Msg : 30 of 30 - 21
 From : Helen Fleischer 1:109/426 Sun 20 Dec 92 20:40
 To   : Mary Bolack
 Subj : COMPOST TEA

NO violets around here to test anything on, I'm afraid. I never did have much luck with them, except with the ones that are taking over my back yard. I have never managed to burn anything with the worm "coffee" even at 50/50 strength, but I'd love to get a more clear idea of the strength and content of the stuff. I got into worm bins a couple years ago after reading an article in Garbage magazine. This is the third style of bin I've devised for myself (I refuse to pay big bucks for a ready-made one) and it is the handiest yet. I used an inexpensive laundry sink this time. I stuffed the drain with netting material and placed a 2 gallon wide-mouth jug from clumping cat litter on a box so that it come up just the right height to fit loosely around the drain. that allows air flow as well ans drainage. The tub also has a layer of corn cob litter in the bottom for drainage help (cats never took to that stuff so I had a lot left from the 40 lb bag). The main bedding for the worms is a mix of rabbit manure and sawdust, with occasional addtions of shredded cardboard and paper, because the worms like it. In that I bury whatever kitchen waste I wish to compost and add a bit of ground limestone from time to time. The worms don't like things to get to acidic, so the pH is pretty neutral. Just judging by what goes in, ther should be a decent balance of N,P,K, but how much??? Tis a puzzlement. By the way, if you plan to build a bin yourself, I also need to mention the lid. It keeps the worms in and the flies out, more or less. Fly control is something one needs to be vigilant about, and worms can be killed by sprays so controls need to be extra cautious. Pyrethrins are out of the question, for instance, and I found that even the BT that controls fungus gnats causes a drop inthe worm population. Sticky traps and beer traps are the safest and quite effective for the fungus gnats and fruit flies that have been the only problems so far.
--- TBBS v2.1/NM
 * Origin: The Coffee Club BBS: 301-353-9315, Germantown, MD (1:109/426)

Subj : SQ. FT. FERTILIZING

Well you asked for it. Over the next few weeks, whenever I have a chance I'll post as much information as I can on fertilizing. Forgive me if I'm too basic but I'm going to come from the assumption that you know nothing, just incase there are people who really don't. I'll get into soil testing and how to read the results in a later post.

1. The 3 numbers on a fertilizer bag stand for the precent by weight of nitrogen; phosphorus (P2O5); and potassium (K2O). Since 1950 efforts have been made to make conversion from oxide to elemental forms of phosphrous and potassium, but customs are hard to change. The numbers on the bag, therefore, need to be converted in order to know exactly how much nutrient carrier there is.

Carrier		Elemental
N	=	N
P2O5 * .44	=	P
K2O * .83	=	K

So for example if you wanted to know the amount of elemental nutrients in 1 ton of 10-15-20 fertilizer:

1 ton = 2000lbs.

.1 * 2000 = 200 lbs of N = 200 lbs of N
.15 * 2000 = 300 lbs of K2O5 = 300 * .44 = 132 lbs P
.20 * 2000 = 400 lbs of K2O = 400 * .83 = 332 lbs K

Now say your soil test comes back and quadrant "D" (more later) has 66 lbs/acre of "available" nitrogen. For good growth for the particular crop we are growing there we need 150 lbs/acre. Hence we need to add the equivilent of 84 lbs/acre of nitrogen. Our major source of nitrogen is cottenseed meal which is 7% nitrogen by weight. We need to calculate how much cottonseed meal we need to

add to each bed. The size of the beds are say... 4' X 50' or 200 square feet (sq').

1 acre = 43,560 sq' (say 40,000 sq' for convience since this is not an exact science).

So, 1 bed is 200/40,000 = 0.005 = .5% (one-half of one percent of one acre).

Amount of cotten seed per acre:

Now we have a fertilizer that is 7% nitrogen and we need 84 lbs/acre. In other words 7% of some amount of cottonseed meal ("x" amount) is equal to 84 lbs (per acre). OR:

.07 times xlbs/acre = 84 lbs/acre Nitrogen OR:

.07x = 84   or x = 84/.07 or 1200 lbs.

Final Step is to calculate how many pounds per bed:

1200 lbs cottonseed meal per acre times .005 acres = 6 lbs cottonseed meal per bed.

If you don't get the math have someone explain it to you.

Soil testing needs to be done at least once a year ususally in the spring. When a soil test is done in the fall you may get a false reading, for the soil will be much warmer and there for chemical reactions take place at a higher rate. A rule of thumb for this is that for every 10 deg celcius rise in temperature, biological and chemical reactions double. Therefore you would like to get your test done in the spring when less nutrients are available to the plants, remebering that more nutrients will be available in the fall. like I have said

before, fertilizing is more art than exact science.

