastern Tent Caterpillar. University of Kentucky ENTFACT - 423
- <http://www.uky.edu/Agriculture/Entomology/entfacts/pdfs/entfa423.pdf>
- Japanese Beetles. University of Kentucky ENTFACT - 409
- <http://www.uky.edu/Ag/Entomology/entfacts/pdfs/entfa409.pdf>
- Yellow Poplar Weevil. University of Kentucky ENTFACT - 414
- <http://www.uky.edu/Agriculture/Entomology/entfacts/pdfs/entfa414.pdf>
- Tuliptree Scale. University of Kentucky ENTFACT - 435
- <http://www.uky.edu/Ag/Entomology/entfacts/pdfs/entfa435.pdf>

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Appendix 1. Inspect New Liners for Pests

Diseases*

- **Verticillium Wilt** - *Acer, Catalpa, Cercis, Cladrastis, Cotinus, Gymnocladus, Koelreutaria, Liriodendron, Magnolia, Prunus, Ulmus*
- **Black Root Rot** – *Catalpa, Ilex, Syringa, Ulmus*
- **Black Knot** - *Prunus*
- **Cedar Quince Rust** – *Crataegus*
- **Fusicoccum Canker** – *Fraxinus*
- **Aerial Phytophthora** - *Fraxinus*
- **Crown Gall** - All
- **Nectria/Thionectria** - *Gleditsia*

Insects*

- **Eastern Tent Caterpillar** – *Prunus*
- **Scale**

Weeds*

- **Nutsedge** - All
- **Johnson grass** – All
- **Garlic** - All

* These are only partial lists of pests and associated host plants.

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