

## Miscellaneous Insects

Mussey, G. J.; Potter, D. A. 1997. Phenological correlations between flowering plants and activity of urban landscape pests in Kentucky. *Journal of Economic Entomology* 90: 1615-1627.

**Objective:** To predict pest activity based on the phenology of indicator plants.

**Abstract:** Pest management decisions are often based on calendar dates because frequent monitoring and sampling, which are more effective means of gauging the need for control measures, can be time consuming and labor intensive. A phenology calendar that correlates pest activity to the flowering of common indicator plants may be more useful for landscape managers with little knowledge of pest life cycles or appropriate sampling methodology. Such calendars allow managers to predict when insect pests are likely to be in a life stage vulnerable to control measures. Additional scouting can confirm the presence of vulnerable life stages of a given pest and when most of the population has entered this stage.

**Sampling Procedure:** Use Table 4 to identify phenological events of common plants associated with the presence of selected insect pests of forest and shade trees. Consider applying control measures during the given phenological events, but after most of the pest population has entered the life stage vulnerable to control. Use Table 6 to compare the average dates of phenological events between Louisville, Kentucky and Midland, Michigan (Herms 1990).

**Note:** The phenology calendar was developed in central Kentucky and may be appropriate for surrounding states, but should be used with caution in other regions.

### Reference:

Herms, D. A. 1990. Biological clocks. *American Nurseryman* 172: 56-63.

## Tables

Table 4. Phenological sequence of woody plant flowering and insect events in Lexington, KY, 1992-1994

Insects	Indicator plant	Phenological event	3-yr. Avg
	<i>Acer saccharinum</i> L.	1st bloom	18 Feb.
	<i>Cornus mas</i> L.	1st bloom	21 Feb.
	<i>Acer saccharinum</i> L.	50% bloom	24 Feb.
	<i>Cornus mas</i> L.	50% bloom	03 Mar.
	<i>Acer saccharinum</i> L.	95% bloom	10 Mar.
	<i>Forsythia x intermedia</i> Zabel	1st bloom	12 Mar.
	<i>Cornus mas</i> L.	95% bloom	13 Mar.
<b>Eastern tent caterpillar, <i>Malacosoma americanum</i> (F.)</b>		Egg hatch	16 Mar.
	<i>Berberis x mentorensis</i> L. M. Ames	50% bloom	09 Apr.
	<i>Amelanchier arborea</i> (Michaux, F.) Fernald	50% bloom	09 Apr.
	<i>Viburnum x juddii</i> Rehder	1st bloom	10 Apr.
	<i>Magnolia x soulangiana</i> Soulange-Bodin	95% bloom	11 Apr.
	<i>Acer platanooides</i> L.	50% bloom	11 Apr.
	<i>Amelanchier arborea</i> (Michaux, F.) Fernald	95% bloom	11 Apr.
	<i>Malus floribunda</i> Van Houtte	1st bloom	11 Apr.
	<i>Berberis x mentorensis</i> L. M. Ames	95% bloom	13 Apr.
	<i>Viburnum x juddii</i> Rehder	50% bloom	13 Apr.
	<i>Cercis canadensis</i> L.	1st bloom	14 Apr.
	<i>Malus floribunda</i> Van Houtte	50% bloom	15 Apr.
	<i>Syringa vulgaris</i> L.	1st bloom	15 Apr.
	<i>Acer platanooides</i> L.	95% bloom	15 Apr.
	<i>Aesculus x carnea</i> Hayne	1st bloom	16 Apr.
	<i>Malus sargentii</i> Rehder	1st bloom	16 Apr.
	<i>Cornus florida</i> L.	50% bloom	17 Apr.
	<i>Cercis canadensis</i> L.	50% bloom	17 Apr.
	<i>Viburnum x juddii</i> Rehder	95% bloom	17 Apr.
	<i>Prunus serrulata</i> Lindley 'Kwansan'	1st bloom	19 Apr.
	<i>Prunus serrulata</i> Lindley 'Kwansan'	50% bloom	19 Apr.
<b>Honeylocust plant bug, <i>Diaphnocoris chlorionis</i> (Say)</b>		Emergence	20 Apr.

