



ANSI A300 Tree Care Standards
for trees, shrubs, palms, and other woody landscape plants

ANSI A300-2023 Tree Care Standards

Revision, redesignation, and consolidation of:

- | | |
|-----------------------|-------------------------------|
| ANSI A300 Part 1-2017 | ANSI A300 Part 6-2012 (R2018) |
| ANSI A300 Part 2-2018 | ANSI A300 Part 7-2018 |
| ANSI A300 Part 3-2013 | ANSI A300 Part 8-2019 |
| ANSI A300 Part 4-2014 | ANSI A300 Part 9-2017 |
| ANSI A300 Part 5-2019 | ANSI A300 Part 10-2016 |

14 Integrated Pest Management standards

A300 IPM Process Flowchart

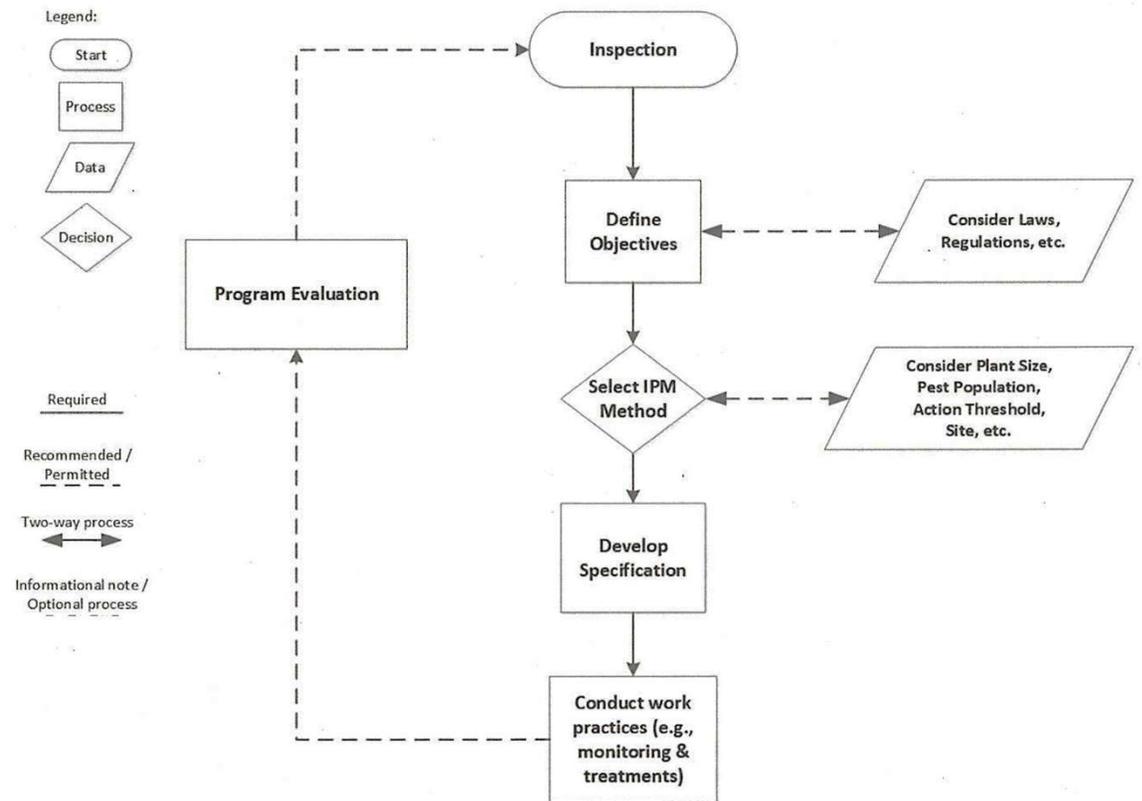


Fig. 14 IPM process flowchart.

From ANSI A-300 Glossary

Integrated Pest Management (IPM)

A sustainable approach to managing pests by combining biological, cultural, physical and chemical tools in a way that minimizes health, environmental and economic risks. Choice of tactics is based on effectiveness, environmental impact, site characteristics, safety, economics and client expectations and preferences.





Diagnosing Tree Problems:

- **Make Careful Observations** - “the primary responsibility of a good diagnostician”
- **Use Good Judgment** - make use of common sense, want to know more about the problem, persist in your inquiry until the problem is solved, avoid quick judgments, ask for help, look things up!
- **Understand the Tree**
- **Understand the Causes of Tree Problems**
- **Ask Questions** - learn the tree’s history
- **Learn the Tree’s Environment**

Also Important -

The Need to Monitor!

**Landscapes are dynamic
with things changing all of
the time.**

**What was true last year or
last month may not be now!**





Oak Leaf Blister

Oak leaf blister (oak leaf curl) is a fungal leaf disease caused by the fungus *Taphrina caerulescens*. Circular, raised areas ranging up to 2 inches in diameter are scattered over the upper leaf surface. During cool wet springs, almost all species of oak are subject to the leaf blister disease. Members of the red oak family are particularly susceptible to infection.

A single application of a fungicide applied in the spring at the time of bud-swelling is usually adequate. Apply with a power sprayer and coat buds and twigs thoroughly for good control. Chlorothalonil (Daconil) is currently registered for use in controlling oak leaf blister. Fungicides will not be effective if applied after bud break

From Wikipedia:

Chlorothalonil (2,4,5,6-tetrachloroisophthalonitrile) is an organic compound mainly used as a broad spectrum, nonsystemic fungicide, with other uses as a wood protectant, pesticide, acaricide, and to control mold, mildew, bacteria, algae. Chlorothalonil-containing products are sold under the names Bravo, Echo, and Daconil.

It was first registered for use in the US in 1966. In 1997, the most recent year for which data are available, it was the third most used fungicide in the US, behind only sulfur and copper, with 12 million pounds (5.4 million kilograms) used in agriculture that year. Including nonagricultural uses, the United States Environmental Protection Agency (EPA) estimates, on average, almost 15 million lb (6.8 million kg) were used annually from 1990 to 1996.

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Chlorothalonil = Active ingredient

Chlorothalonil = Common Name

2,4,5,6-tetrachloroisophthalonitrile = Chemical Name

Organic Compound = in chemical sense, not pesticide-use sense

Broad Spectrum = effective against a wide range of pests

Non-Systemic = not absorbed and translocated within the plant

Daconil = Trade Name (brand name registered by the manufacturer)

The Control of Tree Problems and Managing Client's Properties

- **Anticipate Pest Problems**
- **Monitor Trees in the Landscape Regularly**
- **Accurately Determine the Cause of the Problem (if you do not know, get help)**
- **Determine the Right Course of Action**
- **Carry Out the Control Decision Properly**

IPM:

Part II

chemical options

and

the use of pesticides

The Four Pillars of IPM:

- *physical control*
- *cultural control*
- *biological control*
- *chemical control*



• *physical control*



• *cultural control*



• *biological control*



• *chemical control*

Pesticides

what are they?

legal toxins

why use them?















