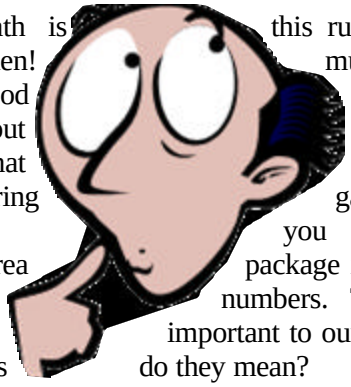
High on the Desert Cochise County Master Gardener Newsletter

Vol. 24, No. 2 February 2013

The University of Arizona and U.S. Department of Agriculture Cooperating

The Virtual Gardener—Garden Math

There's no escaping it. Math is everywhere—even in the garden! Besides curling up with a good seed catalog this winter, how about learning a little garden math so that you're ready to use it next spring when it's time to plant again?



Suppose you have a garden area that is 25 feet long and 15 feet wide that you want to fertilize. You've read that our desert soils are deficient in nitrogen and sometimes phosphorus and potassium as well, so that's what you want to add...but how much? If you really want to be scientific about it, you could send a soil sample off to a laboratory for analysis which would give you some precise numbers, not only for how much nitrogen to add but other nutrients as well. If you're not so scientific, you could use a rule of thumb. One such rule you may see is: 1 pound of nitrogen, 2 pounds of phosphorus in the form of phosphate (P_2O_5), and 2 pounds of potassium in the form of potash (K_2O) per 1000 square feet of garden area. Let's use this rule to calculate how much fertilizer to add to your garden.

As you look at the fertilizers in your garden supply store, you notice that each package is labeled with three numbers. These numbers are important to our calculations. What do they mean?

By law each bag of fertilizer must, at a minimum, tell you how much nitrogen, phosphate, and potash it contains as percentages by weight. You might think of this as being equivalent to the nutrition labels required to be printed on packages of food for people. Only these are nutrients for plants.

A "balanced" fertilizer is one where the three numbers are approximately equal, such as 10-10-10. This would indicate that the fertilizer contains by weight 10 percent each of nitrogen, phosphate, and potash. Since these three numbers only add up to 30

(Continued on page 2)

Inside this issue:

College of Agriculture and Life Sciences
Cooperative Extension
Cochise County

Cochise County Cooperative Extension
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(Continued from page 1)

percent of the weight, the other 70 percent of the weight is "other stuff," mostly inert fillers.

After reading the labels and checking the prices you purchase a 50 pound bag of 5-10-10 fertilizer that was on sale. It turns out that you have accidentally bought a fertilizer that has exactly the correct ratio of nutrients for your needs. The rule of thumb said to add nitrogen, phosphorus, and potash in the ratio of 1 pound : 2 pounds : 2 pounds, respectively, and your 5-10-10 fertilizer has exactly those ratios. How clever you are! Now it's time to figure out how much of the fertilizer to use.

The first step is to calculate how many square feet you have in your garden. That's not too difficult. Just multiply the length by the width of your garden. In your case, 25 feet X 15 feet = 375 square feet, assuming of course that your garden is rectangular.

The second step is to figure out how much nitrogen is required for your 375 square foot garden. Since your garden is smaller than 1000 square feet, it will require less than 1 pound of nitrogen. To figure out how much less, you need to divide the area of your garden (375 square feet) by 1000 square feet. The result is 0.375. If your garden is only 0.375 the size of a 1000 square foot area, then it will need only 0.375 X 1 pounds of nitrogen. This is about 0.4 of a pound.

The third and final step is to figure out how much of the 5-10-10 fertilizer will contain the 0.4 pounds of nitrogen you need. Since you know that 100 pounds of the fertilizer contains 5 pounds of nitrogen (5 percent of 100), you will need to apply something less than 100 pounds to your garden. To determine exactly how much less, divide 0.4 pounds by 5 pounds. The answer, 0.08, tells you what fraction of 100 pounds to apply. In this case, 0.08 X 100 pounds = 8 pounds.

If you would like to see more examples of how to calculate fertilizer amounts, check out the Arizona Master Gardener Manual at:
http://ag.arizona.edu/pubs/garden/mg/soils/fertilizers.html

Until next time, happy surfing.

Gary A. Gruenhagen, Master Gardener
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High Desert Gardening & Landscaping Conference

High on the Desert

February 14 & 15, 2013
Plan now to attend!!!

Click here to go to a web page with all the information on the conference including the program and registration form.

