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# Weed Identification 101: Knowing nursery weeds by their names is key to control

I received most of my weed science education from Auburn University in Alabama, where the spectrum of weed species is very different from that in Oregon. Upon arriving here, I had a steep learning curve, as I tried to learn the weed species in this area in order to be the "expert" I was hired to be. Along the way, I learned some important concepts in identifying weed species that I would like to share in this article.

## Importance of identification

Poor weed identification can cause problems with your weed management program. Many herbicides are specific for certain types of weeds. For example, yellow nutsedge (*Cyperus esculentus*, family Cyperaceae) is commonly misidentified as a grass (family Poaceae), and



often erroneously treated with herbicides that specifically target plants in the grass family. Use of grass-active herbicides to control yellow nutsedge will result in complete control failure. Furthermore, there is only a narrow selection of herbicides, both pre- and post-emergence, that will provide control of yellow nutsedge. Proper weed identification is often the first step to effective weed control.

Weed identification is also important with respect to timing of herbicide applications. I've been asked many times to offer advice on which particular herbicide is most effective in controlling a specific weed outbreak. Many times the weed in question is a short-lived summer or winter annual. For example, a common mistake I have observed in many farms is misidentification of wild garlic (*Allium vineale*) with the closely related wild onion (*A. canadense*). Both weeds are in the same family and genus; however, control recommendations for wild garlic are dramatically different. Proper timing of herbicide application is crucial for controlling wild garlic. Mistakes will be made in application timing if weeds are not properly identified.

I have said many times that understanding weed biology, particularly



LEFT Sepal number and characteristics are often over-looked but are extremely useful in identifying plants (*Veronica persica*).

Right: Leaf size and shape often vary, but some characteristics such as perforations, seen in this *Hypericum perforatum*, are consistent and useful identifying characteristics.



reproductive biology, is paramount for developing an effective weed management program. For many of the most troublesome weed species, timing herbicide applications to preempt some reproductive stage is critical. For example, seed release of the native (and often weedy) cottonwood (*Populus trichocarpa*) occurs over a very narrow window of time. Proper weed identification is the first step to understanding reproductive biology and developing an effective weed management program.

### How to identify weeds

How do you identify weeds? Be honest. Do you use the dichotomous keys provided in taxonomy texts? Or do you take your copy of *Weeds of the West* off the bookshelf and page through it until you find a photo that looks fairly close to the weed you have in hand? I don't like using taxonomic keys, but I do recommend using an approach that is a little more rigorous than thumbing through a weed photo album. Note that identification of weeds in container crops is slightly different from field crops.

### Weeds in nursery containers

There is a short list of weeds that infest nursery containers. Of all the weeds I've seen at nurseries throughout Oregon, more than 99 percent are one of the eight species discussed in

a previous *Digger* article on container weed identification (September 2004). Those species include: liverwort (*Marchantia polymorpha*), bittercress (*Cardamine oligosperma*), creeping woodsorrel (*Oxalis corniculata*), common groundsel (*Senecio vulgaris*), northern willowherb (*Epilobium ciliatum*), annual bluegrass (*Poa annua*), prostrate spurge (*Chamaesyce maculata*) and pearlwort (*Sagina procumbens*). Another resource for viewing Oregon container weeds is my Web site listed at the end of this article. In addition to these eight species, I have noticed an increased incidence of annual sowthistle (*Sonchus oleraceae*) in Oregon nursery containers.

There are only a few weed species that infest containers, and each of those is morphologically distinct. Remember the distinguishing characteristics of each species or carry a pictorial guide with you in the nursery, and take notes of which species are prevalent.

### Weeds in field crops

There are many weed species in field crops of the Willamette Valley. Weed species vary by soil type, field location and, most importantly, by cropping history of the particular field. I would guess conservatively that there are 40 to 60 economically important weed species prevalent in field soils around the Willamette Valley. There are enough potential weed species to justify a more systematic approach to weed identification than merely thumbing through a photo book.

There are three things you should consider in taking a more systematic approach to weed identification. First,

expand your vocabulary and understanding of the common morphological characteristics of plants. Do you remember all the parts of a flower? Can you distinguish the sepals from the petals of a flower? Can you separate the male from female reproductive structures on a flower? If your answer is no to any of those questions, take time to refresh your familiarity with plant anatomy.

Second, familiarize yourself with the plant families to which most Oregon weed species belong (Table 1). Plants in the same family have many common characteristics that can be used for identification. For example, plants in the family Portulacaceae always have two sepals and five petals. This combination of easily identified characteristics will rapidly

narrow the realm of possibilities for weed identification. Plants in the same family also respond similarly to herbicides. For example, plants in the families Fabaceae and Asteraceae are very susceptible to the herbicide clopyralid (Lontrel or Stinger).

