

Fertilizing Deciduous Fruit Trees: start to finish
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I. Scope

- Deciduous Fruit Trees, including:
 - Fig
 - Pit (Apricot, Peach, Plum, ...)
 - Pome (Apple, Pear, ...)
- Some Deciduous fruiting vines, including:
 - Grape (Vitis species)
- Not recommended for many evergreen fruiting trees nor many deciduous berries.

II. Organic and non-Organic Fertilizers

- Just because a fertilizer label says “Organic” does not mean it meets U.S. NOP standards.
- Likewise, a label without the U.S. NOP insignia might or might not meet U.S. NOP standards.
- An OMRI label means that the manufacturer paid an exorbitant price to certify that they sort-of meet the NOP standard.
- For fertilizers, a standard reason for disqualification is the presence of nitrate compounds or EDxx chelates. A calcium fertilizer supplement containing Calcium Nitrate is not “organic” by current NOP standards.
- Whether to use “organic” or “non-organic” fertilizer is a personal choice. I personally choose what is best for the plant, the local environment, and the consumer of fruits. Sometimes this means “organic” and other times it does not. Dosage plays a key role in this decision.

III. Soil / Growing Media Notes

- Choice of growing media depends upon the environment chosen for growing plants. Each environment has one or two best practices along with many poor choices propelled by urban myths and advertising -- both overt and subvert (e.g.; magazine articles written and paid for by an advertiser, commercial bloggers on a forum).
- Soil made from scratch. Here is what I use, fractions are of total volume:
 - about 1/2 Horticultural Sand^{hs}
 - about 1/3 Ground Sphagnum Peat moss -- or -- Triple Ground Redwood Bark
 - about 1/6 Composted Green Waste^{cgw}
 - about 1% Fresh Worm Castings^{wc} with worm eggs as an inoculant
- Calcium: If your choice of growing media does not or cannot include Calcium then a fertilizer supplement might be needed from time-to-time. If you are using municipal water then Calcium is likely present -- so no need for a supplement.

IV. Watering Plants potted in Media

- Water thoroughly when the media is at the bottom of the “Moist” range. Drain thoroughly. After draining, place a drip pan under pots if necessary.
- Allowing potted plants to sit in water for an extended duration is a poor practice in most environments.

V. Fertilization When Rooting Cuttings

For information on Propagating cuttings, see [“Plant Propagation, ed. Alan Toogood”](#):

1. In soil or growing media (the standard approach)
 - a. Soak the soil or media in a general purpose growth hormone. See label for dosage.
 - i. Organic - Seaweed Extract^{se}
 - ii. non-Organic - Grow More Jump Start^{is}
 - b. Allow soil or media to drain
 - c. Before placing cutting in soil or media
 - i. Organic: Soak cutting up to at least one or two nodes in Seaweed Extract^{se} solution for about 5 minutes. See label for dosage.
 - ii. non-Organic
 - Dip bottom ~1.5” of cutting in filtered water^{fw}
 - Dip wet portion of cutting in I3B rooting powder and tap off extra powder
 - d. Place cutting in pre-made hole in soil or media
 - e. Provide container with bottom heat of 70°-75°F unless permanently outdoors in temperate environment.
 - f. Water with filtered water^{fw} when soil or media is less than moist
 - g. A week after shoots have emerged, add to irrigation water
 - i. Organic: liquid fish emulsion^{fe} at 1/8 listed dosage
 - ii. non-Organic: 20-10-20 water soluble²¹ or 9-3-6 Foliage Pro® liquid⁹ at 1/8 listed dosage
 - h. Continue until potted plant moved to next growing environment
2. In a translucent bag, e.g. fig pop (not recommended for novice propagation)
 - a. Before placing in bag
 - i. Organic: Soak cutting up to at least one or two nodes in Seaweed Extract^{se} solution for about 5 minutes. See label for dosage.
 - ii. non-Organic
 - Dip cutting in filtered water^{fw}
 - Dust lightly with I3B rooting powder and let sit for 5 minutes
 - Lightly wipe off powder with tissue
 - b. Place in bag
 - c. Spray mist with filtered water^{fw} infrequently until roots begin to emerge
 - d. When roots begin to emerge, add to infrequent spray mist
 - i. Organic: liquid fish emulsion^{fe} at 1/8 listed dosage
 - ii. non-Organic: 20-10-20 water soluble²¹ or 9-3-6 Foliage Pro® liquid⁹ at 1/8 listed dosage
 - e. Continue until potted plant moved from bag to next growing environment

VI. Fertilizing Juvenile Trees

Follow this regime until plants begin to mature in size and development, typically through at least two winters. Choose ONE of the following. Consult product labels for dosages appropriate to your desired feeding frequency.

