Traits That Make Three Weeds Invasive
Clare Liptak, Retired Somerset County Agricultural Agent

Weed scientists, Barbara Booth, Stephen Murphy and Clarence Swanton, list a number of traits shared by many invasive weeds in their book, the second reference listed below. While the list is only a guideline to invasive potential, three invasive New Jersey weeds have several of these characteristics.

Dandelion (Taraxacum officinale) and curly dock (Rumex crispus) were brought to North America by Europeans; buckhorn plantain (Plantago lanceolata) came to this continent with Eurasian settlers, but it is grown in Europe as a medicinal plant and as fodder for livestock.

Curly dock and buckhorn plantain are wind pollinated but the latter can also be pollinated by hoverflies. Dandelion produces seed asexually without pollination or fertilization.

All three germinate in a wide range of environmental conditions, and dock seeds can still be viable after being buried for 80 years. Germination of dock seed is stimulated by red light and inhibited by far-red light or darkness. However scarification increases the germination rate even in a dark environment. Buckhorn plantain also needs light to germinate, but a small percentage of seed will germinate in the dark.

All three plants have seed that is adapted to short-distance and long-distance dispersal. Dandelion seed is wind dispersed; curly dock is transported by wind and water. All three weeds are a contaminant of seed mixes: dandelion is found in poorer quality Kentucky bluegrass seed mixes, and curly dock and buckhorn plantain in seed mixes of grasses, clover and alfalfa.

All three have the rosette pattern of growth, giving the plants a competitive advantage relative to other species. When trying to remove the weed, one usually tears off only the leaves, with the crown and taproot still in place. The rosettes of curly dock are even a bit below the soil surface giving it some protection from cold temperatures and damage due to wear.

Buckhorn plantain has fibrous roots, while dandelion and curly dock have taproots full of stored carbohydrates. If the crown of these last two weeds is damaged, shoots will develop from the taproot.

Finally, dock and dandelion are adapted for short-distance dispersal by transport of segments of these taproots. Buckhorn plantain is also adapted for short-distance dispersal by a different means. When the seed is wet, a sticky substance envelops the seed causing it to adhere to...
clothing, and fur. It's also present in soil on machinery.

References:

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Dandelion, one of our most ubiquitous weeds, is a problem in lawns and in many other crops. In tree fruits it lures bees away from the fruit blossoms. The seed head is quite symmetrical and beautiful. However, the parachute attached to the seed carries it far and wide. A perennial with a large taproot, its leaves are considered a delicacy by some folks both for salad greens and also for boiled greens. Each plant can be removed by use of a dandelion knife but it must go deep into the ground to remove all of the crown buds.

Buckhorn Plantain is listed as a perennial but seems to act as an annual in our area. The leaves are close to the ground but the flower stalk becomes quite long. It could slip between the blade and bed of the old reel mowers but the rotary mowers cut it off before it flowers and sets seed so it has become less of a problem in lawn areas.

Photos by Dr. John Meade, weed scientist emeritus, Rutgers NJAES Cooperative Extension

For more information and images of weeds go to New Jersey Weed Gallery at: http://www.njaes.rutgers.edu/weeds

Plant Diagnostic Laboratory Highlights
Richard J Buckley, Laboratory Coordinator

Turfgrass – all golf turf, all the time!
Just in time for summer, numerous samples of bentgrass and annual bluegrass from golf courses in the region are starting to roll into the laboratory. Many of the recent submissions were found to be disease-free and were simply suffering from the rigors of constantly changing weather conditions. One week we have exceptional evapotranspiration demand, then seasonal heat and humidity, and then cool and rainy weather. All in all, it makes for a difficult growing year.

At this point, we are in summer disease mode. Summer patch is the disease of the week. Samples of summer patch have been submitted to the laboratory from golf courses in New Jersey, New York, and Pennsylvania. We are also having fun with all the anthracnose samples. Interestingly enough, some of the yellow Poa coming in disguised as anthracnose, might really be annual bluegrass weevil damage. Most of these plugs do not have weevils present (so I can't accurately diagnose them), but many of them have very suspect symptoms. There are loads of adult weevils on the plots at our turf farm and we even got a wad of duct tape as a sample (excellent monitoring tool!) that was covered with adult beetles, so beware of the dreaded hyperodes.

