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# Insectary?

By Cleve Campbell | April 2015 - Vol 1. No. 4

My wife recently commented that we could get help in the garden by planting an **insectary**. Insectary? Now that was a head scratcher. Naturally, I received the eyes rolling in the head look, when I meekly asked, "What's an insectary and why do we need one?" Now, I thought we were looking for help, but usually when I heard that dreaded phase, " We need to…" that's usually code for "**you** need to…" in short, **work**. Now what? After a moment of silence and a deep breath, my bride informed me that one form of an insectary is a type of garden or grouping of plants (**insectary plants)** that attracts and hosts bugs. Naturally I uttered a few inaudible words — "**WHAT? ATTRACT BUGS!** Have you lost your mind or what?"

Problem? What problem? Piece of cake — this insectary thing wasn't going to be a problem because I knew I was about to wake up from some sort of weird dream and this insectary thing would just go away. You guessed right; no such luck. "**We"** are going to have an insectary.

The more I thought about this upcoming insectary project, the more puzzled I became, because at our house we often refer to the vegetable garden as **"The War Zone"** — whether it's fighting the critters, the weather, too hot, too cold, too much rain, too little rain, fighting weeds, cold soil resulting in poor seed germination and that endless **war on bugs.** There comes a time when a fellow has to draw a line in the sand. Now with this **attracting bug project**, the moment for line-drawing may have arrived. Having not been on a good roll recently, I figured I needed to do a little insectary research before I made some profound political statement, resulting in another of my frequent trips to the doghouse.

Naturally over the years, I had observed various activities of bugs in the yard and garden. I have been bitten more than a few times by bugs dining on my blood, seen the holes eaten in green bean plants, eggplants and potato leaves by plant-eating bugs, observed small bee-like insects hovering around dill flowers, and delighted at the sight of a praying mantis stalking a bug on an asparagus fern. I have squashed more than a few unsuspecting bugs and egg masses between my thumb and forefinger on my daily patrols though the vegetable garden. Many of my gardening friends, myself included, share a similar perspective on

bugs: there are two types of bugs, **live ones and dead ones**, and the only good one is a dead one. And now with this insectary project we want to attract bugs. **Amazing!**

After spending a little time scratching my head, I went to the computer to do a little research on this insectary thing. Well, I was right about one thing; there are two (2) major categories of bugs: pests, the bad guys, and beneficial bugs, the good guys. And to my amazement, less than 1 percent of all insects are considered pests; however, an estimated one-fifth of the world's crops are destroyed by plant-eating or herbivorous insects. Remembering last season's bug-eaten cabbage, bean and eggplant leaves in my garden, it's obvious that my vegetable garden is doing more that its fair share to support the herbivorous insect population.

So doing the math, the remaining 99 percent of the insects are beneficial or considered neutral. The beneficial insects consist of three (3) kinds: predators, parasitoids and pollinators, a.k.a the 3 P's.

Predators eat other insects. Examples of predators include the Lady beetle (*Hippodamia convergens),* Assassin bug (*Redruviidaye),* Damsel Bug (Nabidae), Big-eyed bug (Lygaeidae) and Green lacewing larvae. Parasitoids are insects that lay eggs in or on other insects, resulting in the death of the host insect. Examples of parasitoids include the many wasps such as the Thichogramma wasp (*Trichogrammatidae).* Without pollinators, fruit, vegetables and the production of seeds would be greatly reduced. The best known pollinator is the honeybee, but our gardens also benefit from other native pollinators such as bumblebees and mason bees. In addition, adult parasitic insects such as small wasps feed on pollen and nectar and are also considered to be pollinators.

After pondering this good bug, bad bug revelation, I was stumped, it just didn't make sense. If the general population of bad bugs is less than one percent, why aren't the good guys winning the war in my garden? Why are there holes in my bean and eggplant leaves? After doing a little more research, I discovered that Mr. Darwin's concept of the survival of the fittest is still alive and well. Not only is it a war; it's an arms race. Unfortunately, the battlefield may have shifted in favor of the bad guys. In the 1940s the first modern synthetic insecticide, dichloro-diphenyl-trihorethane was introduced; you may have heard of this insecticide; some folks refer to it as DDT.


*DDT Poster: Source USDA*

Arms race? This is a very simplistic term for a very complex problem that developed over the past 70-80 years. DDT was hailed as a miracle. In fact, the developer, Paul Muller, received the Nobel Prize in 1938 for discovering the insecticide qualities of DDT. Shortly after World War II, DDT was adopted as the insecticide of choice for controlling pests on agricultural crops.

Now for the bad news. Shortly after DDT was introduced as an insecticide, a housefly in Sweden was discovered to be resistant to DDT. Farmers begin observing that DDT was becoming less effective for controlling pests; naturally the solution was "if some is good; more is better." Not only was the insecticide concentration increased, but the frequency of treatment was also increased, and the more DDT that was applied to crops, the less effect it had on the pest population.

What happened is that not all the insects were killed with the first application of DDT, so the survivors were genetically predisposed to be resistant to the insecticide and able to survive. Repeated applications and higher concentrations had little effect; the insecticide resistant insects continued to survive. So after a number of life cycles, the majority of the

pest population was unaffected by the insecticide. So how long does it take to develop a population of resistant insects? In some cases not long, because of the rapid reproductive rate of many insects. In some pests, a life cycle can take place in several weeks, meaning a number of generations can be produced in a single season or year.

So it becomes easy to see that repeated applications of an insecticide will eliminate all the non-resistant pests in the population, leaving only the resistant pests to survive. In a short period of time the entire population of insects will be resistant. Remember Darwin and his theory of survival of the fittest! (DDT was banned in this county in 1972 because of environmental threats to wildlife and potential human health issues.) Once we have resistant pest population the arms race begins, and the only solution is to develop new and improve insecticides, which only initiates the cycle again. This insecticide cycle is often referred to as the " pesticide treadmill" — once it starts, it repeats over and over and it is difficult to get off. It is estimated that more than 500 anthropoid species worldwide have developed a resistance to insecticides. (**Note**: the term Pesticides includes **herbicides** for destroying unwanted plants (weeds); **insecticides** for controlling insects; **fungicides** for controlling molds, mildews, and fungi and **compounds** to control small animals such as rats and mice).

Okay, what happens to the beneficial insect population when broad nonselective insecticides are applied? Well, they are killed by the insecticides, and unlike the targeted pests, in most cases, they are not as adaptive in developing resistance to the pesticides so their population decreases. It should be noted that available research and documentation on the effect of insecticides on beneficial insects appears to be very limited. Most of the research available is focused on how effective the insecticide is on the pest population.

Now I must admit, this revelation of resistant pests or **super bugs** is getting a bit scary and my bride's suggestion of an insectary may not be half bad!

After a little web surfing, it looks like this insectary project is going to be a breeze, it's just a matter of hitting the seed catalogs, looking at the pictures of the pretty flowers and ordering a few flower seeds and then, the old plant-it-and-they-will-come strategy. Then I heard that familiar voice: "Not so fast buster, just like the vegetable garden, we need to do a little planning. This is not going to be a 'Chocolate Box Ecology' project." I think that chocolate box was in reference to Forest Gump — where the line went something like "Life is like a box of chocolates; you never know what you are going to get." For what's it's worth, I wasn't about to challenge her strategy or ask for more infomation regarding her metaphoric statement.