Office

McDonald's

McDonald's

McDonald's

**Pesticides are
an option in
any IPM
Program**

*Pesticide Guide
Toward
Integrated Insect
Management for
Connecticut Arborists*

2019

Prepared by
Rose Hiskes

Valley Laboratory
The Connecticut Agricultural Experiment Station
Windsor, CT 06095-3154

*Disease Management
Guide for
Connecticut Arborists
2015-2016*

Prepared by
Dr. Sharon M. Douglas
Emeritus Plant Pathologist

Department of Plant Pathology and Ecology
The Connecticut Agricultural Experiment Station
New Haven, CT



CAES

The Connecticut Agricultural Experiment Station
Putting Science to Work for Society since 1875



Sources of Information

LARGE HICKORY LECANIUM

Eulecanium caryae

Page 364 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **FOLIAGE**

Host Plants: Common Name	Scientific Name
apple	<i>Malus</i>
beech	<i>Fagus</i>
birch	<i>Betula</i>
cherry, black	<i>Prunus serotina</i>
cherry, flowering	<i>Prunus</i>
hackberry	<i>Celtis occidentalis</i>
hickory	<i>Carya</i>
honeylocust	<i>Gleditsia triacanthos</i>
mulberry	<i>Morus</i>
oak	<i>Quercus</i>
peach	<i>Prunus persica</i>
plum	<i>Prunus cerasifera</i>
sycamore	<i>Platanus occidentalis</i>
walnut	<i>Juglans</i>
willow	<i>Salix</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
nymph (crawler)	May 01	Jul 15	bark to foliage	decline	visual inspection, sticky tape
nymph	Aug 15	Oct 31	foliage to bark	decline	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
nymph, adult	Apr 20 - Apr 30	96 - 137	plants bloom: boxelder, star magnolia, periwinkle, Norway maple
nymph, adult	May 01 - May 10	144 - 228	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
crawler	Jun 20 - Jun 30	737 - 967	plants bloom: Rhododendron maximum, Spiraea bumalda, Philadelphus
crawler	Jul 01 - Jul 10	989 - 1196	plants bloom: Ceanothus americanus, Clematis jackmanii, Tilia cordata

Biological Control

	Comments
<i>Lindorus lophanthae</i> (lady beetle - scale predator)	Available commercially
<i>Cryptolaemus montrouzieri</i> (lady beetle predator)	Available commercially; occurs naturally
<i>Chrysoperla</i> sp. (green lacewing - predator)	Available commercially; occurs naturally
<i>Chilocorus stigma</i> (lady beetle - predator)	occurs naturally

Chemical Control

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
Reference use only. NOT a label substitute. Select the appropriate insecticide/miticide for the correct life stage of the target pest.			
acephate	Acephate 97 WDG	BEE CAUTION	C 24 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide **ESA approved common name ^for agricultural applications only.

