

# FERTILITY



*Western Farm Service field representatives work closely with our grower customers to help develop strong fertility programs. To WFS, a fertility program is much more than just selling fertilizer. Fertility programs are developed with our growers to fit each unique growing situation. Soils, media, water, climate and nutritional needs of your crops are considered.*

Here are some questions that should be considered when developing a fertility program:

1. What are the nutritional needs of this crop? How long will the fertility need to last?
2. What growing media will be used and how does it interact with fertility? Have you tested it with a reliable laboratory such as Precision Agri Lab?
3. What is your water quality? Has it been tested for pH, EC or TDS? Do you have reliable, portable testing instruments? Water tests from Precision Agri Lab are available online through Ag Decision Network.
4. Is runoff likely to be a problem? Should you consider a slow or controlled release fertilizer?
5. How will your fertilizer be applied? Should you consider a fertilizer injector, either as a permanent installation or a portable such as a Dosatron®? Information is available directly from your local branch on permanently installed fertilizer injectors.
6. How will fertility be monitored once the crop is planted and growing?

## Factors Affecting Release from Controlled Release Fertilizers

	UF - Urea Formaldehyde	IBDU - Isobutylidene-diurea	SCU - Sulfur Coated Urea	PCU - Polymer/Sulfur Coated Urea	Polymer-Resin Coated Fertilizers
Moisture	x	x	x	x	x
Particle Size	x	x	x		
Soil pH	x	x			
Bacteria	x		x		
Temperature	x		x	x	x
Coating Thickness			x	x	x

## Typical Analysis for Organic Soil Amendments

Organic Amendment	Moisture Retention (% total volume)	pH	Organic Matter	EC (mmhos/cm)
Sphagnum Peat Moss	60-70	3.2-4.5	95-99%	.8-2
Sawdust	30-40	3.8-8.0	95-99%	.5-2
Ground Bark	30-40	4.0-8.0	90-95%	.5-2
Coir-Coconut Fiber	80-90	5.0-7.0	95-99%	.5-3.5
Compost	20-30	4.0-8.0	50-75%	1-10

Optimum growing ranges for pH, Electrical Conductivity (EC) and nitrates have been established for specific plant production. These ranges are guidelines, not absolutes. Growers will need to learn and modify their ranges depending on the crop they grow. Container size will also need to be considered. Usually, the larger the container, the more nutrients need to be available. Therefore, the optimum EC rate needs to be higher in larger containers than in smaller ones or plug trays.

Understanding the pH of irrigation water, fertilizers and growing media will help growers make appropriate fertilizer selection. For example, if irrigation water has a high pH and high alkalinity, then application of a high nitrate fertilizer (very basic) would affect the availability of several macro and micronutrients.

Growers can monitor nutrients by measuring the electrical conductivity (EC) or salt levels in the growing medium. The usual methods of measuring EC are the Pour Through and 1:2 Dilution extraction procedures.

### What is pH?

pH is a measure of how acidic or basic a solution is. It is measured on a scale from 0 to 14 with 7 being neutral, 0 the most acidic and 14 the most basic (or alkaline). Optimum pH for most plants is 6.5-7.0.

### What is EC?

Electrical Conductivity (EC) is defined as the ability of a solution to conduct an electrical current. Measured in PPM.

### What is TDS?

Total Dissolved Solids (TDS) is defined as the amount of solids dissolved in a solution. Measured in PPM.