Lastly, due to the relatively dry spring, we haven't seen much pythium root rot/dysfunction in the lab. With summer-like conditions that include heavier rains and some local flooding, that is starting to change. In fact, we even had a couple cases of outright Pythium blight during the last heat wave. Pythium root diseases, however, are most common in super-saturated soils. Pathologists often make a distinction between pythium root dysfunction and pythium root rot. Root rot is a disease of poorly drained (native) soil types that is caused by a myriad of pythium species. Root dysfunction is a disease of sand-based root zones and is caused by a couple of Pythium species. The most noted pathogen associated with root dysfunction is Pythium volutum. Most of the samples we see in our laboratory are root rot, not root dysfunction caused by P. volutum. And with root rot, there are almost always underlying issues with compaction, drainage, layering, poor physical structure, thatch, excess rainfall or irrigation, pocketed sites, and/or shade associated with the samples. In most of these cases, the site conditions alone will cause
the turf to yellow and thin. So no matter how often and how much product you drench into the root zone, the turf will probably not perform well until the site conditions are mitigated. Fungicide intervention is all well and good, but a smart turf manager will take a pythium root rot diagnosis with a grain of salt and look to the underlying stresses to fix the problem.

**Ornamentals need love too!**

Downy mildew of impatiens was officially diagnosed in the Rutgers Plant Diagnostic Laboratory for the first time this week. This disease, which is caused by the fungus *Plasmopara obducens*, is all-the buzz with the landscape, greenhouse, and nursery crew at this time because of its destructive potential. Impatiens downy mildew is first evident on new growth as curled, yellow leaves. As the disease progresses, white mycelial growth (downy fuzz) becomes evident on the undersides of the leaves. Rapid defoliation and plant death soon follows.

Impatiens play an important role in New Jersey landscapes as mass plantings in shady sites. Unfortunately, what beautifies the site also creates the perfect storm of conditions for the disease. High relative humidity and cool temperatures favor pathogen activity. Furthermore, the fungus spreads rapidly in overcrowded plantings through airborne spores that are easily dislodged and moved by splashing overhead irrigation and rain.

There is not much to do once the plants are infected. Rapid detection and excellent sanitation practices are essential to stop the spread of the disease. Remove and destroy the affected plant material. Do not turn the dead plants into the soil. In fact, it would be prudent to carefully bag up the diseased plants and send them to a landfill. Professionals can follow quickly with protective fungicide treatments. Be aware that these treatments can be expensive and do not provide much curative control. Fungicides are best used as preventive treatments. The following materials are labeled for downy mildew control in impatiens for commercial applicators only: Adorn (fluopicolide), Aliette (fosetyl-al), Heritage (azoxystrobin), Pageant (pyraclostrobin+boscalind), Protect (mancozeb), Segway (cyazofamid), Stature (dimethomorph), Subdue Maxx (mefenoxam), and Vital (potassium phosphite). Researchers at Cornell University suggest making applications on 14-day intervals. Be sure to pick a different product each time and to use the product in a manner that is consistent with the manufacturer's label specifications. I would also suggest that if you yank out downy mildew infected plants, it might not be too practical to replace them with more impatiens. I think it might be time to find something else for those shady sites!
Diseases of Turfgrass

Bruce B. Clarke, Ph.D., Turfgrass Pathology

General

Anthracnose, brown patch, dollar spot, copper spot, and slime mold are all prevalent on susceptible turf at this time. Red thread, which had been extremely active on landscape turf over the last month, has started to diminish due to the hot weather.

Brown Patch

Brown patch is apparent on landscape and golf course turf due to the recent hot, humid weather. To reduce the incidence and severity of brown patch, avoid applying too much nitrogen (e.g., not more than ¼ lb water soluble N/1000 sq. ft per week) during the summer months, irrigate between midnight and 8 AM rather than at dusk to minimize the leaf wetness period, and spray turf now with Banner (preventive only), Chipco 26GT, chlorothalonil, Compass, ConSyst, Disarm, Endorse, Headway, Heritage, Insignia, mancozeb, Medallion, ProStar, Spectro, Tartan, thiophanate-methyl, Tourney, Trinity, Triton, or Velista and repeat per manufacturer’s recommendations.