It must have been a vision. I had this flash back to a book titled **The Art of War** written in the 6th century by a Chinese author, Sun Tzu. According to Mr. ,Tzu it is imperative to know your enemy before entering battle. And since my garden was a war zone, I need to identify and get to know the enemy. After pondering this revelation for a short period, I came up with a very simple four-pronged war plan:

1. Identify the bad insects, the pests
2. Identify the good insects, the guys that eat the bad guys.
3. Identify the Insectary plants that attract and host the good guys.
4. Select and plant insectary plants in and around the vegetable.

To successfully attract beneficial insects, a little planning is required. Plants need to be selected so there is secession of flower blooms throughout the growing season. Flowers provide a food source — pollen and nectar — to many beneficial insects; they do not dine only on aphid filets.

**Below** is my starter list of beneficial insects, their prey and plants that they like:

| Beneficial Insects | Pests | Plants |
|---|---|---|
| **Lacewings** | Aphids | Cilantro, Cosmos, Dill, Fennel, Queens Anne's Lace, Tansy and Yarrow |
| **Lady bugs** | Aphids | Buckwheat, butterfly weed, Cilantro, Dill, fennel Marigold, Queen Anne's Lace, Veronica Yarrow |
| **Hover Flies** | Aphids Mealybugs | Alyssum, Cilantro, Cosmos, Buckwheat, Lemon Balm, Parsley, Marigold, Thyme, Zinnia |
| **Parasite Wasps** | Moths, White Flies | Yarrow, Dill, Cilantro, Cosmos, Queen Anne's Lace, Lace Lemon Balm, Parsley, Sedum Marigold, Thyme, Zinnia |
| **Tachinid Flies** | Cabbage Lopper Cut Worms, Squash Bug Nymphs | Buckwheat, Lemon Balm, Parsley |

This is only a very brief starter list.  More comprehensive lists that include native plants and "garden" plants may be found at xerces.org, Virginia Native Plant Society Plant Lists, VCE Publication: ENTO-52 and permaculturenews.org. The size of an insectary may vary anywhere from a few insectary plants in flower pots to acres of insectary plants.

The VCE Publication: ENTO-52 suggested that **buckwheat** may be the ultimate insectary plant because it is insect-friendly by providing abundant and accessible nectar over a long bloom time; in addition, it suppresses weed growth, and several crops may be planted over the growing season. I will plant buckwheat in that empty space between the potato rows this year.

It's all about diversity, and the long range plan is that I need to build a layered buffet that provides constant blooms throughout the season, including ground covers, annuals, perennial flowers, native grasses, ground covers and trees. Native plants such as butterfly weed, Joe Pye weed, asters, wild bergamot, Virginia mountain mint and New England aster will be featured; however, non-natives such as zinnia, buckwheat, sunflowers and herbs will also be included because they are also effective in attracting beneficial insects. An insectary garden is a form of companion planting based on the attributes plants can share in deterring pests, acquiring nutrients and attracting natural predators, with the added bonus of adding decorative elements to vegetable garden and a bounty of cut flowers for the dinner table.  **It's all starting to make sense**.

Now the hard part: an insectary garden takes patience.  A colony of aphids, cutworms, or squash bugs may appear overnight, but it takes time to build up an army of beneficial insects, and that just doesn't happen in a flash. It has to **start early** in the gardening season. The results are **not instantaneous** but the benefits in the garden are cumulative over time. As the plantings mature and resident populations of beneficial insects become established, the need for chemical pesticides and other aggressive insect control techniques will diminish. Perhaps the most difficult challenge is to identify the pest problem before I react, and resist the urge to spay or dust insecticides. Now when I go on patrol in the vegetable garden, I will go armed with a hand lens and insect reference book. Before I squash that bug between my forefinger and thumb or that egg mass attached to a leaf, I want to know if it is a foe or friend. And this is not as easy as it sounds. There are several bad insects that are very similar to beneficial insects. Two that come to mind are the Mexican bean beetle (bad) and the Ladybug (good) and the brown marmorated stink bug (bad) and the assassin bug (good).

*Mexican Bean Beetle Photo Credit: Stephen Ausmus, USDA, ARS,*

*Lady Beetle*
*Photo Credit: Scott Brown, USDA, ARS, AFRS*


*BMSB and Spined-Soldier Bug Photo Credit: Brent Short , USDA, ARS, AFRS*

Now I'm not sure about going totally insecticide-free. However, I want to give my beneficial army a fighting chance, I now know that beneficial insects are susceptible to insecticides, so the plan is to avoid all those non-selective ones, you know, the ones that claim to control over 200 types of insects. So I will be very selective on the insecticides I choose to use. Once I identify the pest problem, I will avoid those non-specific insecticides. Once it appears my beneficial warriors can't keep up with the villains, I may look at a select few organic products like neem, spinosad, BT. horticultural oil, insecticidal soap, since these products break down quickly and are less damaging to beneficial insects. And just like the bad stuff, read the labels, follow the instructions and comply; because the label is the law.

Now don't tell the wife, but I think she may be onto something with this **Insectary Garden** and I am sure looking forward to the **help** arriving.

**Resources:**

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http://www2.epa.gov/ingredients-used-pesticide-products/ddt-brief-history-and-status

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http://grapes.msu.edu/integrated_pest_management/how_pesticide_resistance_develops

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"Pollinator Plants-Mid-Atlantic Region",The Xerces Society for Invertebrate Conservation. http://www.xerces.org/wp-content/uploads/2014/09/MidAtlanticPlantList_web.pdf

# “What’s light got to do with it?”

By Cleve Campbell | April 2015 - Vol 1. No. 4

Onions.  Yes, light has something to do with onions.  And I have learned that it had something to do with MY onions.  There are so many varieties of onions —  Vidal, Walla Walla, Texas Super Sweet, just to name a few.  But for years the kind I longed to grow were the BIG onions. Man, I have tried, but have failed to achieve those softball-size bulbs found in the super markets and pictured in seed catalogs. I would even settle for a baseball-size onion. The best I could do was something between the size of a golf ball and a lime, until I became aware of an essential environmental element: **photoperiod.**  Here’s how it happened.

After many years of attempting to grow those “**market size**” onions, I came to the unhappy conclusion that perhaps it was time to admit failure and to put that “onion space” in the garden to better use.  Well, having been told on more than one occasion by my wife that I was “hard-headed” and just “plain ole’ stubborn,” I figured what the heck, just one more attempt. Humbly, I did the manly thing and admitted a little research was in order if I was ever going to be able to claim the bragging rights for growing the largest and finest onions in the neighborhood.

Living here in Central Virginia, naturally the first question that flashed across my mind was, “I wonder how **Mr. Jefferson’s onion crop** fared.”  A friend, knowing my interest in gardening and history, recently gave me Peter Hatch’s book, **A Rich Spot of Earth.** I wondered if Mr. Jefferson had experienced the same onion problem as I.  Maybe he had peeled back the proverbial onion and found a solution I might use to resolve my onion dilemma. According to Mr. Hatch,

> “In the South, onions (*Allium* cepa) are a specialty item, grown in quantity under specific conditions. Mid-Atlantic home gardens usually contain only ‘green onions’ or scallions (*Allium fistulosum*), especially because onions are so cheap in super markets. Onions were recorded as being planted in the Monticello garden only nine times. Since onions were a staple in some of Jefferson’s favorite dishes and were purchased twenty-one times from the Washington market in 1806, one might conclude that Jefferson found other sources for this age-old but prized culinary treasure of the subterranean world.” (Hatch, p. 184).