There are several labratories that do soil testing (maybe we could get Cissy to post a national list), and each gives there results in a different way usually depending upon how much cash you send them. The cheapest will send you a read out in pounds of the following available nutrients per acre furrow slice (one acre 6" deep, which is equivilent to the acre measurement used in the calculations above) :

pH value, units: (for most crops should be between 6.8 and 7.1 more later)
Organic Matter: (2% and up although most plants thrive when it is around 6%)

Ammonia Nitrogen: (should be between 50 to 100)
Nitrate Nitrogen: (30 to 50 will explain the differences later)
Total Available Nitrogen: (should be between 80 and 150 depending on the crop)

Phosphorus: (can be elemental or carrier depending on the company - 150 and up)
Potassium : (" 350 and up)
Calcium: (2000 and up)

Magnesium: (100 and up)
Manganese: (1 to 5)
Sulfate (SO4): (250 and up):

Chloride: (100 or less)
Sodium: (300 or less)

You may also get a report on micronutrients and Cation exchange capacity.

Essential Plant Elements and Their Sources

Nutrients used in LARGE amounts Nutrients used in SMALL amounts

(macronutrients)

Mostly from Air and Water:

Carbon
Hydrogen
Oxygen
Nitrogen

From Soil Solids:

Nitrogen
Phosphorous
Potassium

Calcium
Magnesium
Sulfur

From Soil Solids:

Iron
Mangenese
Boron
Molybdenum
Copper
Zinc
Chlorine
Cobolt

> Can you post more about the horse manure tea? Why use
> it instead of straight manure, how to make it, etc.

> We are REAL new at growing things, but have had pretty
> good success with snow-peas so far. Lots of 'em.

Congradulations on your success! Snow peas are one of my favorites.

As far as manure tea goes....

Although I said horse manure it really can be any kind of manure. It's great to use chicken waste as it is generally too hot to put directly on your garden.

Fill up a big potatoe (for you D.Q.) sack (or any other kind of sack you happen to have), with manure. Place a 2X4 across a 55 gallon drum and suspend the bag

into the barrel. Fill with water. In a couple of days you'll have manure tea.
Always stir for it does settle.

Use it on starts, where any other fertilizer would be to strong. Use it to give
a little extra boost during flowering and fruiting periods. It helps but it
doesn't overwhelm the plant with nitrogen forcing it back into it's vegetative
cycle. I water with it once or twice a week in the greenhouse.

F R E E F E R T I L I Z E R

Would you like to have homemade fertilizer? It's free and YOU control what goes into it. What's more it reduces kitchen leftovers!!

HOW TO DO IT.

Put your kitchen & table scraps (except bones & meat fat) in a food processor/blender. If you have a heavy duty machine (like a Vita-Mix), you may be able to get away with using small chicken bones (this adds more trace elements to the mixture). Fill the container no more than 2/3 full. Add just enough water to cover the scraps. Grind to desired coarseness or fineness. If you already have a compost pile, add this "liquified" compost to it. If not, just pour it directly in your garden/flower bed.

HOW DOES IT WORK?

Using pureed garbage in the soil is a type of slow ("cold") composting. This produces more micro-organisms (which are important for healthy soil) and retains more nutrients compared to fast "hot" composting. While it is true that "hot" composting kills weed seeds, there are no such seeds in leftovers. Of course, more nutrients mean

healthy, more vigorous plants and better harvests. HAPPY
GROWING!!
Ä [16] SUST_AG (9:1992/111) ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ECHOMAIL015 Ä
Msg : 44 of 47 - 37
From : Lawrence London   1:151/502   Tue 09 Feb 93 21:34
To   : Gary Faucett
Subj : Sq. Ft. Fertilizing
ÄÄ

> What is the best fertilizer for the square foot garden? I use a
> lot
> of compost, but I need something that will give the plants more
> nutrients. I'd like to stay organic if possible.

Use rock or colloidal phosphate, New Jersey Greensand, granite screenings
(dust), granulated seaweed, fish emulsion, any other
rock powders available from quarries or Fertrell or ERTH-RITE fertilizers.

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* Origin: EARTH*Net-Host:SUSTAINABLE AGRICULTURE Echo-9199335957 (1:151/502)

> Sorry I've been abit quiet, I have just spent a number of days out
> at our research site. I installed a BBS out there and soon hope to
> encourage local farmers to participate in the activities that we
> offer.

Great show! Looking forward to communicating with them. Are any of them
vegetable/fruit growers?
Did you install RA under FD with TosScan? Of course you did. :-)

> I see sust_ag has been rather busy while I have been away, but in
> future I will be able to participate from our research site. We
> meet with out field managers every month to review our broad acre

> management programs and activities.