### Extraction Methods to Measure pH & EC

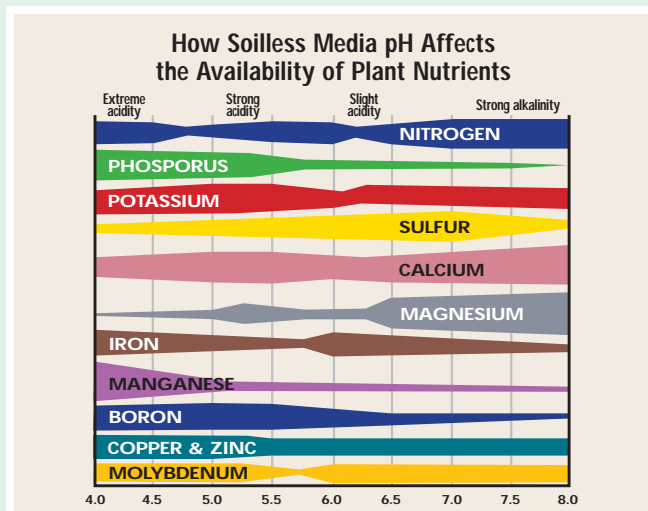
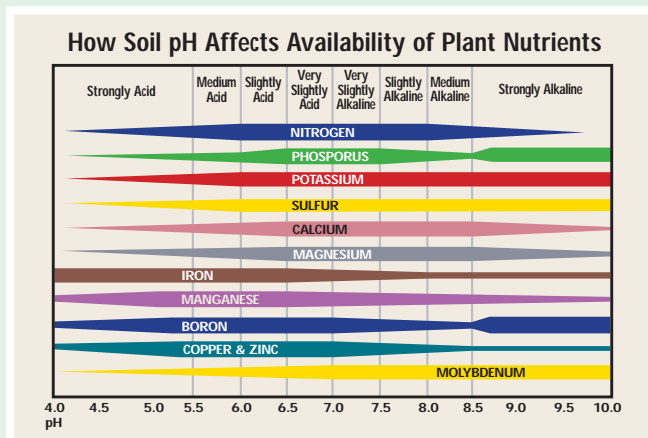
#### 1:2 Dilution

1. Mix 3 oz of soil with 6 oz of distilled water
2. Let mixture stand 15-20 minutes
3. Filter liquid into clean cup
4. Measure pH & EC by placing electrode directly into slurry

#### Pour Through Method

1. Collect leachate from root zone (Place a saucer or collection under plant)
2. Add distilled water to plant and collect an additional 2 oz of solution
3. Measure pH & EC of leachate

Always take multiple samples from each crop



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## LIQUID AND DRY FERTILIZERS – *Custom Formulations*

Western Farm Service is one of the few suppliers in the Pacific region that offers both dry and liquid custom formulations designed for the individual grower.

**Liquid Fertilizers** are available as basic products. Products can be custom blended with a variety of macro and micronutrients. Components available include but are not limited to:

AN 20	NSure	Potassium Thiosulfate
CAN 17	Phosphoric Acid	Thiocal
CN 9	Potassium Nitrate	Zinc Sulfate
UN 32	Sulfate of Potash	

- Dyes and soil surfactants can be added.
- N-Phuric Acid is available as a water conditioner where high bicarbonates are a problem.



Tanks are available for sale or loan depending on the local conditions. Check with your local branch for more details.

**Dry Fertilizers** are available bulk and bagged. They can be custom blended for individual grower needs. Western Farm Service supplies custom preplant fertilizers and amendments for many growers. WFS can provide the grower with a product ready to put in your soil and media mixes. Check this opportunity for cost and labor savings.

**Dry fertilizer components** available include but are not limited to:

Ammonium Nitrate 0-45-0	Potassium Nitrate Sulfate of Potash	Sulfate of Ammonia Muriate of Potash	Calcium Nitrate
Ammonium Phosphate	Urea	Iron Sulfate	
Zinc Sulfate	Micro Nutrients	Nitroform	

Organic Products: Blood Meal, Bone Meal, Fish and Feather Meal

Custom topdress fertilizers blended with Nitroform® are mixed for those growers that want slow release options in a custom topdress. Our own First Choice 20-9-9 Super Blend is good example of this type of fertilizer.

## Bagged and Bulk Soil and Media Amendments

Brands may vary by location so that WFS can offer local growers the best opportunities. Check with your local branch for more specifics.

Vermiculite	Calcium Carbonate
Horticultural Perlite	Hydrated Lime
Coir – Coconut Fiber (Grow Bags available)	Dolomite
Bark – Many sizes including Orchid	Gypsum
Seed Topper & Top Dressing	Sulfur (Powdered & Pelletized)
Peat Moss & Mixes	



Western Farm Service offers a full line of Hanna Instruments which are used to test for nutrients, soil and water. These products are well built and perform with high reliability. Hanna offers many more products - just ask for a complete catalog.



## Testers

Product Code	Hanna #	Description
89-36250	HI-98127	Waterproof pH and temperature tester with replaceable electrode
89-36251	HI-98311	Waterproof EC/TDS/temperature tester with replaceable electrode
89-36252	HI-98129	Waterproof pH/EC/TDS/temperature tester with replaceable electrode
89-36253	HI-98502	Soil LCD Thermometer with Stainless Steel Probe
89-36254	HI-77400P	Individual Calibration Solution Packets 20ml. - 5 each pH 4 & 7
89-36255	HI-770710	Individual Calibration Solution Packets 20ml. - 5 each pH 7 & 10



## Dosatron Injectors

### Non-Electric Chemical Injector

Dosatron injectors are durable, low maintenance and easy to install. They are non-electric, water driven injectors maintaining accuracy even at variable water flow rates. These injectors are made to handle fertilizers, insecticides, fungicides, algacides and wetting agents.