Pesticide Guide Toward IPM – page 206

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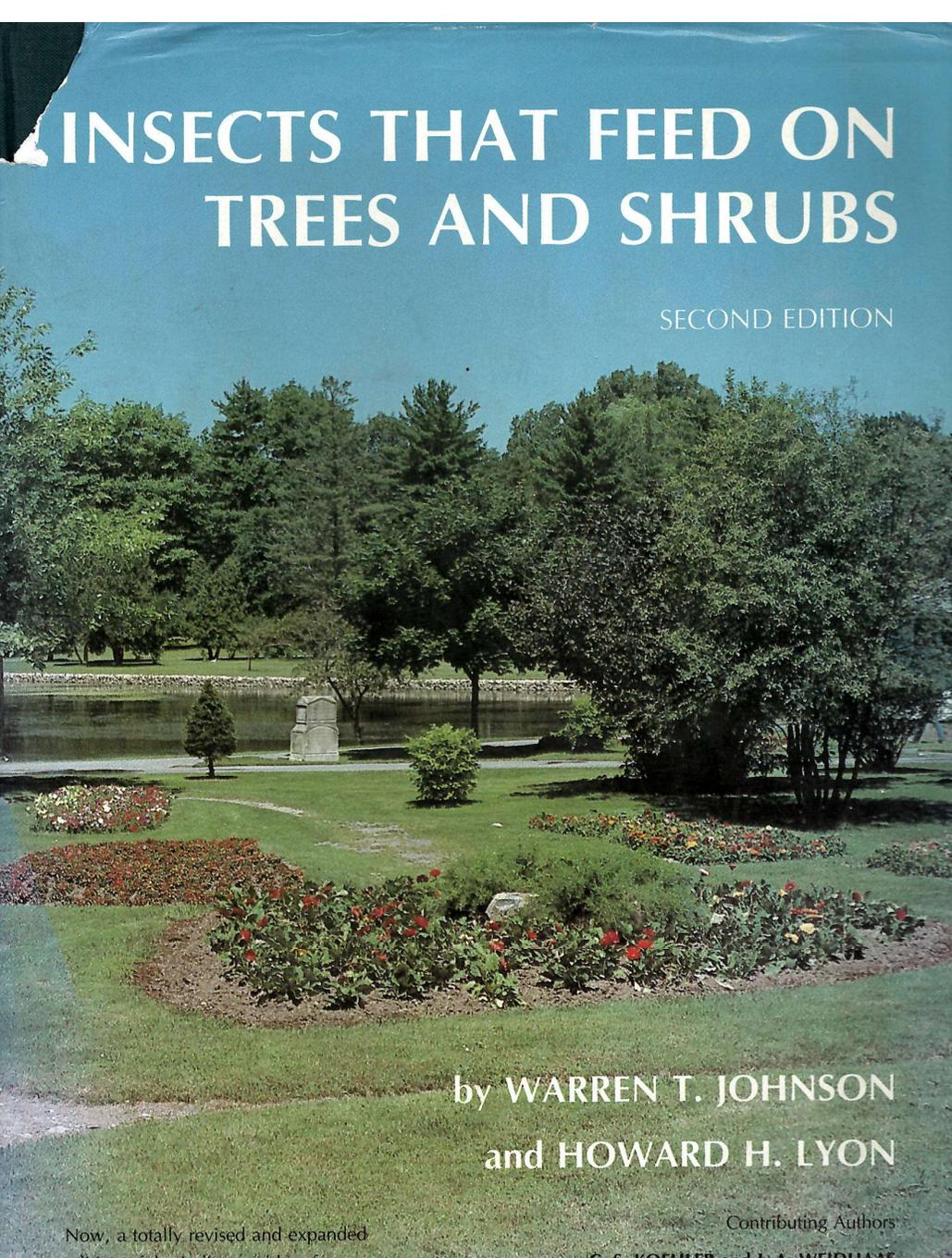
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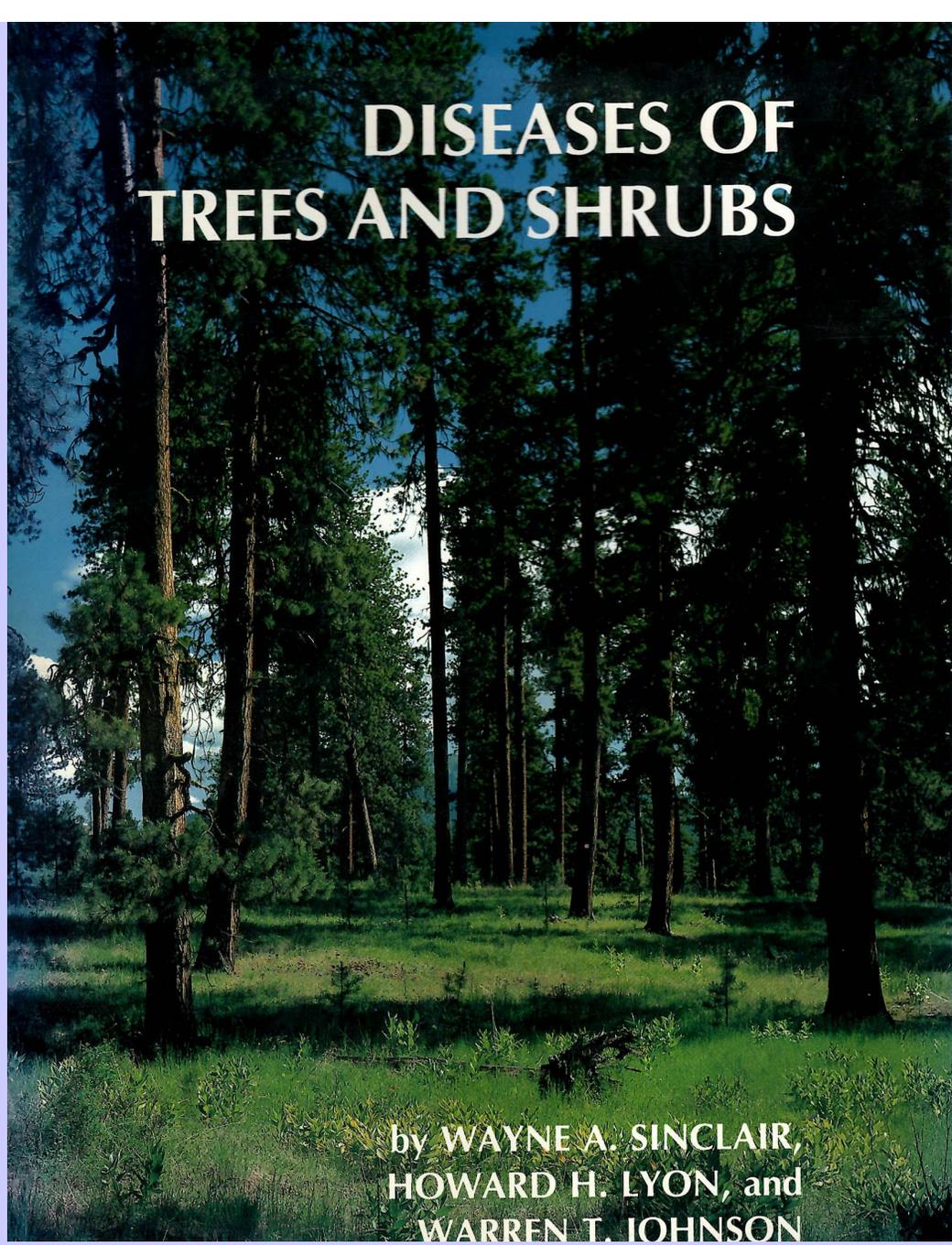
INSECTS THAT FEED ON TREES AND SHRUBS

SECOND EDITION

by WARREN T. JOHNSON
and HOWARD H. LYON

Now, a totally revised and expanded

Contributing Authors



DISEASES OF TREES AND SHRUBS

by WAYNE A. SINCLAIR,
HOWARD H. LYON, and
WARREN T. JOHNSON

The Cornell Books

LARGE HICKORY LECANIUM

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Page 364 (Johnson & Lyon)

Page 205 discusses this insect in the dormant season.

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Chilocorus stigma (lady beetle - predator)

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Chemical Control

Comments

Signal Word

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Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

acephate

Acephate 97 WDG

BEE CAUTION

C

24 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

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Three Approaches to Timing:

- calendar based approach
- growing degree days
- approach based on phenology
(what's in bloom)