<i>Syringa vulgaris</i> L.	50% bloom	20 Apr.
<i>Malus sargentii</i> Rehder	50% bloom	20 Apr.
<i>Prunus serrulata</i> Lindley 'Kwansan'	95% bloom	20 Apr.
<b>Birch leafminer, <i>Fenusa pusilla</i> (Lepelletier)</b>	Emergence	21 Apr.
<i>Malus floribunda</i> Van Houtte	95% bloom	21 Apr.
<i>Cercis canadensis</i> L.	95% bloom	21 Apr.
<i>Cornus florida</i> L.	95% bloom	22 Apr.
<b>Hawthorn lace bug, <i>Corythucha cydoniae</i> (Fitch)</b>	Emergence	22 Apr.
<i>Malus sargentii</i> Rehder	95% bloom	23 Apr.
<b>Oystershell scale, <i>Lepidosaphes ulmi</i> (L.)</b>	Egg hatch	23 Apr.
<b>Yellow poplar weevil, <i>Odontopus calceatus</i> (Say)<sup>a</sup></b>	Emergence	23 Apr.
<i>Syringa vulgaris</i> L.	95% bloom	24 Apr.
<b>Lilac/ash borer, <i>Podosesia syringae</i> (Harris)</b>	1st flight	24 Apr.
<i>Crataegus viridis</i> L. 'Winter King'	1st bloom	27 Apr.
<i>Cornus kousa</i> (Hance)	1st bloom	28 Apr.
<i>Chionanthus virginicus</i> L.	1st bloom	28 Apr.
<i>Aesculus x carnea</i> Hayne	50% bloom	29 Apr.
<b>Pine needle scale, <i>Chionaspis pinifoliae</i> (Fitch)</b>	Egg hatch	30 Apr.
<i>Pyracantha coccinea</i> Roemer	50% bloom	08 May
<i>Cladrastris kentuckea</i> Rudd	1st bloom	08 May
<i>Ilex opaca</i> Aiton, R.	1st bloom	08 May
<i>Lonicera tatarica</i> L.	95% bloom	11 May
<i>Ilex opaca</i> Aiton, R.	50% bloom	11 May
<i>Cladrastris kentuckea</i> Rudd	50% bloom	12 May
<i>Cornus kousa</i> (Hance)	95% bloom	13 May
<i>Pyracantha coccinea</i> Roemer	95% bloom	14 May
<b>Juniper scale, <i>Carulaspis juniperi</i> (Bouché)</b>	Egg hatch	15 May
<i>Ilex opaca</i> Aiton, R.	95% bloom	17 May
<i>Cladrastris kentuckea</i> Rudd	95% bloom	17 May
<b>Bagworm, <i>Thyridopteryx ephemeraeformis</i> (Haworth)</b>	Egg hatch	18 May
<b>Dogwood borer, <i>Synanthedon scitula</i> (Harris)</b>	1st flight	20 May
<i>Crataegus phaenopyrum</i> (L. f.) Medicus	1st bloom	21 May
<b>Bronze birch borer, <i>Agrilus anxius</i> Gory</b>	Emergence	22 May
<i>Tilia cordata</i> Miller	1st bloom	23 May