Product Code	Model	Flow Rate	Pipe Size	Ratio
89-28520	DI 16	1/3 pt-11gpm	3/4" NTP Thread	1:500-1:64
89-28530	DSA45	.5- 20gpm	1" NTP Thread	1:500-1:66
89-28500	D8R	2.2-40gpm	1 1/2" PVC	1:500-1:50
89-28510	D20S	5-100gpm	2" PVC	
89-28540	DosaCart			



D8R

The Dosatron Cart makes application of products fast and easy as you move from location to location. The cart has a 12 gallon tank with lid. It is designed for use with the 11gpm and 20 gpm Dosatron units.

Parts are available on an on order basis direct from the manufacturer at 1-800-523-8499.



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## Scotts Controlled Release and IBDU Fertilizers

Scotts offers a complete line of slow release and controlled release fertilizers for the horticultural grower. Each product is designed with different release patterns, some for topdress and some for incorporation. Each product has a specifications sheet which more fully explains its features and benefits. Your local WFS office will be happy to send you the specification sheet for the products that interest you.

Product Code	Scotts #	Description	Longevity at 70 degrees Soil Temperature	Bag Size
<b>IBDU Products</b>				
64-07255	90165	Topdress Special with IBDU 20-5-5	3-4 months	50#
64-07983	90174	Topdress Special with IBDU 22-5-6	4-5 Months	50#
64-09362	90176	Straight IBDU 31-0-0 Coarse	3-4 months	50#
<b>Poly S Products</b>				
64-74900	904006	17-3-6 Poly S with Minors Topdress	4-6 months	50#
64-06943	90388	25-6-10 +Fe Poly S Topdress	4-5 month	50#
64-08478	90200	35-0-0 Poly S	4-5 month	50#

## Osmocote Technology

Osmocote is composed of granules of dry plant nutrients which have been encapsulated within multiple layers of polymeric resin. Water vapor penetrates the permeable shell and dissolves the nutrient core. Actual product longevity will depend on temperature, coating thickness and moisture.

Product Code	Scotts #	Description	Longevity at 70 degrees Soil Temperature	Bag Size
64-02070	900496	12-4-12 Osmocote Palm	12-14 months	50#
64-61202	900036	14-14-14 Osmocote Regular	3-4 months	50#
64-61533	903226	15-9-12 Osmocote Plus **	5-6 months	50#
64-62280	900106	17-7-12 Osmocote Regular	12 months	50#
64-63524	900171	18-5-9 Osmocote Pro*	12-14 months	50#
64-63003	900086	18-6-12 Osmocote Regular	8-9 months	50#
64-63020	901396	18-7-10+ Fe Osmocote Pro	8-9 months	50#
64-400289	901326	19-5-9 + Minors Osmocote Pro	12-14 months	50#
64-63360	900146	19-6-12 Osmocote Regular	3-4 months	50#
64-63550	900170	20-4-8 Osmocote Pro*	8-9 months	50#
64-63512	90370	24-4-9 Osmocote Pro Extended	12 months	50#

\*\* Available in other longevities  
\* Contains IBDU, Poly-S, Osmocote

## Miscellaneous Products

64-10802	90026	Agriform Planting Tabs		500 21g Tabs
64-52200	90505	Micromax Micronutrient Mix		50#
64-51840	90507	Micromax Plus Micronutrient Mix		50#
64-82100	8435	STEP Hi Mag - Micronutrient Mix		50#



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APEX® products for horticultural uses, manufactured by Simplot Turf and Horticulture use POLYON® Polymer Coated Fertilizers (PCF). Products are available with 100% coating as well as in blends. Polyon® releases by osmosis, the precision, gradual diffusion of nutrients through an ultra thin polymer coating. The rate of diffusion is controllable by the thickness of the applied coating. It is essentially unaffected by varying amounts of soil moisture, microbes or pH levels. Osmotic

diffusion rates increase as soil temperatures increase, and decrease as soil temperatures decrease.

The APEX® product line is diverse, with products that will meet the needs of almost any horticultural grower. Product specification sheets are available for any of the listed products from your local Western Farm Service branch.