sycamore
walnut
willow

Platanus occidentalis
Juglans
Salix

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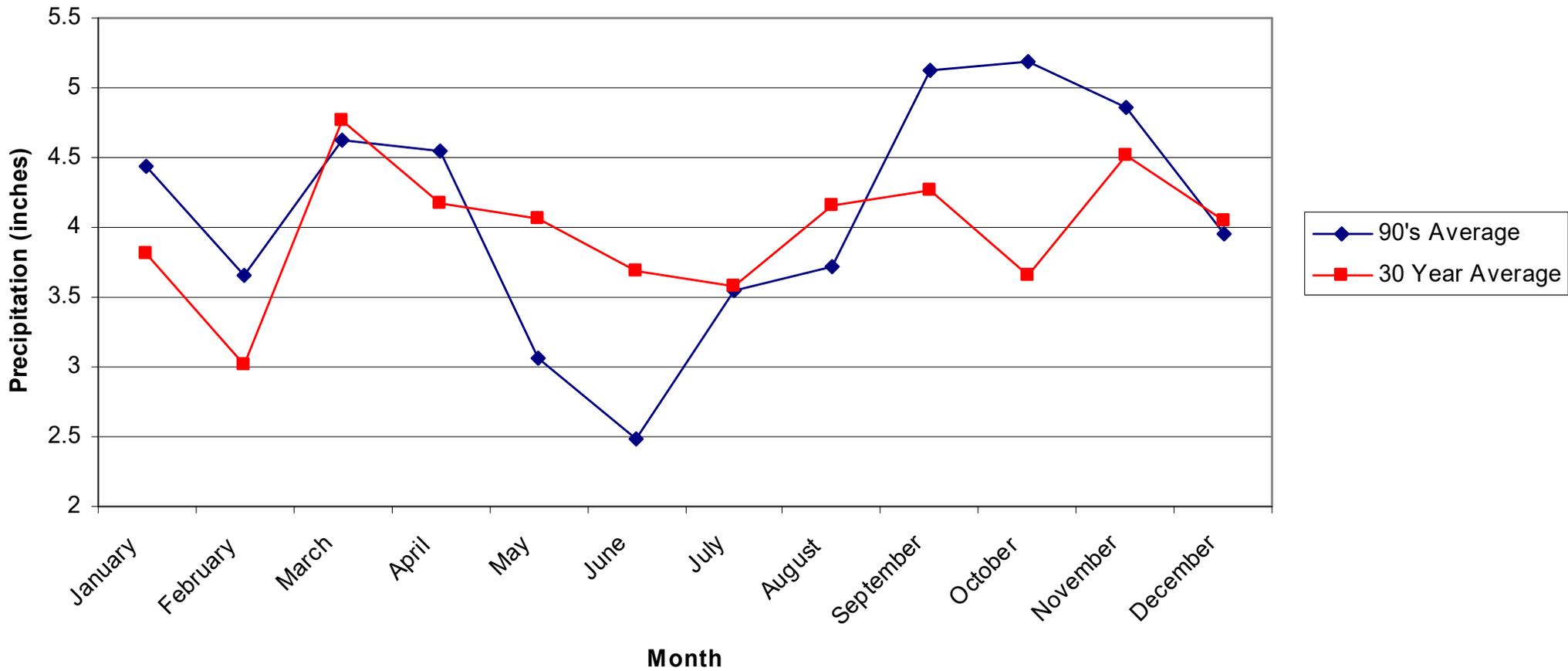
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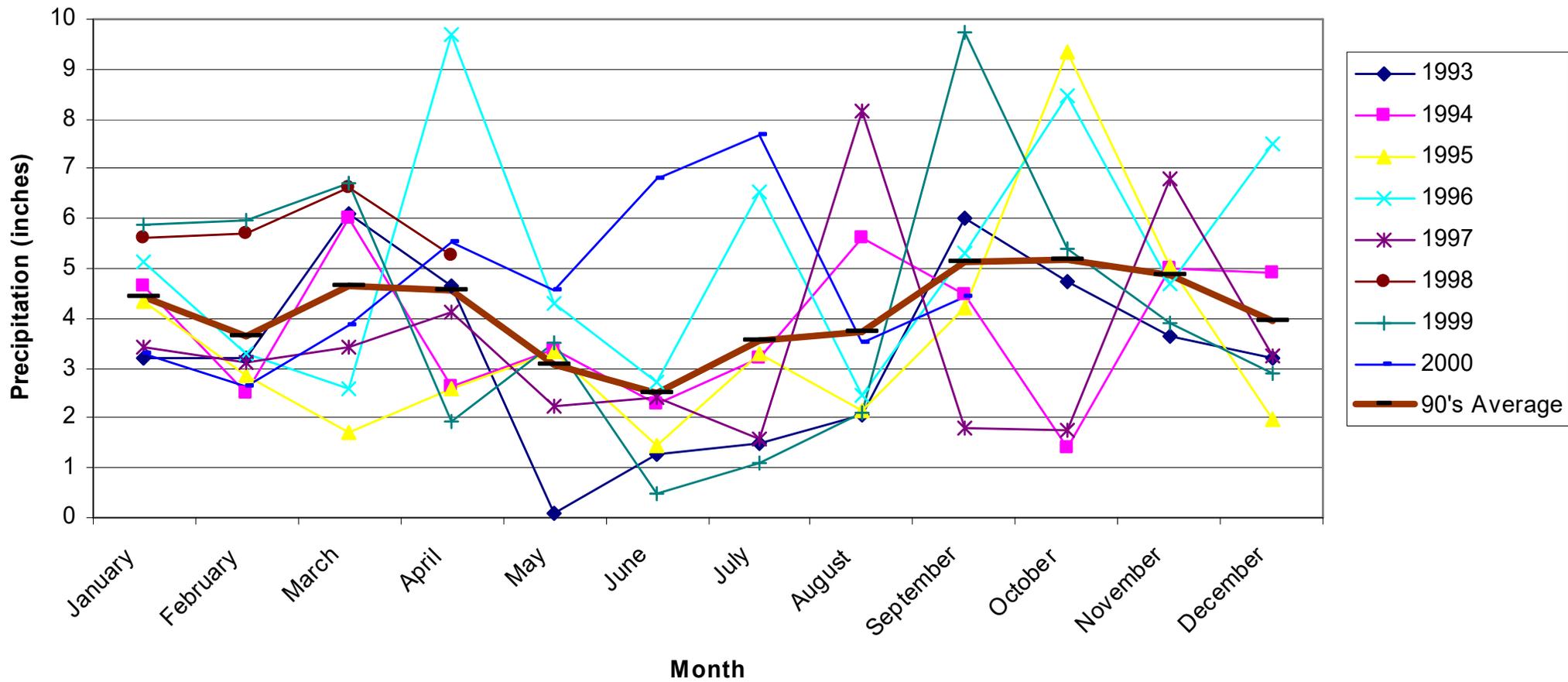
Seasonal Variation:

Lockwood Farm Precipitation Data



Seasonal Variation:

Lockwood Farm Precipitation Data



Growing Degree Days:

- The use of Growing degree days (GDD) is a way of tracking 'heat units' and is used to estimate the growth and development of crops and pests during the growing season.
- It is based on tracking the accumulation of average daily temperatures, starting with a minimum threshold or baseline temperature that must be exceeded for growth to occur.

Growing Degree Days:

To calculate the Growing Degree Days throughout the season:

Start at the beginning of the season (usually March 1).

For each day, add the high and low temperatures of the day together.

Divide this sum by 2.

Subtract the baseline temperature (usually 50 degrees Fahrenheit).

The resulting difference is that day's contribution to the GDD total. If the difference for that day is less than zero, set it equal zero. If it is zero or greater than zero, add to running total for season.

The GDD's for any day in the season is the sum of the contributions of each day to the GDD total, going all the way back to March 1.