Summer Patch

Now is a good time to apply a second fungicide application for the prevention of summer patch on susceptible Kentucky bluegrass, annual bluegrass, and fine fescue turf that have had a history of this disease. The recent hot, wet weather has encouraged root infections, so summer patch should be severe again this year if July and August remain hot. For optimum protection, apply Banner, Bayleton, Compass, Disarm, Eagle, Headway, Heritage, Insignia, Rubigan, Tartan, thiophanate-methyl, Tourney, Trinity, or Triton in 4 to 5 gal of water/1000 sq ft. Repeat every three to four weeks (every two weeks if using thiophanate-methyl) through mid-August. If products containing thiophanate-methyl are delivered in lower water volumes (e.g., 2 gal water/1000 ft²), irrigate with 1/8 inch of water immediately following application to enhance disease control. The other penetrant fungicides (e.g., the DMIs and QoIs) are not as affected by water volume and therefore can be applied in 2 gal of water/1,000 sq. ft without the need for post-application irrigation. For best results, maintain soil pH at or slightly below 6.0, fertilize turf with ammonium sulfate (during cool weather to avoid phytotoxicity) or sulfur-coated urea, avoid the use of nitrate-based fertilizers (which can enhance symptom severity), and aerify (before symptoms develop) to reduce compaction and decrease disease severity.

Yellow Tuft

This disease, caused by the fungus Sclerophthora macrospora, has been present on greens and irrigated landscape turf for several weeks now. Yellow tuft (Downy Mildew) occurs on almost all cool-season turfgrasses; however, it is usually only a serious problem on turf maintained at a low cutting height. Poorly drained or heavily irrigated sites are often associated with enhanced disease development. Infected turf appears stunted, off color (yellow to light green), and may exhibit slightly broadened leaf blades and very apparent, dense clusters of shoots. Patches ranges in size from 0.25 to 1 inch in diameter for bentgrass and red fescue turfs, and 0.5 to 3 inches for Kentucky bluegrass and perennial ryegrass areas. Tufts are easily removed from the soil due to the absence of adventitious roots. To control this disease, improve drainage, avoid overwatering, mow only when the grass is dry, apply iron sulfate to mask symptom expression and spray turf with Chipco Signature, Insignia, Prodigy or Subdue MAXX now and on a preventive basis next year from late March to early June.

Turf Field Days

Mark your calendars now for this year’s Rutgers Turfgrass Research Field Days!

The Golf and Fine Turf Field Day will be held on Tuesday, July 31st at the Turf Research Facility on Hort Farm II, 102 Ryders Lane, North Brunswick NJ. Registration will begin at 7:30 am. An optional pesticide recertification core session will be given from 8 - 8:30 am and field tours will run from 9 am to 1 pm. Lunch will be provided from 1 - 2 pm. After the field day, Basic Training for the Professional Fertilizer Applicator Certification Exam will be presented at no charge from 2:00 - 3:00 pm for the first 80 registrants.

The Lawn, Landscape & Sports Turf Field Day and Trade Show will be held on Wednesday, August 1st at the Adelphia Plant Science Facility, 594 Halls Mill Road, Freehold NJ. Registration & Trade Show opens at 7:30 am and field tours and equipment demonstrations will run from 9 am – 1 pm. Lunch will be provided from 1 - 2 pm and an optional pesticide recertification core session will be given from 2-2:30 pm.

Pesticide recertification credits will be awarded for NJ, NY, CT, DE, MD and PA. To register on-line (or to print the registration form) and for additional information about the field days go to www.njturfgrass.org. The early registration discount for both field days ends on July 13th.
The Do’s and Don’ts of Irrigating Landscape Plants
Bert Cregg, Ph.D., Michigan State University Extension, Departments of Horticulture and Forestry

This article was published by Michigan State University Extension and posted on June 15, 2012 http://www.msue.msu.edu.

While most homeowners are diligent to water their flower beds and vegetable gardens, it is important to remember to give trees and shrubs a drink, too. Homeowners and landscapers should pay special attention to two groups of plants: trees and shrubs that were planted this spring or last fall and trees and shrubs that suffered late frost damage earlier this spring.

Irrigating newly planted trees and shrubs is important because these plants have not had a chance to become established and extend their roots into the surrounding soil. This is particularly true for container-grown plants, which are often watered daily at the nursery before being planted in the landscape. One of the common symptoms of damage by late frost this spring was leaf dieback or delayed bud break. These trees and shrubs are essentially “playing catch-up,” so it is critical to minimize any further stress to them as to try to rebound and rebuild leaf area.