It appears that the onion plantings at Monticello were limited to Egyptian walking onion.  A little more about that later, but for now, the **Monticello** onion revelation was not much help in my quest for softball-size

onions.

My next research stop was the Virginia Tech Publication 426-411 titled "**Onions, Garlic and Shallots**." Here are the environmental preferences of onions as listed in Pub. No. 426- 411:

- **Ligh**t: s**unny** (Check; my garden spot is in full sun and gets at least 8 hours of sun depending on the time of year).
- **Soil: well-drained** (Check; my unsuccessful attempts were performed in a well-drained raised bed.
- **pH: 5.5- 7.0** (Check**;** a soil test revealed a pH of 6.6.
- **temperature**: **Cool** (45-60º F) during development; medium to hot during bulbing and curing (60-75º F) (Check)
- **Moisture: moist** but not too moist (Check)

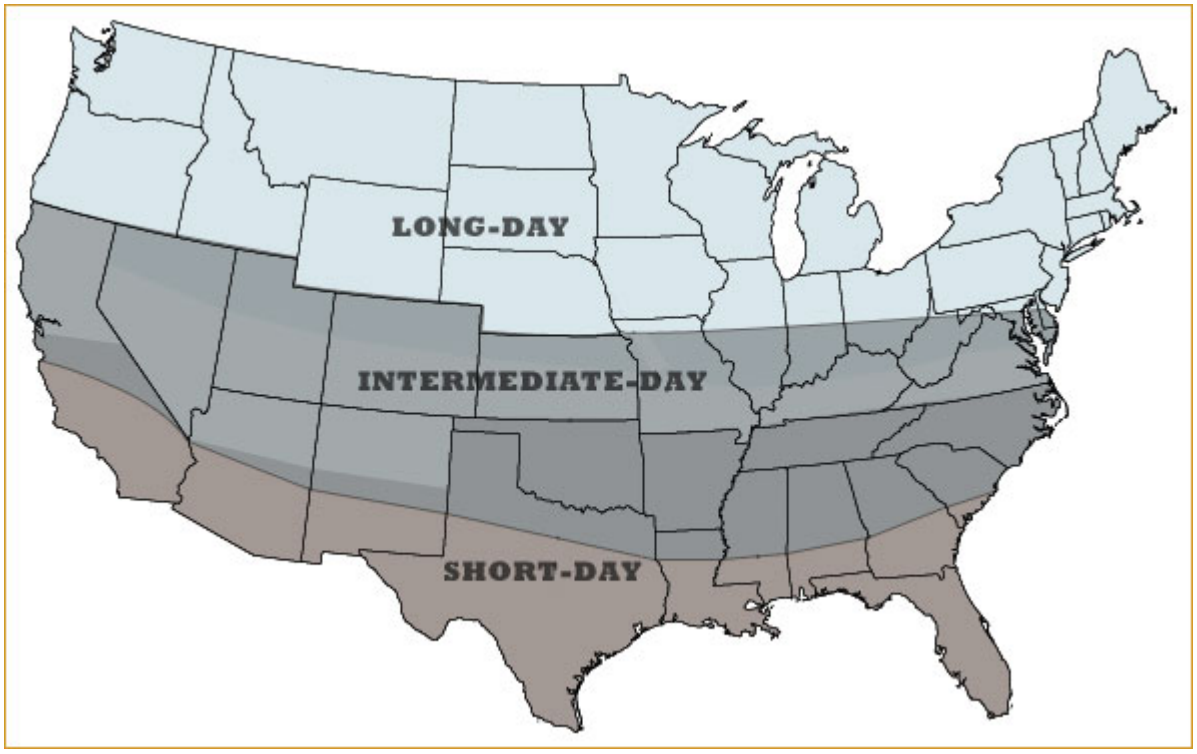
Having run though the environmental checklist with flying colors, now what? There must be something that I missed. A little humbled, I decided to do the unthinkable: I revisited the publication and proceeded to read whole thing. Well, you guessed it; I had indeed missed something important. I learned that there are three different groups or **categories** of onions: "long-day" onions, "short-day" onions and "intermediate-day" onions (also called "day neutral"). What was that all about? Hmmm, perhaps something to do with **daylight length**? This reminded me about that old thermos bottle story — it can keep stuff cold or hot. How does it know which to do? You're right. A little more research was required.

Most onions, as it turns out, are **biennial** plants, which is just a fancy way of saying that it takes two (2) growing seasons to complete the **life cycle**. In its first year, the onion plant develops and produces a bulb that is used for food storage, and in the following year, it produces flowers and seeds. In short, onions have three (3) "major" phases of growth: the **vegetative phase**, when roots and leaves are produced by the plant, the **bulbing phase** when bulbs are produced, and the **reproductive phase,** when flowers and seeds are produced. The bulbing stage and flowering stage are usually separated by a cold (vernalization) period. Onions grown for their bulbs are treated as annuals and harvested at the end of phase two (2). The three distinct phases are driven by temperature and **length of day,** also known as photoperiod. Since onion bulb development depends on the temperature and length of day, random planting during our growing season here in Virginia will result in limited success.

The **size of the onion bulb is dependent upon the number and size of the green leaves or tops at the time of bulb maturity**. For each leaf there will be a ring of onion; the larger the leaf, the larger the ring will be. The onion will first form the top, and then, depending on the onion variety and length of day, it will start to form the bulb. (Magruder). Herein lies the challenge: the requirements for leaf and foliage development and the requirements for bulb development are different. Since the onion is a cool weather crop, foliage development requires a temperature of 45-60º and bulb formation requires a temperature requirement of 60-75º for optimum bulb size.

In addition to temperature, bulbing is initiated when the daylight length reaches the number of hours critical for that variety. In short, temperature and daylight length are the factors that determine when vegetative growth stops (phase 1) and bulb development (phase 2) begins (Lancaster). There have been attempts to isolate the trigger that moves from leaf growth to onion development, but these have been unsuccessful. (Remember that how-does-it-know thermos story?), but some research suggests that hormones and growth regulators such as auxin, cytokinin, gibberellins, and ethylene have been implicated in bulbing (Brewster). However, research conducted at Texas A&M and The U.S. Department of Agriculture concluded that no evidence could be found to support the claim that treating onions with growth regulators and hormones increased the size or weight of onion bulbs.

**The selection of the correct varieties and planting times are critical for success.** Choose a short-day variety when day length is 11-12 hours (latitudes less than 35 degrees); choose intermediate-day types when day length exceeds 13-14 hours (middle latitudes) and remember that long-day types require greater that 16 hours of day, (latitudes greater than 39 degrees). (Brewster). Our approximate latitude in central Virginia is 38 degrees, so we just happen to be between the short day and long day categories. Our longest daylight day is 14 hours and 48 minutes — obviously too short for long-day onions. But wait, 14 hours is more than enough time for short-day onions. But since the length of day is what triggers bulb development, in our area that 12-hour trigger is March 17. That's because the size of the bulb depends on the top or foliage development, and we do not usually reach the optimum temperature ranges for that (45-65 degrees) until March 17. That's just a roundabout way of saying that around here, the bulb starts to form before there is sufficient leaf development to grow a large onion bulb. In the fall it's just the opposite; we have the correct temperature for top development but lack the 75-85 degree temperatures for good bulb development. So cutting through all that mumbo jumbo, the area we live in is not ideal for growing short- or long-day onions. Therefore, we are limited to intermediate-day onions. The chart below depicts the growing ranges for the various types of onions:




*Source: Waldeneffect.org*

Seed catalogs often provide the length of day requirements for the onions they offer, and in a few instances, provide information such as "adaptation 35 degrees-45 degrees latitude." In short, to increase the probability of having a successful bulb onion crop in our area, one needs to be cognizant of the category of onion that grows best here. In our area, short-day and long-day onions will have limited success, whereas the intermediate-day onions — such as **Candy F1, Candy (Red) F1, Crystal, Gladstone or Super Star — will have greater success** .