Growing Degree Days:

	March 1	March 2	March 3	Total
High Temp	52° F			-
Low Temp	46° F			-
High + Low	98			-
divide by 2	49			-
subtract 50	-1			-
GDD	0			0

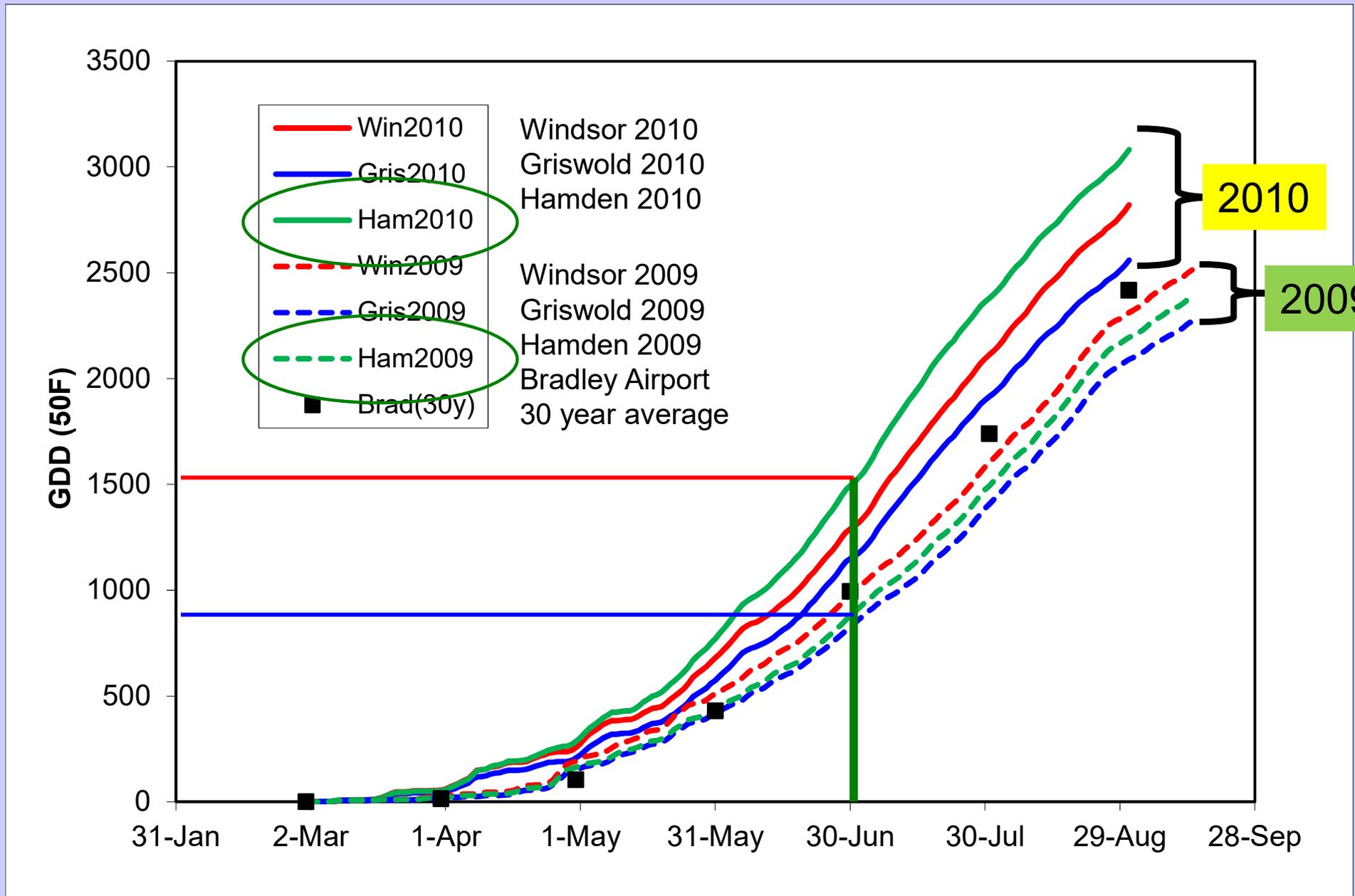
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High Temp	52° F	58° F		-
Low Temp	46° F	48° F		-
High + Low	98	106		-
divide by 2	49	53		-
subtract 50	-1	3		-
GDD	0	3		3

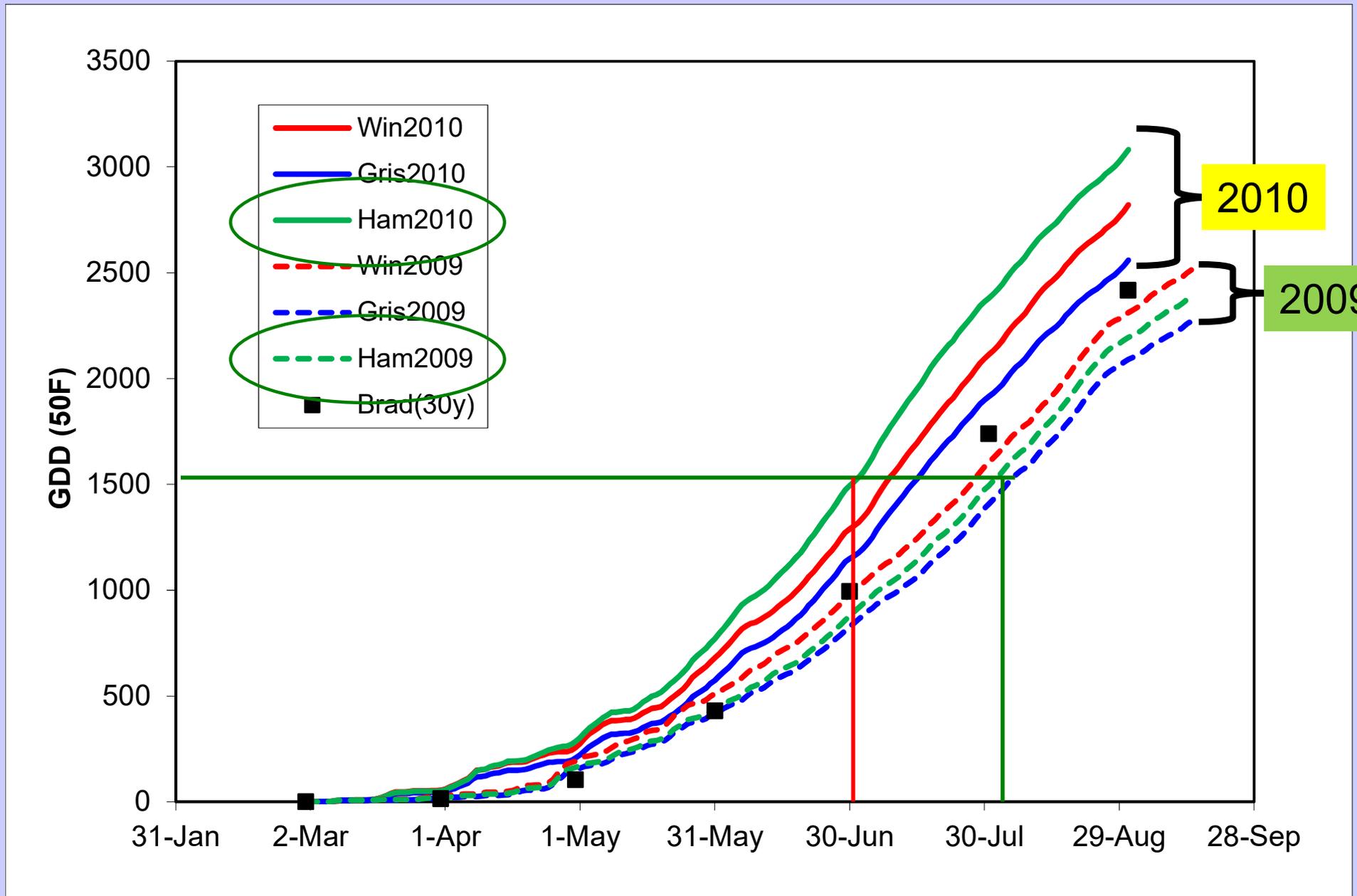
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Low Temp	46° F	48° F	52° F	-
High + Low	98	106	114	-
divide by 2	49	53	57	-
subtract 50	-1	3	7	-
GDD	0	3	7	10

