



# Hort Notes<sup>®</sup>

An educational newsletter with research-based information for businesses and individuals involved in selling, planning, designing, servicing, and enjoying landscapes and gardens.

## How Strong Are Those J-Lags You're Using?

*Brian Kane, Mass. Arborists Association Prof. of Commercial Arboriculture, University of Massachusetts Amherst*

Many arborists use J-lags (or 'lag screws' or just, 'lags') to attach cables to trees. In some cases, it's not appropriate to use lags when you're installing a cable. If the branch in which you want to anchor the cable has decay, is greater than 8" diameter, or has inherently soft wood (such as conifers, willows, poplars), eyebolts *shall* be used to anchor a cable to the branch. In other situations, lags are ok to use, according to the ANSI A300 Standard for Support System Installation.

One concern with lags is the perception that they will more easily pull out of the branch you're trying to cable, making them less secure than eyebolts. The holding strength of a lag in wood is determined by three factors: diameter of the lag, length of thread on the lag, and density of the wood. These rules hold for lags that have been installed in timber (such as during house construction), and timber engineers have tested and re-tested them, to make sure they're accurate. Of the three factors, the most important is wood density, which is why lags shouldn't be used on trees with "soft" wood, or wood of very low density. For comparison, red oak is 1¾ times denser than white pine, which means, in theory, it's 2¼ times harder to pull the same lag from a red oak than a white pine.

Unfortunately, there's not very much information on the holding strength of lags in trees. One very old publication described how much force it took to extract lags of different diameters from several species, but there's not much else. Much of what we know about holding strength of lags comes from that publication and our collective experience of installing lags for cables.

We wanted to look into this a little more, so we installed 1/4" and 3/8" lags into sugar maples and paper birches

in the woods near the UMass campus. We also installed lags in red oaks growing in Virginia. Each of the last four years, we've cut down some of those trees and measured the force it took to pull the lags out. We tested 100 lags, and did not pull a single one out of the tree. For all but a handful of lags, the "j" of the lag simply straightened, without pulling the lag out of the wood. A few lags broke at the point where the shank of the lag met the wood of the tree. It took 900 lbs. of force to straighten 1/4" lags and 1,850 lbs. of force to straighten 3/8" lags. The number of years that the lags had been installed did not affect the force it took to pull the lags out, with one exception. On several trees of both species, we installed lags and then immediately tried to pull them out. It took less force to pull those lags out than the lags that had been installed for one, two, three, or four years. We think this difference was due to the "lip" of callus wood that formed around the tip of lags that had been installed for one to four years.

To simulate trees with decay, we installed 1/4" and 3/8" lags in both species to varying thread depths (1/2", 1", 1½"). We were able to pull out all of these lags (70 total) and the force for pulling them out was roughly proportional to the length of thread, density of wood, and diameter of the lag. However, the force was only 60% of that predicted by the equation used for lag strength in timber. This shows the inherent variability of trees, and reminds us that formulas used for timber and beams may not accurately reflect what happens in a tree. When we installed 1/4" lags to 75% of their thread length, they pulled out at 750 lbs. of force, which was 84% of their strength when installed fully. When we installed 3/8" lags to 75% of their thread length, they pulled out at 1,375 lbs. of force, which was 76% of their strength when installed

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fully. This illustrates how quickly lags lose their holding capacity if there's even just a little decay in the branch or trunk.

Speaking of decay, we visually measured the amount of discoloration associated with lags we installed, and it was rarely more than the area needed to drill a hole in the tree. Paper birch and sugar maple are known as pretty good compartmentalizers, so it's not fair to apply our results to other species, but even after four years, there was very little discoloration and no obvious decay associated with lag installation.

If you're annually inspecting cables that you or others installed, you should check for evidence of advanced

decay, because that can significantly weaken lags. You should also check to make sure that the cable is still installed at the correct height (2/3 the distance from the attachment the cable is meant to support to the top of the tree).

We need to do more work on lag strength values, as well as some tests to see whether it's more cost effective to use lags or eyebolts. It would also be helpful to get better measurements on what the forces in the cable are when the wind is blowing. That's a hard measurement to make, but it is very important to know whether the lag you installed will fail during a storm.