Many of these varieties are available from various seed catalogs as seeds or starts. If you want to start onions indoors and transplant them to the garden, they need to be started in January. Seedlings or plants can be ordered from various catalogs. Several of our local garden centers often carry intermediate-day onions in the early spring.

In our area onion plants should be set out as soon as the ground is workable and up into mid-April. As for the bulk small onion bulbs (labeled: yellow, white and red) on sale in garden centers and big box stores or at our local hardware stores, their variety and length of day requirements are unknown; however, if your goal is to grow spring onions for their green foliage — not for a big "bulb" onion — they will work in our area for that purpose.

Once I figured out all that long-day, short-day and intermediate-day stuff, the actual cultivation of onions was relatively easy. Va. Tech Publication 426-411 offers detailed instruction on the cultivation requirements.

Wow, I remember that first softball candy onion I grew. I couldn't wait to cut into that sucker. Well, let me tell you, I didn't know I was capable of so many tears, and when I took a bite, it was strong. It turns out that onions have a defense mechanism; when you cut in into an onion and damage the cell walls, it releases a compound called Syn-propamethial gas, which is a sulfate derivative. In general, clay soils and organic matter have a relatively high level of sulfates (Brewster). I have clay soil, which has been amended with organic matter, which means that because of these high sulfate levels, I'll never be able to grow that sweet onion that can be eaten like an apple.

Now the only thing left to figure out is when to harvest the onions. As a general rule the onion tops will turn slightly yellow and "fall over." The onions should be harvested shortly after the tops have fallen over. Don't leave the onion bulbs in the ground longer than a week or two after they have fallen because the bend in the onion stalk is a weak point and can provide a roadway for organisms to enter the plant. These organisms may cause the onion to rot prematurely. Naturally onions may be harvested before they fall over to be used fresh in the kitchen. Also, intermediate-day onions are not considered long storage onions or good keepers, and my experience is they can be stored for 3-4 months before they begin to go bad.

Now back to **Mr. Jefferson** and **Monticello.** What is now known about photoperiod and its impact on onions had not yet been discovered in Jefferson's time. That didn't happen until 1920. Therefore, the importance of selecting the correct length of day variety may have been an unknown in Jefferson's day. In addition, the soil at Monticello is clay, and in all probability has a high sulfur content, which will increase the pungency of the onions, and may have led to the perception that "northern" onions were sweeter and of better quality. Or it may be, as Mr. Hatch suggests in his book, bulb onions were so cheap that the space in the vegetable garden at Monticello could be put to better use.

**In summary**, onions are a cool weather crop. The development and size of an onion bulb is dependent on two environmental factors: temperature and length of day. There are three (3) categories of onions: short-day, intermediate-day (or day-neutral) and long-day. In Central Virginia, because of our location we can expect to be successful with the selection of an intermediate-day type onion such as **Candy F1.**

The heat or pungency in an onion is directly correlated to the level of sulfur in the soil; therefore, because our clay soils have a tendency to have moderately high levels of sulfur, one would expect the onions we grow to be on the pungent or hot side. I was pleasantly surprised at how successful I was when growing the intermediate-day type onion, and hopefully you too will be successful.

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# The Edible Garden Tips & Tasks — April

By Cleve Campbell | April 2015 - Vol 1. No. 4

Several days ago, I remembered I hadn't sharpened the lawn mower blades; however, before I could get started on that task, I needed to make a trip to the local hardware store to purchase a file. As I approached the store entrance, I couldn't help but notice several racks of stunning tomato plants on display. Once inside the hardware store, I selected a file, and while I was waiting at the counter, I noticed that the gentleman in front of me was purchasing a dozen tomato plants. He completed his transaction, and as I was paying for the file, I asked the owner, "What kind of plants did that guy purchase?" The owner responded, "**Practice plants.**"

Now, having planted my share of tomato plants, I know what a tomato plant looks like, so I just had to ask, "What are practice plants?" "Well," said the owner, " we get a few days of warm weather, and folks get into this all-fired-up hurry to set out tomato plants. I tell them it's not safe till May, and that if you set them out now, you'll need to cover them up at night or the frost will kill them. They never listen. Then they come back in here complaining that their tomato plants died, and buy replacements. That's why I call them practice plants; happens ever year." Hmmm. Practice plants. Never heard of them, wonder if they are an heirloom variety? They may not be heirlooms, but I'm sure my friend in the hardware store thinks practice plants are good for business.

After a long cold winter, April can be a teaser month. Some years April appears to have all four seasons rolled into one month; we can have days with 70-80 degree temperatures, followed by night temperatures dipping below freezing. And once in a blue moon, like in April 1971, we are even blessed with snow. Along with the **roller coaster temperatures** and more than enough rain to keep us out of the garden, April can be a trying month. It is a month when patience is truly a virtue.

On my trip home from the hardware store, I got the planting fever. The mower blades will have to wait. Remembering those practice plants, I headed to the VCE Publication 426-331 "Vegetable Planting and Recommended Planting Dates." My friend in the store was right — according to the publication, the **average last killing frost** in our area is May 10-May 15. Then after filling in the dates at the top of the page, I used May 10 as our last frost date and created the following planting schedule:

| April 1-11 | April 12-18 |
|---|---|
| Asparagus | Asparagus |
| Beets | Beets |
| Cabbage* | Broccoli* |
| Chinese cabbage* | Brussel Sprouts* |
| Carrots | Cabbage* |
| Swiss Chard | Chinese cabbage* |
| Collards | Carrots |
| Leeks | Cauliflower* |
| Lettuce, Bibb | Swiss Chard |
| Lettuce, leaf | Collards |
| Mustard | Leeks |
| Onions (set) | Lettuce, Bibb |

| | |
|---|---|
| Peas, garden | Lettuce, leaf |
| Potatoes | Mustard |
| Radish | Onions (sets) |
| Spinach | Peas, garden |
| Turnips | Potatoes |
| | Radish |
| | Spinach |
| | Turnips |
| April 19-25 | April 26-May 2 |
| Asparagus | Beans, Bush |
| Beets | Beans, Pole |
| Broccoli* | Beans, Wax |
| Brussel Sprouts* | Beets |
| Cabbage* | Broccoli* |
| Carrots | Brussel Sprouts* |
| Cauliflower* | Cabbage* |
| Collards | Carrots |
| Leeks | Cauliflower* |
| Lettuce, Bibb | Leeks |
| Lettuce, leaf | Lettuce, Bibb |
| Onions (set) | Lettuce, leaf |
| Mustard | Swiss Chard |
| Swiss Chard | Onions (set) |
| Turnips | Radish |
| Radish | |

* Denotes Transplants

The suggested dates may vary for different areas.