GDD 2009 and 2010



GDD 2009 and 2010



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Platanus occidentalis
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crawler	Jun 20 - Jun 30	737 - 967	plants bloom: Rhododendron maximum, Spiraea bumalda, Philadelphus
crawler	Jul 01 - Jul 10	989 - 1196	plants bloom: Ceanothus americanus, Clematis jackmanii, Tilia cordata

Biological Control

Lindorus lophanthæ (lady beetle - scale predator)
Cryptolaemus montrouzieri (lady beetle predator)
Chrysoperla sp. (green lacewing - predator)
Chilocorus stigma (lady beetle - predator)

Comments

Available commercially
Available commercially; occurs naturally
Available commercially; occurs naturally
occurs naturally

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

Comments

BEE CAUTION

Signal Word

C

Agricultural
Restricted Entry
Interval (REI)^

24 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

Phenology:



sycamore
walnut
willow

Platanus occidentalis
Juglans
Salix

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
nymph (crawler)	May 01	Jul 15	bark to foliage	decline	visual inspection, sticky tape
nymph	Aug 15	Oct 31	foliage to bark	decline	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
nymph, adult	Apr 20 - Apr 30	96 - 137	plants bloom: boxelder, star magnolia, periwinkle, Norway maple
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acephate Acephate 97 WDG C 24 hours

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^for agricultural applications only.

LARGE HICKORY LECANIUM

Eulecanium caryae

Page 364 (Johnson & Lyon)

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

Comments

Signal Word

Agricultural Restricted Entry Interval (REI)^

	Lepitect	Effective against immatures. Bee caution.	C	24 hours
	Orthene T,T & O WSP	BEE CAUTION	C	24 hours
acetamiprid	TriStar 8.5 SL	BEE CAUTION	C	12 hours
*bifenthrin	Talstar P Professional	Effective against immatures. Bee caution.	C	12 hours
carbaryl	Carbaryl 4L	Effective against immatures. Bee caution.	C	12 hours
	Sevin SL	BEE CAUTION	C	12 hours
*chlorpyrifos	Chlorpyrifos 4E AG	Non-residential, BEE CAUTION	W	24 hours
*clothianidin + bifenthrin	Aloft GC G	BEE CAUTION	C	12 hours
*clothianidin	Arena .25 G		C	12 hours
*deltamethrin	Suspend SC	Effective against immatures. Bee caution.	C	
*dinotefuran	Safari 20 SG	BEE CAUTION	C	12 hours
horticultural oil	Damoil		C	4 hours
	Sunspray Ultra-Fine Spray Oil		C	4 hours
*imidacloprid	Mallet 75 WSP	BEE CAUTION	C	12 hours
	Merit 75WSP	BEE CAUTION	C	12 hours
	Xytect 2F	BEE CAUTION	C	
insecticidal soap	Des-X Insecticidal Soap Concentrate		W	12 hours
	M-Pede	Only effective against immatures.	W	12 hours
lambda-cyhalothrin	Demand CS	Effective against immatures. Bee caution.	C	
*lambda-cyhalothrin	Scimitar GC	Effective against immatures. Bee caution.	C	24 hours
malathion	Malathion 5 EC	Effective against immatures. Bee caution.	W	12 hours
	Malathion 8 Flowable	Effective against immatures. Bee caution.	C	12 hours
pyriproxyfen	Distance IGR	Only effective against immatures.	C	12 hours
*thiamethoxam	Meridian 0.33G	BEE CAUTION	C	12 hours

Disease Management Guide

Disease Management Guide for Connecticut Arborists 2015-2016

*Prepared by
Dr. Sharon M. Douglas
Emeritus Plant Pathologist*

Department of Plant Pathology and Ecology
The Connecticut Agricultural Experiment Station
New Haven, CT



CAES

The Connecticut Agricultural Experiment Station
Putting Science to Work for Society since 1875



Quercus (Oak)

Disease ✓ (Pathogen/Cause)	Diagnostic Symptoms ✓	Management ✓	Materials ✓
Anthracnose (<i>Apiognomonia</i>)	Irregular, necrotic spots which are tan and papery in appearance develop on newly emerging leaves in wet weather; spots are often so numerous that they coalesce and leaves appear blighted; some leaf distortion also occurs when margins are infected; as leaves reach full size they become resistant; heavily infected leaves drop and defoliation can occur; twigs with overwintering infections may die; white oak is most susceptible;	<ul style="list-style-type: none">• rake and remove fallen leaves;• prune and remove infected twigs;• maintain vigor;• fungicide sprays are usually not practical or necessary except for new transplants, young or specimen trees, or when defoliation has been heavy for several years; fungicide sprays can be applied at budbreak and repeated 2-3 times at label intervals;	azoxystrobin chlorothalonil chlorothalonil + fenarimol copper salts of fatty acids copper sulphate pentahydrate mancozeb mancozeb + copper hydroxide thiophanate methyl thiophanate methyl + chlorothalonil

Disease Management Guide



FIND AN
ARBORIST

JOIN CTPA

The most important thing to remember is that the label instructions that you are following must be from the label that specifically belongs to the material you are using. The label is the law. Make sure you are using the right label!

Insecticides/Miticides

Trade Name	EPA	Reg. No.	Active Ingredient	Company
Arena	59639-157	Clothianidin	Valent	
label Avid 0.15 EC	100-896	Abamectin	Syngenta Crop Prod.	
label Avid 0.15 EC MSDS	Material Safety Data Sheet			
Conserve	62719-291	Spinosad	Dow Agrosciences	
Dipel Pro DF	73049-39	Bt, subs. Kurstaki	Valent Biosciences	
Floramite SC	400-508	Bifenazate	Chemtura USA	
Horticulture Oil	10404-66	Oils	Lesco	
Merit 75 WSP	432-1318	Imidacloprid	Bayer	
Orthene T,T & O	59639-26	Acephate	Valent USA	

The Class Website has a listing of common insecticides and miticides. You can use these to get yourself familiar with some of the more common chemicals used.