Master Gardener

Cochise County Master Gardener
Newsletter Editor
Carolyn Gruenhagen

Cuttings 'N' Clippings

❄ The **Thursday, February 7** CCMGA meeting speaker will be Dr. Dawn Gouge, professor of Urban Entomology at UA. The title of her presentation is *"Keeping the Bugs Out—sleep tight and don't let the bed bugs bite!"* The location is the Public Meeting Room at UASV and the time is 5:00 p.m. For information call (520) 458-8278, Ext 2141 or contact Joyce at:
jwilliam@ag.arizona.edu/

❄ The next **FREE** Water Wise workshop is scheduled for **Saturday, February 2** from 9:00 to 10:30 a.m. and it will be *Harvest Rain!* This presentation will show you how to put together a catchment system from roof to irrigation. Keeping the water clean, gravity fed and pressurizing for irrigation will be some of the many topics covered. **Rain-barrel door prize!** The location is the Public Meeting Room at UASV. For information call (520) 458-8278, Ext 2141 or contact Joyce at:
jwilliam@ag.arizona.edu/

❄ **Rose Pruning Demo**
A free workshop will be given **Saturday, February 16** from 2:00—4:00 p.m. by Cochise County Master Gardeners. The location is the UA Sierra Vista Rose Garden, 1140 N. Colombo, Sierra Vista. Bring your pruners and practice what you learn!

❄ A new Master Gardener class begins February 26. For information call 458-8278, Ext 2141 or contact Joyce at:
jwilliam@ag.arizona.edu/

To Be (Green) or Not To Be (Green) - Part 2

In and of themselves, of course, the elements in synthetic fertilizers are in no real sense synthetic. They are in existence already. We're just reclaiming them from the earth or the atmosphere and repackaging them. A plant can't tell one nitrogen molecule from another, no matter its source. I have used synthetic fertilizers because my soils were lacking nitrogen, but now that my soils have adequate organic material incorporated, my preference for maintaining my garden is to use organic materials to build soil and feed my plants. I suspect that soil health, and thus plant nutrition, is more complex than simply adding N, P, and K from a bag. Manures and compost feed the soil, too, and if not recycled into life giving fertilizer, manures can become toxic waste themselves. Why not use them to garden?

There is more to the use of fertilizers than the "chemical" aspect. If organic matter isn't routinely returned to the earth, soil breaks down. It becomes less full of life and more susceptible to erosion. An article by University of Washington geomorphologist Dr. David R Montgomery in the October 15, 2012 edition of the *Wall Street Journal* noted "Islands of unplowed prairie in pioneer cemeteries across the American heartland stand higher than the surrounding eroded fields." Iowa's spectacular soils are now in the Gulf of Mexico in part due to poor farming techniques.

What about pesticides? I tend to be pretty conservative here. Both organic and conventional pesticides can be dangerous, especially if misapplied. **ALWAYS read and follow label directions carefully no matter what pesticide you select.** Think about it. The purpose of both is to kill life. Neither one is, strictly speaking, safe. No doubt pesticides in this day and age are well studied and understood with respect to acute toxicity and corresponding doses. Not so well understood are long term exposures to very low doses. To use an analogy, tobacco use appears safe when delivered at the low levels found in cigarettes, but now we all know its long term effects can be lethal. We haven't used most pesticides for 60 or 70 years, at most, and probably have much to learn about their effects.

Accordingly, then, my insecticide use is minimal, so far being limited to insecticidal soap, which I rarely need to use. The grasshoppers of late summer being a flagrant exception, as well as one for which soap is insufficient. As for herbicides, I tend toward hand weeding and the use of a flame weeder. Note that flame weeders use propane and are therefore not especially clean nor renewable, but they aren't toxic to my soil. (They can be dangerous. Believe me, it's very easy to start a fire with one!) A trip around my garden in late summer will also reveal that I sometimes practice a form of neglect regarding weeds as well. It's laziness, not a clever scheme on my part. Neglect does not do much to reduce weeds! I did use glyphosate this spring when some Bermuda grass appeared in the garden (likely brought in, ironically, with a load of compost). Bermuda grass is nearly impossible to eradicate with organic techniques, so I reluctantly elected to "go chemical." Thankfully, it appears to have worked.

Pesticide use and its drawbacks are more and more the subjects of scientific study. A recent paper published by the American Academy of Pediatrics (the eight page policy statement which is available here: **http://www.whyy.org/91FM/images/ybyg20121215_pesticideexposure.pdf.)** makes clear that chronic low level exposure is a problem for young children. In the words of the statement: "Epidemiologic evidence demonstrates associations between early life exposure to pesticides and pediatric cancers, decreased cognitive function, and behavioral problems. Related animal toxicology studies provide supportive biological plausibility for these findings." Chronic exposure to low levels of pesticides is thought to be a contributor to the decline of honey bees, though this is not yet proven.