**There's still time.** Tomato, eggplant and pepper can still be started indoors from seeds.

**April is a good time to invest in a soil thermometer.** The cause of poor seed germination is often cold soil. If the soil is too cold, seeds of some plants will rot before they have a chance to sprout. A chart providing information on soil temperatures for optimum germination for vegetable seeds can be found in VCE Publication 426-316, titled "Seed for the Garden."

**Feeling unsure about what varieties of vegetables to plant?** VCE Publication 426-480 "Vegetables Recommended for Virginia," provides a list of recommended varieties.

**To save space in your garden**, you can construct temporary or permanent woven wire "fences," which will provide vertical support for runner varieties of beans, as well as for cucumbers. Plants can be trained to climb the fences, saving not only space but also making harvesting easier as the vegetables will be hanging down. For additional information on vertical gardening see VCE Publication 426 titled "Intensive Gardening Methods."

**Saving Space: S**now peas growing up a temporary fence. Note the sequential planting of "pole" Lima beans at base of fence.

One of the most **important steps** in planting comes before seedlings get near the garden. This is the process of **hardening off,** or gradually acclimating seedlings to outdoor conditions. These plants have spent their short lives in a warm, sunny, protected place and won't fare well if the plants are not exposed slowly to the elements. A few days before you are ready to begin hardening plants off, reduce the amount of water you give them, and cease fertilizing until they are planted in the garden. About 2 weeks before you intend to set them outside, put your transplants outdoors in an area where they'll be protected from the direct sunlight and wind. Leave them out for a few hours and bring them back inside. Repeat this each day, gradually increasing the amount of time they are outside and the degree of exposure to sun and wind. After a week or so, leave the transplants out overnight. If frost threatens, bring the seedlings indoors. Additional information on hardening off can be found at VCE Publication 426-001 titled: "Plant Propagation From Seed."

**When transplanting seedlings in peat pots**, gently tear off the top inch of the pot; the upper edges of the pot should be covered with soil to avoid wicking water away from the soil surface. Wicking may reduce the amount of moisture available to the roots of the plants.

**The best time to transplan**t is on a cool cloudy day or late in the afternoon to avoid the hot sun. The plants then have time to acclimate themselves to their new environment. If the following day is hot and sunny, a row cover may used to reduce the stress on the plant. A row cover may also be used to help protect young transplants from a late frost.

**Break the rule when setting-out tomato plants.** The general rule for transplanting most plants is that the planting depth should be no deeper than the soil level they were originally grown in. This rule does NOT apply to tomato plants. The general rule for tomatoes is that 2/3 of the tomato plant should be **below soil level.** First, gently remove the leaves on the bottom 2/3 of the plant before planting. Planting deep allows **roots to sprout** along the buried stem (adventitious roots). This results in a better and stronger root system and the end result is better tomatoes. In heavy soil or if you just don't want to dig deep, you can lay the plant on its side, provided that 5-6 inches of soil is placed over the roots and stem. For additional information on growing tomatoes see VCE Publication 426-418 titled "Tomatoes."

**Tired of losing tomato plant labels** during the growing season? Punch a hole in the plant labels and attach the label to the stake or wire cage with a thin wire.

# Catmint — A “Must-Have” Perennial

By Patsy Chadwick | April 2015 - Vol 1. No. 4

*Catmint 'Walker's Low'*

If you're looking for a perennial that is long blooming, heat tolerant, resistant to pests and diseases, and easy to grow, then allow me to recommend catmint (or *Nepeta*) to you. After years of experimenting with drought-tolerant and deer-resistant plantings, I still include this top performer on my list of "must have" plants. It plays a prominent role in my ornamental garden and provides interest in all four seasons. It has attractive gray-green foliage that emerges in neat, tidy mounds in April. By May, the plant fairly explodes with a profuse haze of soft lavender-blue flowers. After the initial flush of blossoms, the plant continues to show lots of color well into late summer or early fall. Colorful calyces that are similar in color to the blossoms enhance the floral display even after the blossoms are gone. Left standing over the winter months, the foliage fades to a pleasing soft silvery gray color.

*Emerging Catmint Foliage*

This herbaceous perennial is a member of the mint family (*Lamiaceae*), which includes lavender, rosemary, thyme, bee balm and giant hyssop. In addition to having aromatic leaves, these plants share other common traits, such as two-lipped flowers, square stems and opposite leaves. Many people confuse catmint with catnip *(Nepeta cataria*). While the two are closely related, catnip is more aromatic than catmint but has less ornamental value.

Catmint plays well with others. If you love the classic combination of lavender and roses but find lavender too finicky to grow in this area, catmint is a good substitute. Just like lavender, catmint can be used to cover the bare "limbs" of rose bushes. It's cool-toned foliage and flowers offer a pleasing counterpoint to the vivid tones of the roses.

Catmint blends well with most other colors but looks particularly appealing when paired with colors in the red-blue color spectrum. In my own garden, it looks stunning planted with irises. In particular, it pairs well with the medium lavender-blue iris 'Crater Lake' and with the blue-violet hues of iris 'Swingtown.' The mounded shape contrasts nicely with the vertical silhouettes and deeper lavender shades of *Allium* cultivars 'Gladiator,' 'Giganteum,' or 'Purple Sensation.' As spring merges into summer, catmint harmonizes well with the cascading burgundy foliage of 'Garnet' Japanese Maple or with the purple foliage of *Heuchera* 'Plum Pudding.' 'Purple Ruffles' basil is yet another terrific companion for catmint, plus it's edible! Yellow-flowering plants such as *Hemerocallis* 'Happy Returns,' *Achillea* 'Coronation Gold,' or *Coreopsis* 'Early Sunrise' also make a pleasing combination with catmint.

The most popular catmint cultivars grown commercially in this country belong to the hybrid *Nepeta x faassenii*. The plants are named for J. H. Faassen, a Dutch nurseryman, in whose nursery this hybrid first appeared. The flowers of *N. x Faassenii* are sterile and do not need to be deadheaded to prevent self-sowing.

Whereas members of the *N. X faassenii* family are sterile, other related species, such as the following, are fertile and may need to be deadheaded to prevent reseeding:

- Siberian catmint (*N. sibirica*) – Tall (two to three feet) upright plant with large green leaves and rich blue flowers.
- Japanese catmint (*N. subsessilis*) – Unlike the other varieties of catmint, this one prefers moist soil. Although it will take full sun, it likes partial shade.
- Yellow catmint (*N. govaniana*) – Native to the Himalayas, this hard-to-find variety has yellow flowers which bloom later in the summer.
- Veined Nepeta (*N. nervosa*) – Native to India, this species grows one to two feet tall and is characterized by strong veins on three- to four-inch long leaves.
- Greek catmint (*N. parnassica*) – This catmint, which is more commonly found in European gardens than here in this country, grows to an impressive four to six feet tall and wide.