<i>Syringia reticulata</i> (Blume)	1st bloom	23 May
<i>Catalpa speciosa</i> Warder	1st bloom	24 May
<b>Calico scale, <i>Eulecanium cerasorum</i> (Cockerell)</b>	Egg hatch	24 May
<i>Crataegus phaenopyrum</i> (L. f.) Medicus	50% bloom	24 May
<i>Hydrangea quercifolia</i> Bartrum	1st bloom	27 May
<i>Catalpa speciosa</i> Warder	50% bloom	27 May
<b>Flatheaded appletree borer, <i>Chrysobothris femorata</i> (Olivier)</b>	Emergence	28 May
<i>Crataegus phaenopyrum</i> (L. f.) Medicus	95% bloom	28 May
<i>Syringia reticulata</i> (Blume)	50% bloom	29 May
<b>Twolined chestnut borer, <i>Agrilus bilineatus</i> (Weber)</b>	Emergence	29 May
<i>Magnolia grandiflora</i> L.	1st bloom	30 May
<i>Catalpa speciosa</i> Warder	95% bloom	31 May
<i>Syringia reticulata</i> (Blume)	95% bloom	02 Jun.
<i>Hydrangea quercifolia</i> Bartrum	50% bloom	02 Jun.
<b>Japanese beetle, <i>Popillia japonica</i> Newman</b>	1st flight	04 Jun.
<i>Tilia cordata</i> Miller	50% bloom	07 Jun.
<b>Honeylocust borer, <i>Agrilus difficilis</i> Gory<sup>a</sup></b>	Emergence	07 Jun.
<i>Hydrangea quercifolia</i> Bartrum	95% bloom	07 Jun.
<i>Magnolia grandiflora</i> L.	50% bloom	08 Jun.
<b>Walnut scale, <i>Quadraspidiotus juglansregiae</i> (Comstock)</b>	Egg hatch	09 Jun.
<i>Tilia cordata</i> Miller	95% bloom	09 Jun.
<b>Cottony maple leaf scale, <i>Pulvinaria acericola</i> (Walsh &amp; Riley)<sup>a</sup></b>	Egg hatch	11 Jun.
<i>Koelreuteria paniculata</i> Laxmann	1st bloom	16 Jun.
<i>Abelia x grandiflora</i> (André) Rehder	1st bloom	23 Jun.
<i>Koelreuteria paniculata</i> Laxmann	50% bloom	24 Jun.
<i>Koelreuteria paniculata</i> Laxmann	95% bloom	26 Jun.
<b>Obscure scale, <i>Melanaspis obscura</i> (Comstock)</b>	Egg hatch	06 Jul.

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<sup>a</sup>Not a common name approved by the Entomological Society of America.

Table 6. Phenological sequence of 10 insects and 25 plant events common to the present study and Herms (1990) study in Michigan.

Kentucky sequence		Michigan sequence	
Insects	Avg date	Insects	Avg date
Plants		Plants	
<i>Acer saccharinum</i> L. (1st)	18 Feb.	<i>Acer saccharinum</i> L. (1st)	29 Mar.
<i>Cornus mas</i> L. (1st)	21 Feb.	<i>Cornus mas</i> L. (1st)	09 Apr.
<i>Forsythia x intermedia</i> Zabel (1st)	12 Mar.	<b>Eastern tent caterpillar, <i>Malacosoma americanum</i> (F.)</b>	09 Apr.
<b>Eastern tent caterpillar, <i>Malacosoma americanum</i> (F.)</b>	16 Mar.	<i>Forsythia x intermedia</i> Zabel (1st)	16 Apr.
<i>Magnolia stellata</i> (Seibold & Zaccarini) (1st)	19 Mar.	<i>Magnolia stellata</i> (Seibold & Zaccarini) (1st)	18 Apr.
<i>Rhododendron</i> 'PMJ' (1st)	22 Mar.	<i>Acer platanoides</i> L. (1st)	23 Apr.
<i>Pyrus calleryana</i> Decaisne 'Bradford' (1st)	23 Mar.	<i>Rhododendron</i> 'PMJ' (1st)	27 Apr.
<i>Amelanchier arborea</i> (Michaux, F.) Fernald (1st)	05 Apr.	<i>Pyrus calleryana</i> Decaisne 'Bradford' (1st)	28 Apr.
<i>Acer platanoides</i> L. (1st)	06 Apr.	<i>Amelanchier arborea</i> (Michaux, F.) Fernald (1st)	30 Apr.
<i>Viburnum x juddii</i> Rehder (1st)	10 Apr.	<i>Cercis canadensis</i> L. (1st)	04 May
<i>Malus floribunda</i> Van Houtte (1st)	11 Apr.	<b>Birch leafminer, <i>Fenusa pusilla</i> (Lepelletier)</b>	05 May
<i>Cercis canadensis</i> L. (1st)	14 Apr.	<i>Prunus serrulata</i> Lindley 'Kwansan' (1st)	06 May
<i>Syringa vulgaris</i> L. (1st)	15 Apr.	<i>Viburnum carlesi</i> (1st)	06 May
<i>Malus sargentii</i> Rehder (1st)	16 Apr.	<i>Malus floribunda</i> Van Houtte (1st)	07 May
<i>Prunus serrulata</i> Lindley 'Kwansan' (1st)	19 Apr.	<i>Syringa vulgaris</i> L. (1st)	09 May
<b>Birch leafminer, <i>Fenusa pusilla</i> (Lepelletier)</b>	21 Apr.	<i>Malus sargentii</i> Rehder (1st)	10 May
<b>Oystershell scale, <i>Lepidosaphes ulmi</i> (L.)</b>	23 Apr.	<i>Lonicera tatarica</i> L. (1st)	12 May
<i>Viburnum plicata</i> var. <i>tomentosum</i> (Thunberg) (1st)	23 Apr.	<i>Viburnum plicata</i> var. <i>tomentosum</i> (Thunberg) (1st)	16 May
<b>Lilac/ash borer, <i>Podosesia syringae</i> (Harris) (1st)</b>	24 Apr.	<b>Lilac/ash borer, <i>Podosesia syringae</i> (Harris) (1st)</b>	17 May
<i>Lonicera tatarica</i> L. (1st)	25 Apr.	<b>Oystershell scale, <i>Lepidosaphes ulmi</i> (L.)</b>	20 May