Categorizing Pesticides:

*learning about what they
have in common, and how
they differ*

Kinds of Pesticides

by use:

- insecticides
- fungicides
- miticides

Kinds of Pesticides by use: toxicity

Signal Word	Relative Toxicity (<i>to mammals</i>)
Danger	High
Warning	Moderate
Caution	Low
Caution	Relatively Non-Toxic

Chart of Signal Words – Core Manual

Kinds of Pesticides by chemistry:

- horticultural oils
- organophosphates
 - carbamates
- synthetic pyrethroids
 - neonicotinoids
- biorational insecticides

Kinds of Pesticides by mode of action:

- **systemic**
- **locally systemic**
 - **contact**
 - **residual**

Kinds of Pesticides

what they affect:

- broad spectrum
- narrow spectrum
- protectant / eradicant
- phytotoxicity

Kinds of Pesticides by how they're applied:

- foliar application (spray)
 - soil injection
 - trunk injection







Comparison of Common Arboriculture Insecticides (chart produced by ChatGPT)

Feature	Acelepryn (chlorantraniliprole)	Imidacloprid (neonicotinoid)	Carbaryl (Sevin; carbamate)	Pyrethroids (permethrin, bifenthrin, etc.)
IRAC Group	28 (ryanodine receptor modulator)	4A (nicotinic acetylcholine receptor agonist)	1A (acetylcholinesterase inhibitor)	3A (sodium channel modulator)
Main Uses in Trees	Caterpillars, leafminers, sawflies, some beetle larvae	Borers, adelgids, scales, leafminers (systemic)	Broad-spectrum chewing insects, defoliators	Defoliators, bark beetle sprays, general contact insects
Systemic Activity	Weak to moderate (some uptake in leaves, not strong in woody tissue)	Strong systemic, xylem-mobile	Not systemic	Not systemic
Residual Activity	Long (weeks to months, one app often enough)	Long (weeks to months in woody tissues)	Short to moderate (days to ~2 weeks)	Short (days to a few weeks)
Target Specificity	Selective for chewing insects; little impact on beneficials	Broad spectrum (many sucking pests controlled)	Very broad spectrum	Very broad spectrum
Signal Word	None (very low acute toxicity)	"Caution"	"Caution" or "Warning" depending on formulation	"Caution" or "Warning"
Pollinator Risk	Low when applied properly (not to blooms)	High risk—linked to bee declines if misused	Moderate–high (very toxic to bees)	Very toxic to bees if sprayed on flowers
Aquatic Toxicity	Low	Moderate–high	High	Very high (especially to fish and invertebrates)
Resistance Issues	Relatively new MOA, still effective	Resistance seen in many insect groups	Resistance documented in some pests	Resistance widespread in many pests
Arborist Appeal	Safety, long residual, caterpillar/sawfly control	Strong systemic for borers/adelgids	Cheap, fast knockdown, wide use	Fast knockdown, cheap, wide use

Further Sources of Information:

- The Core Manual

- If you work for a tree care company now, ask the person responsible for doing IPM

- Pesticide and Pesticide Applicator Sales

- Trade Shows

- Journal Articles

- Pirone's Tree Maintenance and other very good sources of information

To see a selected set of sample Pesticide Labels, visit the Course Webpage and scroll down to the section on Sample Pesticide Labels, or use the link below:

Sample Pesticide Labels

<https://ctpa.org/arboriculture101.html/#Labels>

Questions?

Sample label

using

Merit 75 WSP

as an example



MERIT[®]

75 WSP

INSECTICIDE

* *For foliar and systemic insect control in turfgrass (including sod farms), landscape ornamentals, fruit and nut trees, and interior plantscapes.*

ACTIVE INGREDIENT:

* Imidacloprid, 1-[(6-Chloro-3-pyridinyl)methyl]-N-nitro-2-imidazolidinimine75%

OTHER INGREDIENTS: 25%

Total: 100%



MERIT[®]

75 WSP

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EPA Reg. No. 432-1318

EPA Est. No.

**STOP - Read the label before use.
Keep out of reach of children.**

CAUTION

Merit 75 WSP

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**STOP - Read the label before use.
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CAUTION

Merit 75 WSP

FIRST AID

If swallowed

- Call a poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by a poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

If on skin or clothing

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15 to 20 minutes.
- Call a poison control center or doctor for treatment advice.

If in eyes

- Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

In case of emergency call toll free the Bayer Environmental Science Emergency Response Telephone No. 1-800-334-7577. Have a product container or label with you when calling a poison control center or doctor, or going for treatment.

Note To Physician: No specific antidote is available. Treat the patient symptomatically.

Merit 75 WSP

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Harmful if swallowed, inhaled, or absorbed through skin. Causes eye irritation. Avoid contact with skin, eyes, or clothing. Avoid breathing dust or vapor. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse. Keep children or pets off treated area until spray is dry.

Applicators and Other Handlers Must Wear:

- Long-sleeved shirt and long pants
- Chemical resistant gloves made of any waterproof material such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyethylene, polyvinylchloride (PVC) or viton.
- Shoes plus socks

Follow manufacturer's instructions for cleaning/ maintaining personal protective equipment, PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Merit 75 WSP

User Safety Recommendations

User should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Merit 75 WSP

ENVIRONMENTAL HAZARDS

This product is highly toxic to aquatic invertebrates. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area. This chemical demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Do not formulate this product into other end-use products.

Merit 75 WSP

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Merit 75 WSP

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

Pesticide Storage: Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area. Handle and open container in a manner as to prevent spillage. If the container is leaking, invert to prevent leakage. If container is leaking or material spilled for any reason or cause, carefully dam up spilled material to prevent runoff. Refer to Precautionary Statements on label for hazards associated with the handling of this material. Do not walk through spilled material. Absorb spilled material with absorbing type compounds and dispose of as directed for pesticides below. In spill or leak incidents, keep unauthorized people away. You may contact the Bayer Environmental Science Emergency Response Team for decontamination procedures or any other assistance that may be necessary. The Bayer Environmental Science Emergency Response Telephone No. is 1-800-334-7577 or contact Chemtrec at 800-424-9300.

Pesticide Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal: Completely empty container into application equipment. Then dispose of empty container in a sanitary landfill, by incineration or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

Merit 75 WSP

APPLICATION TO ORNAMENTALS

MERIT® 75 WSP Insecticide is for use on ornamentals in commercial and residential landscapes and interior plantscapes. MERIT® 75 WSP Insecticide is a systemic product and will be translocated upward into the plant system from root uptake. To assure optimum effectiveness, the product must be placed where the growing portion of the target plant can absorb the active ingredient. The addition of a nitrogen containing fertilizer, where applicable, into the solution may enhance the uptake of the active ingredient. Application can be made by foliar application or soil applications; including soil injection, drenches, and broadcast sprays. Foliar applications offer locally systemic activity against insect pests.