In a comparative study of catmints conducted by the Chicago Botanic Garden between 1999 and 2006, 36 catmints were evaluated with the goal of identifying outstanding specimens in terms of their ornamental traits, disease and pest resistance, cultural adaptability, and winter hardiness (the botanical garden is located in zone 5b). Of 22 catmints that were highly rated, the following four top performers received five-star excellent ratings based on their heavy flower production over a protracted bloom period:

- 'Joanna Reed' – Lavender-blue flowers on 24-inch tall by 48-inch wide plants. It is named for the late Pennsylvania gardener who discovered it.
- 'Six Hills Giant' – Lavender-blue flowers on 30-inch tall by 48-inch wide plants.
- 'Select Blue' – Lavender flowers on 14-inch tall by 30-inch wide plants.
- 'Walker's Low' – Lavender-blue flowers on 30-inch tall by 36-inch wide plants. As an aside, the name comes from a garden in Ireland and not because it is short. In fact, it is nearly as tall as 'Six Hills Giant.' In 2007, the Perennial Plant Association selected 'Walker's Low' as their Perennial of the Year.

If you're compelled to look for catmint in the local garden centers, don't limit yourself to just these four selections. Many other excellent cultivars are available, such as 'Dropmore,' 'Blue Wonder,' and 'Junior Walker,' which, at 16 inches tall, is a shorter version of 'Walker's Low.'

HOW TO CARE FOR CATMINT

- Give catmint plenty of space as it tends to grow wider than tall.
- Although it prefers full sun, catmint will thrive with some afternoon shade.

- Keep new plants or transplants watered until they can fend for themselves. After that, established plantings are drought and heat tolerant.
- Don't bother to fertilize it. Catmint prefers well-drained soil that is not overly fertile. In fact, soil that is too rich may cause the plant to flop over or split in the middle. Should that happen, shear the plant back to tidy it up. Some compost in fall or spring will provide sufficient nutrients to keep the plant happy.
- Shear the plants back by a third or more after their first flush of bloom is past. This will neaten the plants, contain their size, and encourage a second flush of blooms later in the summer. Even without being sheared, the plant will repeat bloom and continue to look attractive over the hot summer months.
- Leave spent foliage in place over winter to help protect the crown. Wait until early spring to cut it back.
- To keep catmint vigorous, divide it every three to four years in either spring or early fall. Keep it well watered the first growing season until the plants become established.
- Some cultivars of catmint can grow quite large. If you want to contain the overall size of the plant, pinch it back in spring after it is a few inches tall to promote a bushier growth habit.

HOW TO PROPAGATE CATMINT

- To propagate catmint, slice off a vertical section of an established clump in spring. Make sure the division has several young shoots and a substantial root system. Keep well watered until the plant becomes established.
- Catmint may also be propagated through cuttings. Take three-inch long cuttings of healthy shoots in the spring before flower buds form. Insert the cuttings into a moist medium such as sand or a peat-perlite mix. They should root within two or three weeks.

PESTS, POLLINATORS, AND OTHER CONSIDERATIONS

- With regard to pests and diseases, catmint is generally untroubled by either. Leaf spot is the only problem that occasionally occurs. This fungal disease is not considered serious enough to warrant control practices.
- As I have learned from experience, some cats are attracted to catmint. If this is a concern for you, place chicken wire over newly planted or transplanted catmint to prevent kitty from eating or rolling around in it.
- This plant is a veritable bee and butterfly magnet. As a bonus, hummingbirds love it as well.
- If four-footed critters other than cats are a problem in your garden, you'll love this plant. Its minty, aromatic foliage repels rabbits, voles, and deer. Now THIS is a plant that earns its keep!

RESOURCES

Armitage, Allan M., "Herbaceous Perennial Plants," Third Edition, 2008.

Clausen, Ruth Rogers, "50 Beautiful Deer-Resistant Plants – The Prettiest Annuals, Perennials, Bulbs, and Shrubs that Deer Don't Eat," 2011.

"A-Z Encyclopedia of Garden Plants," published by The American Horticultural Society, editors-in-chief Christopher Brickell and H. Marc Cathey, 2004.

"A Comparative Study of Cultivated Catmints," Richard G. Hawke, Plant Evaluation Manager, Chicago Botanic Garden, https://www.chicagobotanic.org/downloads/planteval_notes/no29_catmint.pdf.

# The Ornamental Garden in April

By Patsy Chadwick | April 2015 - Vol 1. No. 4

April teaches us lessons in both vigilance and patience. Bright sunny days and warm spring breezes lull us into thinking cold weather is behind us. But we need to stay vigilant for sudden dips in nighttime temperatures that can result in deadly overnight frosts. If spring rains make the soil too wet to work, we must be patient and wait for drier gardening conditions.

If a frost is forecast, **protect tender new growth** with row covers, old sheets, cardboard, or even layers of newspaper. Just remember to remove the coverings the next morning. Otherwise, you may accidentally "cook" your plants as day-time temperatures rise.

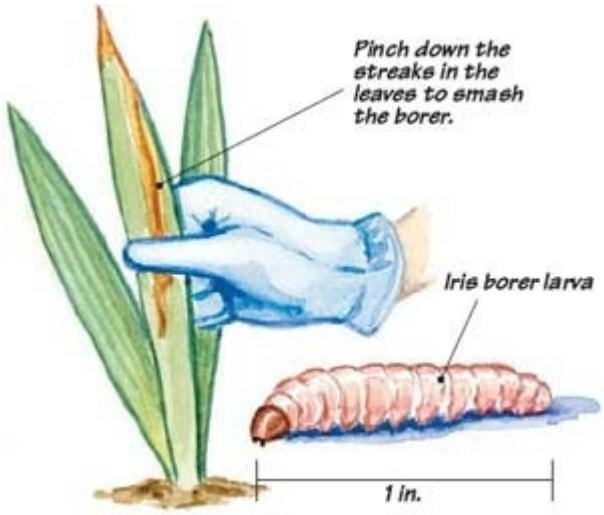
N**ote the location of emerging spring bulb clumps.** If you haven't drawn a plot of your garden, now is a good time to sketch one before bulb foliage dies back. This map will come in handy later to help you avoid digging into and damaging the bulbs. Another good habit is to use a garden journal to record the location, cultural requirements, and other useful information about each of your plants.

**Fertilize spring-flowering bulbs** after they finish blooming. An organic fertilizer especially formulated for bulbs is a good choice. Avoid using a high-nitrogen fertilizer which may promote lots of lush-looking foliage at the expense of flower production next spring.

**Cut daffodil and hyacinth flower stalks** to the ground after they finish blooming. Why? Because you want the bulbs to focus on storing energy for next year's blossoms and not on developing seed heads. Do not cut the foliage. Also, don't braid it or tie it because this interferes with photosynthesis. Just let the foliage die back naturally. The leaves are needed to produce strong bulbs for next season's blossoms.

**If your daffodils have become crowded and aren't producing as many flowers as in past years, they need to be divided.** Mark the location of the clump so that you can find it later in the summer after the foliage has died back. A golf tee, plastic knife, or wooden stick is useful for this purpose. Make a note to dig up and separate the bulbs in July.

**Check emerging irises for diseases or borer damage**. Leaf Spot is one of the more common fungal diseases of irises. For information on symptoms and controls of this disease, see VCE Publication 450-600 – Iris Leaf Spot (http://www.pubs.ext.vt.edu/450/450-600/450-600.html). Iris borers are another common problem. Borer larvae feed below the soil level on the rhizomes. Feeding damage is sometimes not apparent until the plant dies or the leaves wilt. Inspect young iris foliage for notches in the edges of center foliage and slimy frass. If you detect the presence of a borer caterpillar in the leaf, crush it with your fingers. If the borer gets to the rhizome, this pest will hollow it out and then proceed to other rhizomes**.** Bacterial soft rot often follows borer damage. Removal of all dead or damaged leaves in the fall is the best way to control this pest. Either burn the foliage or dispose of it in the trash. Do not compost diseased irises. See the American Iris Society website for additional information on iris pests and diseases (www.irises.org).