1. Organic
 - a. Liquid
 - Take 1 gallon of Fish Emulsion^{fe} and add 1.5 cups (1.2 lbs, 534g) of Sul-Po-Mag^{spm}. Shake mixture and let stand with cap off for 12 hours before 1st use.
 - Shake prior to use. Follow Fish Emulsion label for dosages. Use liquid only - not granules.
 - b. Granular
 - Use Organic All-Purpose 5-5-5 Fertilizer
2. non-Organic
 - a. Water Soluble. Choose one of the following
 - 20-6-16 foliage formula²⁶
 - Foliage Pro® 9-3-6 liquid⁹
 - 20-10-20²¹
 - b. Granular
 - Use Granular 8-6-8 with micros

VII. Fertilizing Maturing Trees for Fruit Production

Choose ONE of the following. Consult product labels for dosages appropriate to your desired feeding frequency.

1. Organic
 - a. Liquid
 - Take 1 gallon of Fish Emulsion^{fe} and add 2.5 cups (2 lbs, 890g) of Sul-Po-Mag^{spm}. Shake mixture and let stand with cap off for 12 hours before 1st use.
 - Shake prior to use. Follow Fish Emulsion label for dosages. Use liquid only - not granules.
 - b. Granular
 - Use Organic All-Purpose 5-5-5 Fertilizer, plus supplemental Sul-Po-Mag
2. non-Organic
 - a. Water Soluble
 - Use [16-8-24 Fruit Fuel](#)^{ff}
 - b. Granular
 - Use Granular 8-6-8 with micros, plus supplemental Sul-Po-Mag

XXX. Appendix

- ^{ff}16-8-24 Fruit Fuel

GUARANTEED ANALYSIS		FRUIT FUEL	
Total Nitrogen (N).....	16.00%	Boron (B).....	0.02%
4.4% Ammoniacal Nitrogen		Copper (Cu).....	0.05%
6.4% Nitrate Nitrogen		0.05% Chelated copper	
5.2% Urea Nitrogen		Iron (Fe).....	0.20%
Available Phosphate (P ₂ O ₅).....	8.00%	0.20% Chelated Iron	
Soluble Potash (K ₂ O).....	24.00%	Manganese (Mn).....	0.05%
Calcium (Ca).....	0.30%	0.05% Chelated Manganese	
Magnesium (Mg).....	0.15%	Molybdenum (Mo).....	0.0005%
0.15% Chelated Magnesium		Zinc (Zn).....	0.05%
Sulfur (S).....	0.16%	0.05% Chelated Zinc	
		Cobalt (Co).....	0.0005%

- ²⁶20-6-16 foliage formula -- sometimes labeled “tropical plant food” in small jars.

GUARANTEED ANALYSIS:	
Total Nitrogen (N).....	20%
7.9% Ammonical Nitrogen	
12.1% Nitrate Nitrogen	
Available Phosphate (P ₂ O ₅).....	6%
Soluble Potash (K ₂ O).....	16%
Calcium (Ca).....	1.00%
Magnesium (Mg).....	0.05%
Sulfur (S).....	1.00%
CHELATED MICRONUTRIENTS:	
Copper (Cu).....	0.05%
Iron (Fe).....	0.10%
Manganese (Mn).....	0.05%
Molybdenum (Mo).....	0.0005%
Zinc (Zn).....	0.05%

- ²¹20-10-20 water soluble - small jars often sold as “orchid food”, larger bags are sometimes labeled for fertigation or tropical plants.

GUARANTEED ANALYSIS:	
Total Nitrogen (N).....	20%
8.0% Ammonical Nitrogen	
12.0% Nitrate Nitrogen	
Available Phosphate (P ₂ O ₅).....	10%
Soluble Potash (K ₂ O).....	20%
CHELATED MICRONUTRIENTS:	
Copper (Cu).....	0.05%
Iron (Fe).....	0.10%
Manganese (Mn).....	0.05%
Molybdenum (Mo).....	0.0005%
Zinc (Zn).....	0.05%

- ⁹9-3-6 Foliage Pro® - Liquid product from Dyna-Gro Inc.

Guaranteed Analysis

Total Nitrogen (N)	9.0%
2.9% Ammoniacal Nitrogen	
6.1% Nitrate Nitrogen	
Available Phosphate (P ₂ O ₅)	3.0%
Soluble Potash (K ₂ O)	6.0%
Calcium (Ca)	2.0%
Magnesium (Mg)	0.5%
0.5% Water Soluble Magnesium(Mg)	
Cobalt (Co)	0.0005%
Copper (Cu)	0.05%
0.05% Chelated Copper (Cu)	
Iron (Fe)	0.1%
0.1% Chelated Iron (Fe)	
Manganese (Mn)	0.05%
0.05% Chelated Manganese (Mn)	
Molybdenum (Mo)	0.0009%
Zinc (Zn)	0.05%
0.05% Chelated Zinc (Zn)	

- Alfalfa Meal - This is an alternative to Alfalfa extract. It is a poor choice for soil amendment because over its lifetime it will trigger plants to ignore the plant hormone triacontanol.
- Azomite - If you like putting aluminum oxides in your yard this product is for you. None of the minerals listed for this product are available to plants except those in the Guaranteed Analysis. See Rock Dustrd.
- ^{cgw}Compost - thoroughly cured and ground composts of greenery waste are an excellent soil amendment. They should be added to soils prior to planting, comprising about 1/5th of the total volume.
- ^{fw}Filtered water - Unadulterated filtered drinking water such as store bought in bottles, or produced by home refrigerator water filter, or reverse osmosis system.
- ^{fe}Fish Emulsion - An organic source of nitrogen, phosphate, potash, and organic chelates that can mobilize some soil minerals for plants. Made from seagoing fish scraps (98%) and phosphoric acid (2%). Products containing kelp or seaweed extract not recommended.