Merit 75 WSP

When making soil applications to plants with woody stems, systemic activity will be delayed until the active ingredient is translocated throughout the plant. In some cases, this translocation delay could take 60 days or longer. For this reason, applications should be made prior to anticipated pest infestation to achieve optimum levels of control. For outdoor ornamentals, **broadcast applications** cannot exceed a total of 8.6 oz (0.4 lb of active ingredient) per acre per year.

Merit 75 WSP

RECOMMENDED APPLICATIONS

For use only in and around industrial and commercial buildings and residential areas

CROP	PEST	DOSAGE MERIT® 75 WSP
Trees Shrubs Evergreens Flowers Foliage plants Groundcovers Interior plantscapes	Adelgids Aphids Japanese beetles Lace bugs Leaf beetles (including elm and viburnum leaf beetles) Leafhoppers (including glassy- winged sharpshooter)	Mealybugs Psyllids Sawfly larvae Thrips (suppression) Whiteflies
	Foliar Applications: Start treatments prior to establishment of high pest populations and reapply on an as needed basis.	
	White grub larvae (such as Japanese beetle larvae, Chafers, <i>Phyllophaga</i> spp. Asiatic garden beetle, Oriental beetle)	1.6 oz (1 packet) per 8,250 to 11,000 sq ft
	Broadcast Applications: Mix required amount of product in sufficient water to uniformly and accurately cover the area being treated. Do not use less than 2 gallons of water per 1000 sq ft. For optimum control, irrigate thoroughly to incorporate MERIT® 75 WSP Insecticide into the upper soil profile. Refer to use directions specific for FLOWERS and GROUNDCOVERS concerning additional use directions.	

Merit 75 WSP

RECOMMENDED APPLICATIONS
Trees, Shrubs, Flowers and Groundcovers

For use only in and around industrial and commercial buildings, and residential areas and state, national, and private wooded and forested areas to control the insect pests listed below:

Adelgids	Flatheaded borers (including bronze birch borer and alder borer)	Leafhoppers (including glassy-winged sharpshooter)	Sawfly larvae
Aphids	Japanese beetles	Leafminers	Soft scales
Armored scales (suppression)	Lace bugs	Mealybugs	Thrips (suppression)
Black vine weevil larvae	Leaf beetles (including elm and viburnum leaf beetles)	Pine tip moth larvae	White grub larvae
Eucalyptus longhorned borer		Psyllids	Whiteflies
		Royal palm bugs	

Trees	1.6 oz (1 packet) MERIT® 75 WSP per 24 to 48 inches of cumulative trunk diameter
-------	--

Soil Injection: GRID SYSTEM: Holes should be spaced on 2.5 foot centers, in a grid pattern, extending to the drip line of the tree. CIRCLE SYSTEM: Apply in holes evenly spaced in circles, (use more than one circle dependent upon the size of the tree) beneath the drip line of the tree extending in from that line. BASAL SYSTEM: Space injection holes evenly around the base of the tree trunk no more than 6 to 12 inches out from the base.

Mix required dosage in sufficient water to inject an equal amount of solution in each hole. Maintain a low pressure and use sufficient solution for distribution of the liquid into the treatment zone. For optimum control, keep the treated area moist for 7 to 10 days. Do not use less than 4 holes per tree.

No Soil Injection Applications Allowed in Nassau or Suffolk Counties of New York.

Soil Drench: Uniformly apply the dosage in no less than 10 gallons of water per 1000 square feet as a drench around the base of the tree, directed to the root zone. Remove plastic or any other barrier that will stop solution from reaching the root zone.

For Control of Specified Borers: Application to trees already heavily infested may not prevent the eventual loss of the trees due to existing pest damage and tree stress.

Merit 75 WSP

RECOMMENDED APPLICATIONS
For use only in and around residential areas

CROP	PEST	RATE PER APPLICATION	
Pome Fruits Apple Crabapple Loquat Mayhaw Pear Pear (oriental) Quince	Aphids (except Woolly apple aphid) Leafhoppers (including glassy-winged sharpshooter) Leafminer Mealybugs* San Jose Scale*	1.6 oz (1 packet) per 300 gal of water	2.1 oz per acre ¹

Apply specified dosage as foliar spray as needed after petal-fall is complete.

For control of rosy apple aphid, apply prior to leafrolling caused by the pest.

For first generation leafminer control, make first application as soon as petal-fall is complete. Greatest leafminer control will result from the earliest possible application. For second and succeeding generations of leafminer, optimal control is obtained from applications made early in the adult flight against egg and early instar larvae. A second application may be required 10 days later if severe pressure continues or if generations are overlapping. A single application may result in suppression only. MERIT® 75 WSP will not control late stage larvae.

For San Jose Scale, time applications to the crawler stage. Treat each generation.

For late season (preharvest) control of leafhopper species, apply MERIT® 75 WSP while most leafhoppers are in the nymphal stage.

For optimal control of mealybug, insure good spray coverage of the trunk and scaffolding limbs or other resting sites of the mealybug.

Do not apply more than 2.1 ounces per acre in a single application. Do not make more than 5 applications.

Allow 10 or more days between applications. Allow at least 7 days between last application and harvest.

*Not for use in California for control on pears.

Merit 75 WSP

RESTRICTIONS

Do not graze treated areas or use clippings from treated areas for feed or forage. Avoid runoff or puddling of irrigation water following application. Keep children and pets off treated area until dry. Avoid application of MERIT® 75 WSP Insecticide to areas which are water logged or saturated, or frozen, which will not allow penetration into the root zone of the plant. Do not apply more than 8.6 oz (0.4 lb of active ingredient) per acre per year.

Treated areas may be replanted with any crop specified on an imidacloprid label, or with any crop for which a tolerance exists for the active ingredient.

For crops not listed on an imidacloprid label, or for crops for which no tolerances for the active ingredient have been established, a 12-month plant-back interval should be observed.

Merit 75 WSP

IMPORTANT: READ BEFORE USE

Read the entire Directions for Use, Conditions, Disclaimer of Warranties and Limitations of liability before using this product.

If terms are not acceptable, return the unopened product container at once. By using this product, user or buyer accepts the following conditions, disclaimer of warranties and limitations of liability.

CONDITIONS: The directions for use of this product are believed to be adequate and should be followed carefully. However, because of manner of use and other factors beyond Bayer Environmental Science's control it is impossible for Bayer Environmental Science to eliminate all risks associated with the use of this product. As a result, crop injury or ineffectiveness is always possible. All such risks shall be assumed by the user or buyer.

Merit 75 WSP

Sources of Information:

- **State Coop Extension Services**
 - **Cornell (NY State)**
 - **UMass**
- **Books (esp. Cornell books)**
 - **Pesticide Suppliers**

Final:

Thoughts?

Comments?

Questions?