*Iris Borer Larva*

As you select new plantings, **avoid plant species that are potentially invasive** in this area of Virginia. Instead, consider using native plants that minimize maintenance, require less water, and increase habitat, particularly for beneficial insects. If you're interested in learning more about native plants, a number of excellent resources are available on the subject. For example, see the Virginia Native Plant Society's website at http://vnps.org/ or check out the Albemarle County Recommended Native Plants website at http://www.albemarle.org/nativeplants/. The Virginia Department of Conservation and Recreation's Natural Heritage Program at www.dcr.virginia.gov/natural_heritage/nativeplants.shtml is yet another excellent resource. Also, see Cathy Caldwell's article on invasive plants in the February 2015 issue of The Garden Shed.

**Before digging holes for new plantings,** keep in mind the ultimate size of each plant. Allow ample space for growth and good air circulation. Also, group new plantings according to similar needs for water, fertilizer and sun.  Don't forget to update your garden plot or garden journal showing the location of your new plantings.

Spring is the time to **divide perennials that bloom later in the growing season**. Most perennials benefit from being divided every three to five years. Once the soil is dry enough to work in safely, divide perennials such as fall asters, chrysanthemums, shasta daisies, baby's breath, coneflowers, Rudbeckia, ornamental grasses, sneezeweed, Boltonia, false chamomile, coral bells, leopard plant, and bee balm. Alternatively, most spring-blooming perennials should be divided in the fall.

**Pinch back chrysanthemum foliage** this month when the plants are about four inches high. This will make a bushier, sturdier, more wind-resistant plant later in the season. False sunflower (*Heliopsis helianthoides*) is another plant that benefits from being pinched back in spring to shorten the plant. This late summer-blooming native perennial may be divided in either fall or spring.

**Deadhead the spent blooms of Lenten rose** (*Helleborus orientalis*) to tidy it up while the foliage is filling in. Be careful not to snip emerging new foliage by accident.

When shopping for bedding annuals from nurseries, **choose healthy plants with well-developed root systems** that are not too large for their pots. As you plant them, pinch off any blooms so that the plant diverts its energy into developing a healthy root system. Yes, you may be reluctant to do this, but sacrificing

a few blossoms initially will reward you with healthier, more floriferous plants later. If you're new to gardening and would like more information on growing annuals, see VCE Publication 426-200, Annuals: Culture and Maintenance (http://www.pubs.ext.vt.edu/426/426-200/426-200.html).

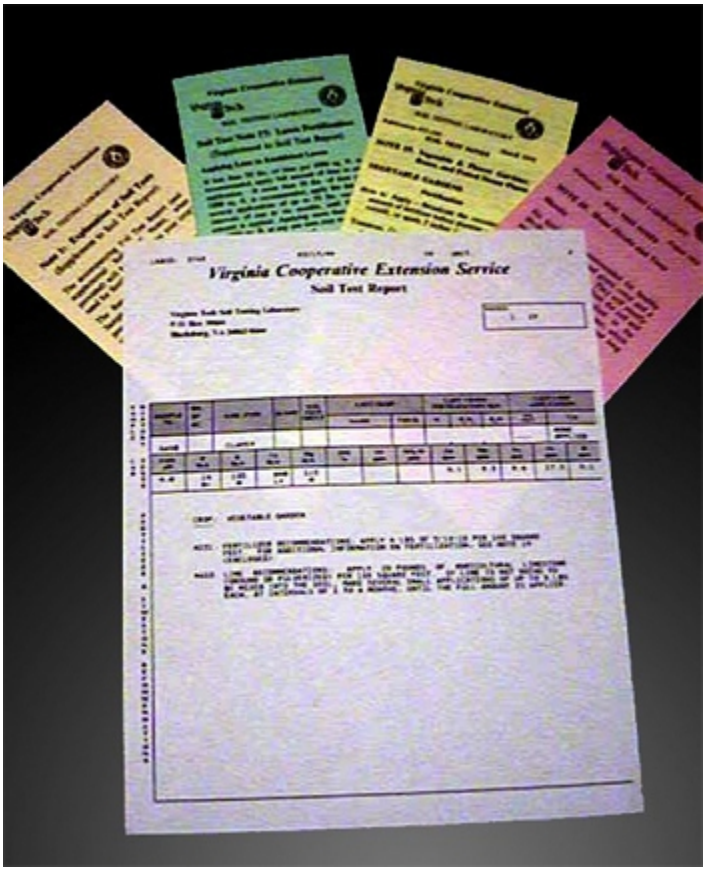
**Keep new bedding plants evenly moist** while they are developing sturdy root systems but don't drown them. Too much water may cause the roots to rot.

If you start your own annuals indoors from seed, **gradually introduce the seedlings to the outdoors**. Place them in a shady location initially and bring them indoors at night if temperatures are predicted to drop below 50°F. Gradually leave the plants outside for longer periods of time until they are fully acclimated and can be safely planted outside. Remember – a frost can occur up to about mid-May in the Albemarle County area, so be careful not to plant seedlings outside too soon. Tip: Your bedding plants will acclimate better if you plant them on a cloudy day. If that's not possible, then plant them late in the day when temperatures are cooler.

M**ove your houseplants outside,** once night-time temperatures consistently stay at 50° F. or higher. But before you do, repot any root-bound plants in slightly larger pots. Fertilize with a slow-release fertilize or with fish emulsion. Place your plants in a shady area initially so that they can gradually acclimate to being outside.

# Soil Testing

By Cleve Campbell | April 2015 - Vol 1. No. 4




**A soil test** is one of the best investments a gardener can make. The purpose of a soil test is to provide the gardener with information necessary to make a **wise investment** in fertilizer and soil amendment choices. Performing a soil test is one of the first things any gardener should do regardless of what is to be planted. A soil test report will provide a wealth of information:  the pH level, available phosphorus (P),  potassium (K), calcium (C), magnesium (M), zinc (z), manganese (Mn), copper (C) and iron (Fe) components of your soil. These elements are essential for healthy productive plants, trees and lawns.