<i>Crataegus viridis</i> L. 'Winter King' (1st)	27 Apr.	<i>Crataegus viridis</i> L. 'Winter King' (1st)	25 May
<i>Chionanthus virginicus</i> L. (1st)	28 Apr.	<i>Chionanthus virginicus</i> L. (1st)	28 May
<b>Juniper scale, <i>Carulaspis juniperi</i> (Bouché)</b>	15 May	<b>Bronze birch borer, <i>Agrilus anxius</i> Gory</b>	02 Jun.
<b>Bronze birch borer, <i>Agrilus anxius</i> Gory</b>	22 May	<i>Crataegus phaenopyrum</i> (L. f.) Medicus (1st)	12 Jun.
<i>Crataegus phaenopyrum</i> (L. f.) Medicus (1st)	21 May	<b>Juniper scale, <i>Carulaspis juniperi</i> (Bouché)</b>	12 Jun.
<i>Syringia reticulata</i> (Blume) (1st)	23 May	<i>Syringia reticulata</i> (Blume) (1st)	13 Jun.
<i>Tilia cordata</i> Miller (1st)	23 May	<i>Catalpa speciosa</i> Warder (1st)	15 Jun.
<i>Catalpa speciosa</i> Warder (1st)	24 May	<i>Crataegus phaenopyrum</i> (L. f.) Medicus (95%)	18 Jun.
<i>Crataegus phaenopyrum</i> (L. f.) Medicus (95%)	28 May	<i>Tilia cordata</i> Miller (1st)	22 Jun.
<i>Tilia cordata</i> Miller (95%)	09 Jun.	<b>Cottony maple leaf scale, <i>Pulvinaria acericola</i> (Walsh &amp; Riley) <sup>a</sup></b>	25 Jun.
<b>Cottony maple leaf scale, <i>Pulvinaria acericola</i> (Walsh &amp; Riley) <sup>a</sup></b>	11 Jun.	<i>Tilia cordata</i> Miller (95%)	27 Jun.
<i>Koelreuteria paniculata</i> Laxmann (1st)	26 Jun.	<i>Koelreuteria paniculata</i> Laxmann (1st)	05 Jul.

Designation in parentheses after plant names refers to 1st or 95% bloom.

<sup>a</sup>Not a common name approved by the Entomological Society of America.

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