GUARANTEED ANALYSIS:

Total Nitrogen (N)	5.0%
0.50% Ammoniacal Nitrogen	
3.75% Other Water Soluble Nitrogen	
0.75% Water Insoluble Nitrogen*	
Available Phosphate (P ₂ O ₅)	1.0%
Soluble Potash (K ₂ O)	1.0%
Derived from Seagoing Fish Emulsion.	
*0.75% slowly available nitrogen from seagoing fish emulsion.	

- ^{hs}Horticultural Sand -- Should comprise from 1/3 to 1/2 the total volume of a soil made from scratch. See Rock Dustrd.

- Ironite - A poor choice for iron and other nutrients. Typically contributes to mineral-lock in soils by the formation of Iron Phosphate and Iron Calcite. Chelated Iron products are a better choice for iron deficiency. Both organic and non-organic chelates are available.
- ^{js}Jump Start® by Grow More - A blend of general purpose plant growth hormones.

GUARANTEED ANALYSIS	
0.10-0-0	
Total Nitrogen (N).....	0.10%
0.10% Water Soluble Organic Nitrogen	
Iron (Fe).....	0.10%
0.10% Chelated Iron	
Zinc (Zn).....	0.05%
0.05% Chelated Zinc	
Derived from Kelp Meal (Ascophyllum Nodosum), Barley Meal, Alfalfa Meal, Mushroom Compost, Bat Guano, Iron from Iron EDTA, Zinc from Zinc EDTA	

- Kelp Meal - This is an alternative to seaweed extract^{se}. It is a poor choice for soil amendment because over its lifetime it will trigger plants to ignore gibberellic acid.
- Molasses - If you want to improve the brix of your fruit then insure potash input is at appropriate levels; i.e. in 1-1 or 1-1.5 with nitrogen. If the molasses product can actually be utilized by a plant then it may add weight to flowers and/or fruit but typically at the expense of taste. Many of these products are lignosulfonates -- a by-product of pulp mills. They often attract gnats.
- Perlite - As a soil amendment it is a poor choice for long term use because it breaks down into clay.
- rdRock Dust - Rock crushers, whether at a quarry or a construction site -- all produce rock flour as a by-product. It is a nuisance for the industry. Generally rock flour is whatever passes through the "3/32" gravel screen and hence is sometimes referred to as "3/32 minus". It is generally sourced from igneous and metamorphic rock. Plants have no access to these minerals because they are covalently bonded -- and no soil or soil biology process is going to make them available in a significant quantity in the next millennia or so. For that to happen, they would need to be in a chelated, not covalent form. The only minerals available to plants are those listed in the Guaranteed Analysis. On the plus side though, 3/32 minus from igneous rock (those without biotoxins) makes an excellent soil amendment sometimes termed Horticultural Sand^{hs}. It is often available from quarries for about \$12 / cubic yard.
- ^{se}Seaweed extract - Use only products made from Ascophyllum nodosum. Contains natural compounds of gibberellic acid, a general purpose growth hormone. Plants have a built-in "switch" that limit the amount of this hormone over a period of time. Overuse can have negative side effects. Typically used once per year in agriculture for specific effect, e.g. rooting cuttings or foliar application to fruit trees at onset of inflorescence.

GUARANTEED ANALYSIS**0.10 - 0 - 0.44**

Total Nitrogen (N)..... 0.10%

0.10% Water Soluble Organic Nitrogen

Soluble Potash (K₂O) 0.44%Derived from Norwegian Kelp
(*Ascophyllum Nodosum*)

- ^{spm}Sul-Po-Mag - a naturally occurring mineral (Langbeinite) utilized in agriculture as a source of sulfur, potash, and magnesium. Meets NOP requirements for organic agriculture.

Chemical Properties

<u>Property:</u>	<u>K₂SO₄·2MgSO₄</u>
Fertilizer analysis	21 to 22% K ₂ O 10 to 11% Mg 21 to 22% S
Water solubility (20 °C)	240 g/L
Solution pH	approx. 7

- Teas from compost, castings, fertilizers - An expensive and laborious method to filter water and/or feed plants. If an organic source of plant growth hormone is desired then use Seaweed Extract^{se}. If a liquid fertilizer is desired then choose from an organic or non-organic listed in the directions above.
- Vermiculite - Used in the horticultural industry as a top dressing in seed-starting trays. Not a good choice in long term soil mixes because it breaks down into silicate clays.
- ^{wc}Worm Castings - Fresh worm castings with live worm eggs are an excellent soil amendment for plantings in-ground and in large pots. They should be added prior to planting and comprise about 1/10th of the total soil volume.