Third, catalog the weeds in your nursery with a digital camera. Record your own set of digital images and make training materials for others in the nursery. This exercise will be more effective in forcing you to organize your thoughts and ideas than will simply trying to learn the weeds by observation and memorization. You'll find that your understanding and comprehension of weed identification is far greater after you've learned it well enough to teach someone else.



ABOVE Petal number, stamen number and even style number are clear and distinct characteristics that are very useful in identification (*Oxalis corniculata*).

RIGHT Pubescence type (there are many) is a very distinguishing characteristic among plant species, such as stellate pubescence on this *Arabidopsis thaliana*.

**Table 1.**  
Twelve plant families to which many Oregon weed species belong.

Plant family	Common name	Representative species
Apiaceae	Carrot	Wild carrot, poison hemlock, cow parsnip
Asteraceae	Sunflower	Common groundsel, thistles, dandelion
Brassicaceae	Mustard	Bittercress, shepherds purse, wild mustard
Caryophyllaceae	Pink	Common chickweed, pearlwort
Convolvulaceae	Morning glory	Field bindweed, hedge bindweed
Geraniaceae	Geranium	Wild geranium, redstem filaree
Plantaginaceae	Plantain	Broadleaf plantain, buckhorn plantain
Poaceae	Grass	Annual bluegrass, barnyard grass, crabgrass
Polygonaceae	Buckwheat	Broadleaf dock, red sorrel
Portulacaceae	Purslane	Common purslane
Scrophulariaceae	Figwort	Speedwell
Solanaceae	Nightshade	Nightshade

## Computer software

The most straightforward and simple approach to weed identification is the use of a program by XID Services Inc. ([www.xidservices.com/](http://www.xidservices.com/)). Along with Dr. Richard Old, XID Services developed a computer program that allows the user to identify weeds and other plants by simply inputting one or more plant characteristics. The program is a user-friendly database that contains thorough details of 600 to 3,000 weed species (depending on the version you purchase).

The XID software allows the user to input any number of plant physical characteristics, which in turn narrows the list of possible plant matches. For example, telling the computer that the weed in question has pink flowers narrows the list of possibilities from 512 to just 127 species. Further adding that the flowers of the weed in question contain two sepals narrows the list to just seven species. Photos and descriptions of the remaining seven possibilities are provided. A quick survey of the possibilities reveals the name of the weed in question.

A vast array of plant characteristics pertaining to its flowers, stems, leaves and roots can be entered into the computer to narrow the possible list of weeds into a manageable list. I input only those characteristics of which I am certain. Counting the number of petals or sepals, describing flower color or describing the pubescence on the foliage are very discrete plant characteristics that allow me to narrow a list of potential species from several hundred to just 10 or less. From that list the software provides digital images of the species so that a potential match can be made. Using Internet searches for additional photos, I further verify the identity of the weed in question. I used this approach to identify many weed species in the Willamette Valley.

It's best to avoid using variable

## *"It's best to avoid using variable or objective plant characteristics such as plant size or leaf shape."*

or objective plant characteristics. For example, plant size is a poor characteristic to use, considering that the weed in question may have been mowed, grazed or otherwise adversely affected by the environment. Characteristics such as leaf size and even leaf shape can vary, depending on climate and growing conditions. These are often variable, and ultimately less useful, characteristics and should be avoided when identifying plants.

This software can be purchased containing a number of different plant databases. One database contains more than 1,000 weeds throughout North America. Identical software can be purchased containing a database of the flora of Oregon or the Pacific Northwest (3,076 species). I prefer to use the database of Northwest weeds that describes 600 species in our region

of the U.S. The XID Web site offers databases for many different states and regions of the U.S. and Canada.

## Final thoughts

There is still one more foolproof way to identify weeds: Ask someone smarter than you. I do this often. Dr. Richard Halse runs the herbarium on the OSU campus. Part of the mission for the herbarium is to assist residents of Oregon with plant identification (including weeds). Simply deliver a plant in decent health to the herbarium, and they will contact you with its proper identification. Weeds can be pressed prior to delivery, or they can be delivered as live samples growing in a pot or hag. Provide the herbarium with as large a sample as possible, and give them a sample with flowers or fruits, if possible. Weeds that were left sitting on your dashboard for two weeks in July are much less likely to be identified properly.

I had a weed science professor who once told me: "Kill the weed first; identify it later." Based on what I've observed over the past couple of years, that may not be the best nugget of information I've received in my education. I've seen many weed-management mistakes made because of improper weed identification. Knowing the spectrum of weeds in your nursery prior to developing a weed-management program is prudent.

**Disclaimer:** This article is for educational purposes only. Mention of a specific product should not be interpreted as an endorsement, nor should failure to mention a product be considered a criticism. Always read the product label prior to using any herbicide.

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