Science is the only tool we have to resolve the questions surrounding this debate and a good amount of science has been done in this regard already. Unfortunately, much more studying needs to be done. Conducting valid experiments, especially with regard to chronic exposure, is very difficult because there are so many variables and unseen conditions.

Modern agriculture has accomplished remarkable feats, most significantly in feeding a world of roughly seven billion people. Nonetheless, on my little portion of paradise, I will stay as "organic" as possible and reasonable. A definitive answer as to the long term safety of many pesticides isn't coming in my lifetime and I can see no harm whatsoever in an organic approach.

I hope to see you at the Conference on February 14 and 15!

Bill Schulze, Master Gardener
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Thomas Robert Malthus:
Was He Right or Wrong? Part 1

In the late 18th Century, Thomas Robert Malthus published his essay on the *Principle of Population* stating that man could not feasibly produce food as fast as we could reproduce and therefore we would be subject to such miseries as poverty, famine, and disease. This essay stirred up so much controversy that over 200 years later we are still debating whether he was right. Supporters of Malthus's statements argue that unless we cease to populate we are destined to destroy ourselves while those in opposition to Malthus claim that it is not too many people but too few people we need to be concerned with. The question is: Was Thomas Robert Malthus right or wrong?

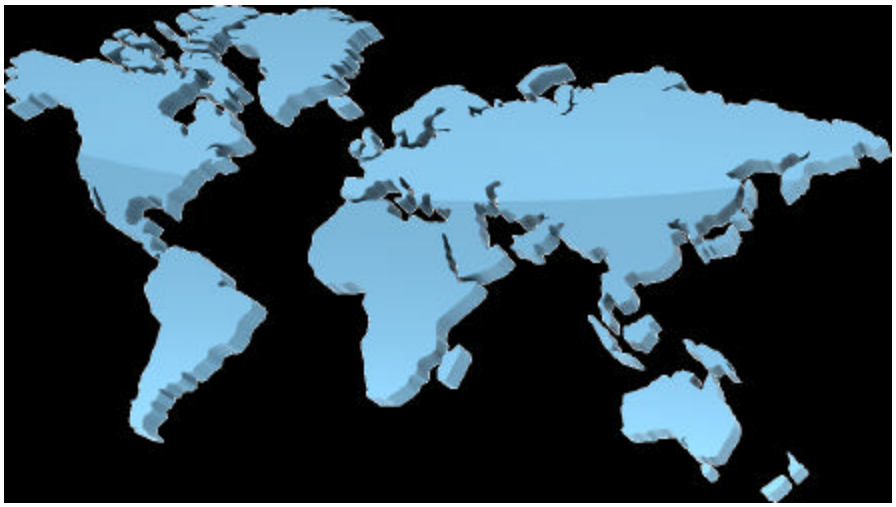
For this article let us assume that he was wrong, or at least that his timing was off. Today with slightly over 7 billion people in the world, most are able to feed themselves and their families and afford a cell phone, television, or computer. Malthus simply underestimated the resourcefulness of humans. More humans does mean more mouths to feed and more land for housing, thereby resulting in less farmable land. However, more people also means more resourcefulness, more education, more experience, and more technology. During Malthus's time industrial technology was just beginning. As time went on more and more people learned how things worked and improved upon them. With the use of computers today we are able to generate even more ways to produce additional food and usable products. Modern day farmers have computers to alert them to mishaps in their vegetable growing. One only needs to visit the greenhouses in Willcox to learn how computers are used to regulate the amount of CO_2 tomatoes get in order to improve their yield. Computers are also used to alert farmers to freezing temperatures so they can take measures to ensure that their crops do not freeze.

Malthus also did not understand the concept of our agricultural zones. There are many places on Earth that can grow food year round. Easy and cheap transportation did not exist in his day either. Malthus did not take into consideration the idea that food could be grown in one part of the country (or world) that has a year round growing season and then be transported to other places quickly. In Malthus's day food was grown during the local growing season and then stored for the winter months. One could possibly trade surplus with another place, but not nearly to the extent that can be done now. Today we can go to our local supermarket and buy any food from any part of the world all year round.

Another fact that Malthus did not predict was our ability to control human reproduction. Today we are able to decide how many children we bear through the use of fertility treatments, fertility monitors, and birth control. Whether you approve of these methods or not, one cannot deny the fact that they have had a huge impact on our population rates. The decreasing yearly death rate also has an effect on our population. With the improved nutritional value of our food, improved shelf life of that food, and better medical care, fewer and fewer people are falling fatally ill before old age.

Up Next: Part 2: In what ways was Malthus right?