I'm sure they will find interesting subjects for discussion in this conference. Hope so anyway.

> We have about 1,600 acres under our care and our next trials span
> only a small 10 acres. These new trials will expand my horizons
> and knowledge, and I am keen to see sustainable agricultural
> methods in practice. Our government is now pushing hard for
> minimun till, sustainable methods.

Needless to say I am keenly interested in vegetable production and would like to learn from the research you are doing. The underground micropore irrigation could be easily adapted to my farm and would be very effective. A main advantage would be reduction of water loss through evaporation. Reducing the time the well pump has to run and the load on the aquifer would be highly desirable. My 2hp pump would cost well over
$1000 to replace. Purging the pipes with air prior to irrigating with a very dilute mixture of any combination of fish emulsion/liquid seaweed/manure tea/compost tea with water should produce fantastic results. My soil is very well drained, well aerated red-colored Georgeville silt loam and would respond well to this system of irrigation/fertilization.

Any input from you on this would be welcome, i.e. the equipment needed for the system: micropore pipes, liquid pump/air pump, monitoring equipment, moisture sensors, etc.

FERTILIZING DECIDUOUS SHADE TREES IN THE LANDSCAPE

M.A. (Kim) Powell
Extension Horticultural Specialist

April 1990 LEAFLET NO. 618

Shade trees, like any other landscape plants, will respond to fertilization. Most shade trees exist in nature without much care, but transplanting trees into urban areas or man-made conditions can create problems. Often these trees will be growing in restricted root zone areas, be surrounded by pavement or compacted soil or even be physically damaged by construction activities. One should realize that the root system is just as important (and delicate) as the above ground parts. Fertilizer will not improve the health of a tree stressed by one of these environmental conditions. Fertilizer is only one factor in the complex formula of plant requirements. The following are general recommendations for the timing, methods and rates of applying fertilizer to shade trees.

One should be able to detect when a tree needs fertilizing. Symptoms of a nutrient deficient tree include a slow rate and low amount of annual growth on twigs and trunk, smaller than normal foliage, off-color foliage, increased amounts of dead branches, tip-die back in branches, and increased rates of disease and insect problems. Trees that possess these symptoms generally would respond to a fertilization treatment. One should make sure that nutrients (or lack of) are the problem before fertilizing. Other common tree disorders to be aware of in urban areas would include poor planting techniques, moisture problems, construction damage, girdling roots, or utility leaks from a natural gas line or sewer line. Soil testing is highly recommended in questionable situations.

Soil Testing. Before selecting a fertilizer take a soil test. Take several soil samples from the area, 6-8 inches deep using a soil sampling tube. Cores should be collected in a clean pail and mixed thoroughly. A soil test will reveal what situations exist and give a recommendations for adjusting nutrient levels.

Soil pH should be considered also. Generally a pH range of 5.2-6.2 is the most desirable. More acid soils should be limed to raise the pH while more basic soils should be treated with sulfur to adjust the pH downward. Maintaining a soil pH range of 5.2-6.2 for shade trees generally insures that the availability of essential plant nutrients will be available to the tree.

Fertilizer Types. When selecting a fertilizer, purchase a high nitrogen level fertilizer. Nitrogen is a principal plant nutrient, and is important in production and maintenance of color in the foliage. Using the proper amount is important since overdoses can result in root injury while lack of nitrogen may result in poor vegetative growth.

Ratio of nitrogen to the other two major nutrients, phosphorus and potassium, should be approximately two or three times higher. Fertilizers which can be used include 10-5-5, 12-6-6, and 18-6-12. Several of these fertilizers contain both the urea formaldehyde and nitrate form of nitrogen, which allows for smaller amounts of nitrogen to be released over a longer period.

Root disorders caused by soil compaction, construction damage, or drought, can be corrected by using fertilizers high in phosphorus which will promote new root growth. Superphosphate (0-20-0) or triple superphosphate (0-46-0) are recommended. High nitrogen fertilizers, particularly fast release forms, should be avoided because the resulting increased top growth will strain the already inadequate root system.

When to Fertilize. Normally, shade trees should be fertilized only enough to keep them healthy. In heavy soils or soils

underlain by a hardpan, too frequent or too heavy fertilization may cause nutrients to build up to toxic levels. This may be avoided by periodic soil testing which will show abnormally high or low nutrient levels. Newly planted trees can be fertilized annually to induce growth, but an established tree may not need fertilizer but once every 5 years.

Usually, October through November and March through May are the best times to fertilize. Soil moisture and temperature conditions are best during these periods, and this will insure that the fertilizer will be in place at the beginning of the growing season when maximum benefit will be realized. Late summer fertilization may promote late growth which is undesirable before winter.