Product Code	Apex Code	Description	Longevity at 70 degrees Soil Temperature	Bag Size
64-02891	74221	14-14-14 Bloom	3-4 months	50#
64-04720	74362	16-5-9 Bloom	5-6 months	50#
64-06285	74363	18-8-8 Evergreen	8-9 months	50#
64-07260	74335	20-8-8 Evergreen	10-12 months	50#
64-06945	74318	19-6-12 Flower /Foliage	5-6 months	50#
64-06290	74319	18-6-12 Flower/Foliage	8-9 months	50#
64-02890	74160	14-14-14 Landscape Color	3-4 months	50#
64-00475	74184	0-46-0 Mono-Dicalcium Phosphate (Micro)		50#
64-07395	74229	21-2-11 Native	8-9 month	50#
64-02400	74167	13-5-8 Palm	3-4 months	50#
64-07870	74208	21-7-6 Cool Weather Topdress Special	3-4 months	50#
64-07790	74161	21-5-6 Super Iron Topdress Special	3-4 months	50#
64-07800	74162	21-5-12 Tree and Shrub	6-7 months	50#
64-08310	74166	23-6-12 Tree and Shrub	8-9 months	50#
64-08350	74164	24-4-12 Tree and Shrub	10-12 months	50#
64-06290	74222	18-6-12 Woody Plants	8-9 months	50#

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## Peters Professional® Product Line Water Soluble Fertilizers

Product Code	Product Formula	Product Name	Potential (CCE)*		Maximum Solubility (lbs/gal)	EC* per 100 ppm N (mmhos/cm)	Oz/100 gal to obtain 100 ppm N
			Acidity	Basicity			
Peters Professional		Standard Products					
64-69120	5-11-26	Hydro-Sol		210	4.00	1.90	27.00
64-64080	9-45-15	Plant Starter	960		2.50	1.20	14.80
64-65160	10-30-20	Blossom Booster	350		3.25	0.96	13.50
64-65880	15-0-15	Dark Weather Feed		300	3.50	0.74	9.00
64-71280	15-5-25	Poinsettia Peat-Lite	30		2.50	0.78	9.00
64-72000	15-10-30	Pot Mum Special	40		3.00	0.70	9.00
64-67320	15-15-15	Geranium Special	240		4.00	0.64	9.00
64-70920	15-16-17	Peat-Lite Special®	190		4.25	0.69	9.00
64-71750	15-20-25	Poinsettia Finisher	270		3.25	0.69	9.00
64-68404	15-30-15	Hi-Phos Special	660		3.25	0.62	9.00
64-71800	20-5-30	Potash Special	120		3.00	0.45	6.75
64-71640	20-10-20	Peat-Lite Special®	400		4.00	0.66	6.75
64-66600	20-10-20	General Purpose	410		4.00	0.65	6.75
64-66964	20-20-20	General Purpose	560		3.50	0.40	6.75
64-72720	24-8-16	Tropical Foliage	730		3.00	0.44	5.63
64-66240	27-15-12	Foliar Feed	930		4.25	0.22	5.00
64-70300	15-11-29	Peat-Lite Special®	50		3.00	0.69	9.00
64-69480	18-18-18	Orchid Special	570		3.50**	0.40**	7.50
64-67860	20-0-20	Hi-Cal Peat-Lite Special		10	3.00	0.50	6.75
64-68040	30-10-10	Hi-Nitro	1040		4.25	0.14	4.50

## Peters EXCEL® and Miracid® Professional Product Line Water Soluble Fertilizers

Product Code	Product Formula	Product Name	Potential (CCE)*		Maximum Solubility (lbs/gal)	EC* per 100 ppm N (mmhos/cm)	Oz/100 gal to obtain 100 ppm N
			Acidity	Basicity			
Excel							
64-65913	13-2-13	EXCEL Plug Special		342	5.00	0.92	10.30
64-65930	14-5-38	EXCEL K-Cel®		307	2.00	0.96	9.65
64-65888	15-2-20	EXCEL Pansy, Salvia, Vinca		238	3.50	0.69	9.00
64-65890	15-5-15	EXCEL Cal-Mag		141	3.00	0.66	9.00
64-65900	20-5-19	EXCEL Poinsettia	350		3.00	0.62	6.75
64-65950	21-5-20	EXCEL All Purpose	389		3.00	0.58	6.43
Miracid							
64-64440	21-7-7	Miracid Acid Special	1575		4.00	0.65	6.44

\* For more information refer to Peters Professional® catalog sheets.

\*\* Figure has not been verified.

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