Here are a few reminders in the form of “do’s and don’ts” to bear in mind as you irrigate the landscape.

**Do**

- Give good, long soakings rather than frequent, light watering. Some resources recommend more frequent watering, but once a week is a workable and realistic goal to shoot for. A typical rule of thumb is to provide at least 1 inch of irrigation per week. How many gallons of water this translates into depends on the size of the tree. If we measure the width of crown spread of a tree we can calculate the area under the drip line. We can then figure the volume of water needed to cover this area with 1 inch of water. I’ve done this in the table below and converted the volume to gallons. I’ve also calculated the length of time it would take to apply 1 inch of water, assuming a typical garden hose flow rate of 5 to 6.5 gallons per minute.

<table>
<thead>
<tr>
<th>Tree crown spread (ft)</th>
<th>Gallons</th>
<th>Minutes of watering*</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>20</td>
<td>3 - 4</td>
</tr>
<tr>
<td>8</td>
<td>30</td>
<td>5 - 6</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
<td>8 - 10</td>
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<td>70</td>
<td>11 - 14</td>
</tr>
<tr>
<td>16</td>
<td>125</td>
<td>20 - 25</td>
</tr>
<tr>
<td>20</td>
<td>200</td>
<td>30 - 40</td>
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</table>

*Assuming 5 to 6.5 gallons per minute from typical garden hose.

- Increase the irrigation amount as temperatures soar. The 1 inch per week is a good, rough guide, but peak evaporative demand can approach 2 inches per week during extremely hot, summer weather.

- Apply mulch properly. Mulching is the best way to conserve precious soil moisture in the landscape. Two to 3 inches of mulch is adequate. Research at Michigan State University and elsewhere suggests that the type of organic material used to mulch (e.g., wood chips, pine bark, hardwood bark) is less critical than the fact that plants are mulched.

**Don’t**

- Allow water to run-off. Water that runs off is wasted water. If you’re watering by hand and notice water running off, move from tree to tree to allow water to soak in before resuming watering.

- Ignore signs of drought stress in landscape plants. Wilting leaves, leaf scorch, dropping leaves and drooping leaders in conifers are your tree’s way of saying, “What’s a guy gotta do to get a drink around here?!”

- Water during hot, mid-day periods to reduce water loss to evaporation. Some experts argue against watering late in the evening due to possible disease problems associated with wet foliage. Morning is usually the best time to water.
Disease Control Recommendations for Ornamental Crops, 2012 Publication Available

The publication Disease Control Recommendations for Ornamental Crops by Ann Brooks Gould, Ph.D. is a comprehensive summary of pesticides currently labeled for ornamental disease control in New Jersey. The guide is used by industry professionals (arborists, growers of greenhouse crops, nursery crops, or Christmas trees, and personnel who manage various indoor and outdoor landscapes) for disease management of ornamental crops. This guide is not intended for use by homeowners. Publication E036, available at your County Extension Office or http://njaes.rutgers.edu/pubs/publication.asp?pid=E036.

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged much above normal, averaging 74 degrees north, 76 degrees central and 75 degrees south. Extremes were 99 degrees at Hammonton on the 22nd, and 46 degrees at Freehold on the 19th. Weekly rainfall averaged 0.31 inches north, 0.91 inches central, and .76 inches south. The heaviest 24 hour total reported was 1.68 inches at Toms River on the 22nd to 23rd. Estimated soil moisture, in percent of field capacity, this past week averaged 74 percent north, 71 percent central, and 65 percent south. Four inch soil temperatures averaged 71 degrees north, 72 degrees central and 71 degrees south.

<table>
<thead>
<tr>
<th>WEATHER STATIONS</th>
<th>R A I N F A L L</th>
<th>T E M P E R A T U R E</th>
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<tbody>
<tr>
<td></td>
<td>WEEK</td>
<td>TOTAL</td>
<td>DEP</td>
<td>MX</td>
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<tr>
<td>BELVIDERE BRIDGE</td>
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<tr>
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<tr>
<td>SEABROOK</td>
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<td>12.50</td>
<td>.60</td>
<td>86</td>
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SOUTH HARRISON missing
WES KLINE -- GDD BASE 40 PINNEY HOLLOW
LAST WEEK  199  (Ending 6/18/12)
THIS WEEK  251  (Ending 6/25/12)
TOTAL UNITS BASE 40 FOR FEBRUARY=55