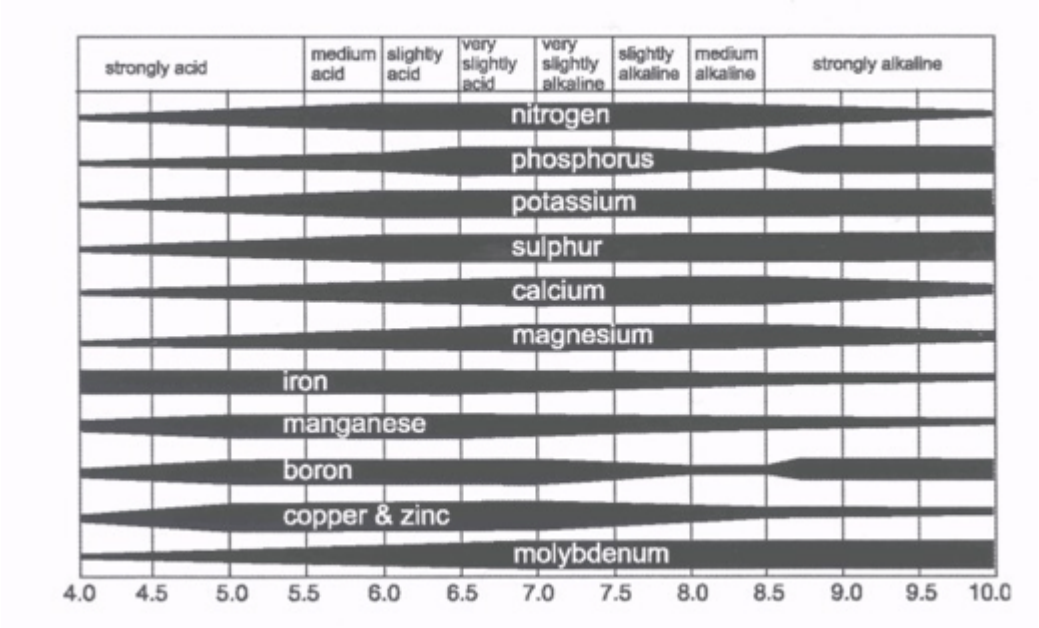
One of **the most important** soil factors that affect a plant's growth and health is the pH level of the soil. The soil pH test measures how acidic or basic the soil is. The pH scale is a logarithmic scale and ranges from 0-14;  a pH level of 7 is neutral. A pH less than 7 is acid and a pH greater than 7 is basic. Since the pH scale is logarithmic, a soil with a pH of 5.7 is ten (10) times more acid than a soil with a pH of 6.7,  and a soil testing 4.7 is 100 times (10X10) more acidic than a soil testing 6.7. The same principle holds true for soils testing above 7.0 —  each is whole number 10 times more alkaline or basic than the next whole number. This explanation may be confusing for those of us who are "math challenged,"  but the main thing to remember is that when the pH needle moves one whole point,  it's not just one point it's **10 times** that because the pH scale is logarithmic.

The degree of **acidity** or **alkalinity** of the soil is directly related to the availability and uptake of soil nutrients to plants. At pH extremes, some nutrients become partially or completely locked up in the soil and become unavailable to plants. In short, the pH factor is the keeper of the nutrient key. **Adding amendments or fertilizer to soils with extreme pH levels will have little or no effect on plant growth.**  Correcting

the pH level opens the  nutrient door and makes amendments and fertilizers effective.

For lawns, The Soil Lab at Virginia Tech will recommend adding soil amendments (primarily lime) to soils testing less than a pH of 6.2.

**The Effect of Soil pH on Nutrient Availability**




*Source: National Soil Survey Manual (NRCS)*

As we can see, **the thicker the bar** the more available the nutrient. A pH above 6.2 will insure that all nutrients are available for a beautiful lawn. In our area, in very rare cases, an application of sulfur is recommended to lower the pH  to the 6.2-6.8 range; but a high pH in our area usually means that improper quantities of amendments (lime and or wood ashes) have been added to the soil.

**Soil test kits** are available at your local extension office and also at garden centers throughout Charlottesville and Albemarle County.  The Albemarle County/Charlottesville office of Virginia Cooperative Extension is located at 460 Stagecoach Road, just off of Fifth Street Extended in Charlottesville.

**Some general rules about soil sampling**:

1. If the soil is too wet to work, it is too wet for a sample. Slightly wet samples can be dried on newspaper prior to sending the sample in for analysis.
2. Rocks, twigs, grass or any other debris must be removed from the sample.
3. Samples from mulched beds should be taken after the mulch is removed from the area.
4. Do not take samples from areas where the soil conditions are different from the rest of the landscape such as pet areas, brush piles, wet spots, and landscape borders.

**When and how should soil samples be collected?** Ideally soil samples should be taken a few months before any new landscaping is planned. This allows any nutrients that are added to start working in the soil. Generally, a  soil test should be taken once every 3 to 4 years. A soil test should also be considered if there is abnormal growth or a change in plant color. However, samples should not be taken within six to eight weeks of fertilizing or liming.

**Where and how many unique soil samples should be taken?** Generally in the home landscape, a different soil sample should be taken from **each planting area**; thus, separate samples should be taken from the lawn, the perennial flower beds, and the vegetable gardens. Additional samples may be necessary if, for example, one part of the lawn area is fescue and the other Bermuda. The key is that all the soil in a sample box should come from a uniform area because what your lawn needs is usually quite different from what your shrub border or flower bed needs.

**Tools** for taking the soil sample include a shovel, trowel, spade, or soil sampler, and a clean plastic bucket. The tools should not be brass, bronze or galvanized because they can contaminate the sample with copper or zinc.

**Sample depths** depend on the type of plant and range from 2-4 inches for lawns, 6-8 inches for vegetable and flower gardens and 6 inches for trees and shrubs. The sample is taken by inserting the shovel into the soil at the appropriate depth, and removing a soil plug 2 inches wide and one inch thick. The sample is placed in the plastic bucket and another sample is taken from a different location but in the same uniform area as discussed above. Thus, you will collect several samples from different parts of your lawn, but they will all go together into one sample box to be sent for analysis. A zig- zag pattern across the sampling area provides an accurate cross- section of the soil in that area. At least 10 samples should be taken of each area, but even more samples may produce more accurate results.

Once all the samples are collected they should be thoroughly mixed together, removing the debris, and if necessary, dried out thoroughly and packed tightly in the soil test box. It is very important to give each box a unique identification number with the same number on the box as well as on the accompanying information form. Using the correct plant code list from the soil sample information sheet will insure the most accurate recommendation for your planting area.

**The soil test report** comes from Virginia Tech in a few weeks and is the valuable end result of all this work. The report contains the following information: name of the crop, lab results, fertilizer recommendations, recommended lime amounts to add, and soil organic matter. For a detailed explanation of the contents of a soil test report, look at https://pubs.ext.vt.edu/452/452-701/452-701.html).

Because every soil test is different, it is very important to review the report for each **unique** area sampled. For example, the explanation of soil test reports for lawns are found at VCE Pub. No. 452-717 (cool season grasses) and at VCE Pub. No. 452-718, (warm season grasses). For vegetables and flower gardens, explanatory keys for soil test reports can be found at VCE Pub. No. 452-719.

With your soil test report in hand, you will be able to add necessary amendments in the right amounts to create a fertile environment for your lawn, your flower bed and your vegetable garden. Doing a soil test is one of the best ways and most certainly least expensive ways of insuring that your landscape will flourish.

# ARUGULA AND NECTARINE SALAD

By Cleve Campbell | April 2015 - Vol 1. No. 4

**DRESSING:**

3 tablespoons raspberry vinegar

1 teaspoon Dijon mustard

5 tablespoons extra virgin olive oil

Pinch each of sugar, salt, and pepper

**SALAD INGREDIENTS:**

4 cups of torn arugula leaves

4 cups of torn romaine lettuce leaves

2 or 3 ripe nectarines (peaches may be substituted) cut in slices

1/3 cup toasted walnuts (toast 5 to 8 minutes in 300 degree oven or toaster oven)

Combine dressing ingredients and mix together well. Arrange salad ingredients in bowl. Pour dressing over salad mixture. Sprinkle with toasted walnuts.

Serves 6 to 8