Distressed trees should be fertilized at once. Stress problems will normally show up during the active growing season. Root damaged trees should be fertilized during periods of maximum root growth which occur during spring, early summer and in early to mid autumn.

Where to Apply Fertilizer. Fertilizer must be placed near the tree's feeding roots. The feeding roots begin several feet from the trunk and can extend beyond the spread of outermost branches by as much as 40-50%. Shallow rooted species such as elm or maple typically have roots that extend well beyond the spread of the branches. In such cases, extend the area fertilized to match the estimated root spread.

Application Methods. The method selected will depend on the plant cover under the tree, soil conditions, and amount of time

and labor available to fertilize the tree. Several common home methods are discussed below.

1) Drill Hole - Holes are drilled or punched in the soil in the area to be fertilized. An auger, punch bar, or crowbar is used to make slightly slanted holes 12 to 15 inches deep spaced about 3 feet apart. The recommended amount of fertilizer should then be distributed evenly among the holes. It is recommended to mix the fertilizer with peat moss, pine bark, or gravel to backfill the holes. A funnel and a small can as a measuring device can be used to place the fertilizer/backfill into the holes. This technique has the advantage of aerating the soil as well as placing the fertilizer in close contact with the feeder roots.

2) Feeding Needles - Several types of "needles" are available which inject liquid fertilizer solutions into soil. The addition of fertilizer in solution adds moisture to the soil, provides nutrients almost immediately since nutrients must be in solution before roots can absorb them, and provides more even distribution. Several types of liquid feeding needles are available commercially. In most types, a plant food cartridge is placed in a chamber and water is supplied by a garden hose in the ground at the proper depth. Needles do not work well in heavy soils at normal home water pressures. Avoid high nitrogen, fast release plant food cartridges for root damaged trees.

3) Surface - The simplest and fastest way to apply fertilizer is to spread it on the lawn or soil surface under the branch spread. (Many horticulturists believe this method to be just as effective.) To prevent lawn or groundcover damage, the fertilizer should be applied in split applications with thorough watering after each application. One application of

the recommended amount followed by thorough watering is sufficient on bare soil areas. Phosphorus, and to a lesser extent potassium, do not move well through soil; therefore, the fertilizer should be tilled or watered in, thoroughly. Frequently, surface fed trees develop shallow (sometimes above ground) root systems which interfere with mowing, adversely affect grass growth, and make the tree more drought susceptible.

Application Rates for Deciduous Trees. The rate of application will vary with the size of the tree. Two methods of determining fertilizer rates are commonly used for deciduous trees.

1) Diameter of Trunk - Apply 3-5 pounds of 10-6-4 (or similar analysis fertilizer) for each inch of trunk diameter measured at 4 1/2 feet above ground. For example, a 10 inch diameter tree required 30 to 50 pounds of 10-6-4 fertilizer. Diameters can be found by the following formula:

   Diameter = circumference x .318

   *(This method is not recommended if the root zone area is restricted by curbs, paving, etc.)

2) Crown Spread Area - Apply 5-6 pounds of actual nitrogen per 1000 square feet of soil surface area under the spread of the branches (crown spread). Crown spread can be determined by the following formula. The radius is the distance from the trunk of the tree to the edge of the branch spread.

   Crown Spread = (Radius) 2 x 3.14

   Example: if a tree has a crown radius of 18 feet, crown

spread = 18 x 18 x 3.14 = 1017 square feet. The recommended rate would be 50 pounds of 10-6-4 fertilizer (10% nitrogen, 6% phosphorus, 4% potassium).

For trees less than 8 inches in trunk diameter, use 1/2 the above recommended rates. If the surface area beneath the crown spread of tree is obstructed (as by sidewalk, driveway, or street), reduce application rate by the approximate percent that the obstruction covers the soil surface area under the spread of the branches.

Application Rate for Evergreen Trees. Rates for evergreen trees with over a 10 inch diameter can be calculated the same as for deciduous trees. For evergreens between 4 and 10 inches in diameter, use 1/2 the rate recommended for deciduous trees of the same size. For evergreens between 1 and 4 inches in diameter, use 1/2 pound fertilizer per foot in height or 6 to 8 pounds of fertilizer per 100 square feet of crown area (assuming a 10-6-4) or similar fertilizer is used).

Application Rate for Root Disorders. Apply 3 pounds superphosphate (0-20-0) or 1 1/2 pounds triple superphosphate (0-46-0) per each inch of trunk diameter. Professional advice should be obtained, if the tree does not respond to one application, before applying a second dose of fertilizer.

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