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## Weed Identification Resources: Part 1 - Books

*Randy Prostak, Weed Specialist, UMass Extension Landscape, Nursery and Urban Forestry Program*

"What are the best books for weed identification?" is one of the most common questions that I am asked. Since correct weed identification is the first step in the development of a weed management program, I am pleased by this request because I know that those who seek this information will be able to develop stronger and more effective weed management programs for the sites they manage.

The most important thing one can learn about a specific weed is its life cycle. Correct identification is the easiest and most reliable method to determine whether a weed is a annual (summer or winter), biennial, or perennial (simple/solitary or creeping/spreading). Knowing a weeds life cycle is valuable because not all management strategies are appropriate for all life cycles.

Below is a list of books that can help you enhance your weed identification skills. Where appropriate, I have added comments about the publication.

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### **WEED BOOKS**

**Weeds of the Northeast** by Richard H. Uva, Joseph C. Neal and Joseph M. DiTomaso - Comprehensive book for the northeastern US, complete with easy to use ID key, shortcut identification tables based on certain unusual vegetative characteristics and comparison tables for similar weeds, word and picture glossary, great photography.

**Common Weeds of the United States** by the USDA-ARS - Detailed descriptions and great line drawings, US distribution maps, word and picture glossary, no ID key, an oldie but goodie.

**Grasses - An Identification Guide** by Lauren Brown - Great book of grasses of New England, simple key based on the shape of the inflorescence, I highly recommend this one.

**Some Grasses of the Northeast - A Key to Their Identification by Vegetative Characters** by C.E. Phillips High quality vegetative key with great illustrations of the collar regions of grasses, download at [ftp://ftp-fc.sc.egov.usda.gov/VT/Technical/Grazing/Grasses\\_of\\_the\\_Northeast.pdf](ftp://ftp-fc.sc.egov.usda.gov/VT/Technical/Grazing/Grasses_of_the_Northeast.pdf)

**Weeds of the Northeast - Aids to Identification by Basal-leaf Characteristics** by C.E. Phillips and V. J Fisher - A classic, great illustrations on basal leaves, available at [amazon.com](http://amazon.com).

**Wild Urban Plants of the Northeast: A Field Guide** by Peter Del Tredici - Available this spring, a unique look at weeds of urban areas.

**Weeds of the North Central States** prepared by University of Illinois at Urbana-Champaign - Divided key based on flower color, detailed descriptions with

line drawings, north central US distribution maps, great agronomic weed seedling key, also available online at [www.aces.uiuc.edu/vista/html\\_pubs/WEEDS/list.html](http://www.aces.uiuc.edu/vista/html_pubs/WEEDS/list.html)

**Weeds of the Northern US and Canada** by France Royer and Richard Dickinson – Keyed by leaf arrangement and flower color, photo keys for weed seedlings and grasses, common names in both English and French, great photography.

**Ontario Weeds** by J.F. Alex and C. M. Switzer – Very detailed descriptions and good line drawings, vegetative key, also available online with photos at [www.omafra.gov.on.ca/english/crops/facts/ontweeds/weedgal.htm](http://www.omafra.gov.on.ca/english/crops/facts/ontweeds/weedgal.htm)

**Weeds** by W. C Muenscher – A true classic that was first published in 1935, might be hard to find but if weed books excite you, this is one worth finding.

### **WILDFLOWER BOOKS**

**Newcomb's Wildflower Guide** by Lawrence Newcomb and illustrated by Gordon Morrison – The best weed ID book there is (my opinion, of course), unique and very effective key that requires a little training. I suggest you practice on weeds or wildflowers that you know to get the hang of using the key. Line drawings have great detail, one of my three “must carry” when I am in the field botanizing.

**A Field Guide to Wildflowers: Northeastern/Northern North America** by Roger Tory Peterson and Margaret McKenny, one of many in the Peterson Field Guide series - No key provided, book divided by flower color and to lesser extent within color by other flower and leaf characteristics, descriptions short and concise, a very helpful feature is that unique characteristic(s) is (are) in italics and an arrow points to that characteristic in the line drawing of the species, one of my three “must carry” when I am in the field botanizing.