Stephanie Blanchette
Master Gardener



Should I Add Wood Ash to Soil?

Question: In the Eastern United States, people put wood ash on their gardens – will it help or hurt my garden in the Southern Arizona?

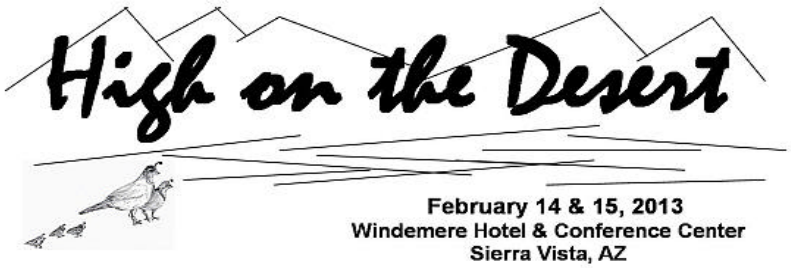
Answer: Wood ash is a source of phosphorus (P_2O_3) and potassium (K_2O) which are essential plant nutrients. The second and third numbers on a fertilizer bag indicates the percentage of P_2O_3 and K_2O in the bag. Our desert soils usually have adequate native amounts of potassium but need additional phosphorus. Another reason wood ash is placed in the soil is to increase the pH of the soil. Wood ash has pH in the range of 8 to 12, and is usually twice as potent as lime for lowering soil pH. In the East, because of higher precipitation amounts, soils are naturally acid; pH is below neutral 7. Ideal garden soil pH is 6.8 or nearly neutral. Our desert soils generally have a pH range from 7.5 to 8.5. We want to acidify our soils rather than try to make them more alkaline. Therefore, wood ash is not recommended as a soil amendment in the arid West. A small amount of wood ash applied in the garden will probably not hurt the soil and crops to be grown there, but DO NOT apply wood ash in the future.

(Note: Reprinted from the February 1994 Cochise County Master Gardener Newsletter written by Robert E. Call, Horticulture Agent.)

There's still time to register!!!

Cochise County Master Gardeners Association in conjunction with
The University of Arizona Cooperative Extension presents . . .

the 20th annual
High Desert Gardening & Landscaping Conference



February 14 & 15, 2013
Windemere Hotel & Conference Center
Sierra Vista, AZ

An educational experience for everyone with an interest in gardening. ❀ For information contact U of A Cooperative Extension ❀ 1140 N. Colombo ❀ Sierra Vista, AZ (520) 458-8278, Ext. 2141 www.ag.arizona.edu/cochise/mg/ ❀ Registration and fee required for conference ❀

Did You Know . . .

- When the University of Arizona (Tucson) opened its doors in 1891, there were only two colleges (Agriculture and Mines), six faculty and 32 students.
- In 1912, the University celebrated Arizona becoming a state 27 years after the UA's designation as a University.

  -*125 Fun Facts, The University of Arizona*

- Ground breaking for the new University of Arizona Extended University Campus next to Cochise Community College in Sierra Vista was slated for May 7, 1992. Construction was scheduled to be completed in early 1993.

  -Reprinted from March 1992 MGNL

- In January 2013 the name of the campus in Sierra Vista was changed from University of Arizona South (UAS) to University of Arizona Sierra Vista (UASV).

  -Sierra Vista Herald

February Reminders

- Winter prune
- Prune roses
- Cold-moist stratify seeds
- Plant bare-root trees
- Prepare spring planting beds
- Clean and repair drip irrigation systems
- Finalize spring garden plans
- Keep watering!

In a Desert Garden

Wild Zinnias

These little beauties have been growing on my property long before I arrived and the house was built. They are growing in my front yard, the ones in my back yard have long left due to the irrigation that area receives from time to time. These plants are natives and are best left alone as they are tough and cannot survive with too much water outside the rainy season. I have both varieties that grow in this area, *Zinnia acerosa* and *Zinnia grandiflora.* These Zinnias are perennials, short-lived, but as they self-seed, I have them pop up since I live in Sierra Vista. These plants are petite and dainty looking with papery little flowers. *Zinnia acerosa* or Desert Zinnia has white flowers with brownish yellow centers, *Zinnia grandiflora* or Prairie Zinnia, has yellow flowers with orange centers. These daisy-like flowers bloom from spring until fall. I wonder why they are not available in the nursery trade as a mass planting would make a great groundcover. These zinnias are loved by butterflies and bees, but are not eaten by deer and rabbits. Both species form neat little clumps with small needle-like leaves.

Angel Rutherford. Master Gardener Photographer

Zinnia acerosa

Zinnia grandiflora