**Wildflowers in the Field and Forest** by Steven Clemants and Carol Gracie – Simple yet very effective key where flower color is further divided into leaf arrangement and sometimes petal count, great photography, northeast US distribution maps, one of my three “must carry” when I am in the field botanizing.

**Wildflowers of the Berkshire and Taconic Hills** by Joseph G Strauch, Jr.

**New England Wildflowers** by Frank Kaczmarek.

**Wildflowers of the Eastern United States** by Wilbur H. Duncan and Marion B. Duncan.

## **Weed Management for Garden Retailers**

**Date:** APRIL 1

**Time:** 8:30 am - 12:30 pm

**Place:** Doubletree Hotel, Milford, MA

The University of Massachusetts Extension Agriculture and Landscape Program offers training for garden center employees, horticulture retailers and others interested in helping their customers with questions about weed management products.

Customers commonly ask garden retailers questions about weed identification and the control of weeds in lawns, landscapes and gardens. This program with UMass Extension Specialist Randy Prostack will help retailers answer many of these common questions. Some of the questions to be discussed include:

- “What can I use to control weeds if I don't want to use pesticides or herbicides?”
- “Will corn gluten meal control crabgrass effectively?”
- “What time of year should I spray my weeds?”
- “If I seed my lawn in the spring, how do I stop crabgrass from taking over?”
- “What is the best way to control bitter-sweet, poison ivy and brush?”
- “How do I get rid of Japanese knotweed?”

A wide range of weed control strategies and retail products will be discussed in-depth. Tips and resources for weed identification will be covered. There will be plenty of time for questions and discussion on topics that are important to the participants - bring your questions!

**4 pesticide recertification credits** available for categories 29, 36, 37, and Applicator's License.

**For more details and a registration form**, go to [www.umassgreeninfo.org](http://www.umassgreeninfo.org)

**Questions?** Contact Ellen Weeks at (413) 545-0895 or [eweeks@umext.umass.edu](mailto:eweeks@umext.umass.edu)

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**Wildflowers of Massachusetts, Connecticut and Rhode Island – In Color** by William K Chapman, Valerie Conley Chapman, Alan E. Bessette and Arleen Rainis Bessette.

**Illinois Wildflower** by Don Kurz – Awesome photography, many species occur in New England.

**FLORAS OF A REGION** – for the individual who is serious about identifying local flora.

**Herbaceous Plants of Maryland** by Melvin L. Brown and Russell G. Brown – Introduced to me 19 years ago by Dr. John Meade, Rutgers University and has become one of my all time favorites, good fit because terrain (coastal to mountainous) and hardiness zones (4 to 7) of Maryland are similar to Massachusetts and New England.

**Manual of Vascular Plants of Northeastern United States and Adjacent Canada** by Henry A. Gleason and Arthur Cronquist – I consider this the book for flora of New England, consider purchasing **Illustrated Companion to Gleason and Cronquist's Manual – Illustrations of the Vascular Plants of Northeast United States and Adjacent Canada** by Noel H. Holmgren. Best if used together, not inexpensive.

**The Plants of Pennsylvania** by Ann Fowler Rhoads and Timothy A. Block – Published in 2007 and has become one of my favorites, keys for families and genera easy to use.

**Flora of West Virginia** by P. D. Strausbaugh and Earl L. Core.

## Weed Identification Workshops

Correct weed identification is an important first step in the development of an effective weed management program. Using a classroom presentation, potted weed herbarium and weed walk, UMass Extension Specialist Randy Prostak will help participants enhance their weed identification skills. Feel free to bring a weed or two to identify.  
9 am - 3 pm.

**Broadleaf Weeds** (plus a few grassy weeds)  
JUNE 22 - Arnold Arboretum, Jamaica Plain  
JUNE 25 - UMass Amherst

**Grassy Weeds:** an in-depth look  
AUGUST 24 - UMass Amherst

**5 pesticide recertification credits** available for categories 29, 36, 37, and Applicator's License.

**For more details and a registration form,** go to [www.umassgreeninfo.org](http://www.umassgreeninfo.org) or call (413) 545-0895.

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