

## Fertilizer Guide for Landscape Palms

by Charlie Beck

Not all palm fertilizers are the same. There are a wide variety of formulations offered as palm fertilizer. Nutrient ratios and nutrient sources vary widely. How can one evaluate a bag of palm fertilizer? Why even fertilize at all? Hopefully this article will help guide you in selecting a palm fertilizer. All of my editorial comments pertain to growing palms in Palm Beach County on sugar sand.

We are lucky because the majority of palm fertilization research is performed right here in South Florida. Dr. Tim Broschat and his associates have researched palm nutrition for many years at the University of Florida Research Center in Ft. Lauderdale. Many palm nutritional publications have been issued based on actual scientific research. Unfortunately, not all soils in South Florida are uniform in quality and consistency. Much of Dade County has a highly alkaline limestone soil. Areas of marl, muck and sand make up others areas of South Florida. Much of Palm Beach County has sugar sand soil which is quite different from the soil at the University of Florida Research Center in Ft. Lauderdale. Soil PH, water and nutrient holding capacity can have quite an effect on which fertilizer is best for your garden. With that said, I still believe that recommendations from University of Florida Institute of Food and Agricultural Sciences (IFAS) and Electronic Data Information Source (EDIS) publications should be the basis for evaluating a palm fertilizer.

Research recommendations were based on testing fertilizers on a limited number of palm species. New palm species are continually introduced into South Florida. These species may have substantially different nutritional requirements. If we grow a vast variety of palms, we will need to monitor these palms for any nutritional deficiencies that might arise. No single palm fertilizer is perfect for all palms.

Not all palms require the same nutrients. Most Florida native palms and some exotic palms do not require any fertilization at all. Most exotic palms come from areas with soil which is richer than our native sugar sand. These palms depend on supplemental nutritional applications to thrive. Palms grow differently even within the same species. Many palm genera and species are prone to certain nutritional deficiencies. The trick is to find a fertilizer element ratio which is most effective for most palms. Even though no palm fertilizer is perfect for all palms, it's best to use fertilizer ratios within the ranges established by research.

Commercial in ground nurseries typically maximize growth and avoid nutritional deficiencies

with supplemental spray or drip feedings in addition to granular fertilizer. Palms in our garden will also develop nutritional deficiencies which will need correction by either spray or granular supplemental feeding.

Growing palms in pots requires a different ratio of fertilizer elements. This is because the potting soil is usually acidic and the nutritional holding capacity is quite different from our native soil. Fertilizer recommendations in this article are for growing in the ground and not for potted palms.

Macro elements typically take up 80% or 40 pounds of a 50 pound bag. The macro elements are N, P, K, and Mg. Altering the ratio of macro elements from the recommended 8-2-12-4 ratio comes at the expense of other nutritional elements. If you examine the example Formulation Sheet (page 6) there are only 109 pounds of filler in 2,000 pounds of fertilizer. If one element is increased above the recommended amount (especially a macro element) then certainly it will be at the expense of another nutrient.

Micro elements are Manganese (Mn), Copper (Cu), Iron (Fe), Zinc (Zn), and Boron (B). Micro elements and filler make up 10 pounds of a 50 pound bag. There is not much "wiggle room" when formulating a quality fertilizer. We will discuss what forms of each element that are recommended by IFAS later in this article.

Practically every hardware store and garden center sells palm fertilizer. All of the bags display a Guaranteed Analysis Label as mandated by the State of Florida. On this label all of the essential nutritional elements are listed per regulations established by the state. Whether an ingredient is listed as "slow release" or "water soluble" is also controlled by state regulations. Regulations controlling fertilizer labeling are good for the homeowner because without them it would be impossible to evaluate the quality of the fertilizer.

Not all information is listed on the Guaranteed Analysis Label. Fertilizers are formulated by combining ingredients by weight. Actual ingredients are listed on a Formulation Sheet. The mix of ingredients are added together so that the total adds up to 2,000 pounds or what is typically stacked on a pallet of fertilizer. If you do not purchase fertilizer by the pallet you never get to see the Formulation Sheet and you never see the full makeup of the fertilizer. There are a few elements such as iron, boron, etc. which are important but are not necessarily listed in detail on

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**High Quality Ingredients Underlined**

**TYPICAL PALM  
FERTILIZER LABEL  
GUARANTEED ANALYSIS  
(PERCENT)**

Proper Ratio of N-P-K →

**8-2-12**

Guaranteed Analysis (Percent)

Total Nitrogen (N)*	8.00
None Nitrate Nitrogen	
None Ammoniacal Nitrogen	
8.00 Other/Water-Sol.Nitrogen (And/Or Urea Nitrogen)	
None Water Insoluble Nitrogen	
Available Phosphate	2.00
Soluble Potash	12.00
Chlorine Not More Than	2.00

Derived From:

High Percentage of Coated Nitrogen  
(Slow Release)

- POLYMER COATED SULFUR COATED UREA
- SUPERPHOSPHATE
- POLY/SULFUR COAT SULFATE OF POTASH
- 5.60 Units = Slow Release Nitrogen\*
- 9.60 Units = Slow Release Potash

High Percentage of Coated Potash  
(Slow Release)

Statement of Secondary Plant Foods:

Total Magnesium as Mg	4.00
4.00 Soluble Magnesium as Mg	
2-4% → Total Manganese as Mn	1.65
1.50 Soluble Manganese as Mn	
0.04-0.08% → Total Copper as Cu	0.05
2-4% → Total Iron as Fe	2.03
1.60 Soluble Iron as Fe	
Look For <u>Chelated Fe</u> → 0.10 Chelated Iron as Fe	
0.06-0.15% → Total Zinc as Zn	0.03
0.03 Soluble Zinc as Zn	
0.05-0.15% → Boron	0.20

4% Mg  
Kieserite is slow release

Derived From:

- MAGNESIUM SULFATE (KIESERITE)
- MANGANESE SULFATE
- IRON SULFATE
- IRON EDTA/IRON DTPA
- ZINC SULFATE

EDTA, DTPA, and EDDHA are Chelated Fe

Granubor is slow release → BORON

**CUSTOMER FORMULATION SHEET**

	No.	Material	Lbs.	Nit	NNit	ANit	SNit	INit	APA	K20
N →	626	XCU Gr. 43-0-0	372	800			800			
P →	1240	TRIPLE (GRAN) 44%	90						200	
K →	1410	SUL COAT SOP 39% GR BULK	615							1200
Mg →	1708	KIESERITE 15% GR	533							
Mn →	2203	TECMANGAM 32% (Imperial)	93							
	2504	IRON MONO 31% (GR)	103							
	2609	FE TRACH 5%	40							
	2806	ZINC SULFATE 35% GRAN	1							
	2904	BORON (GRAN) 10% 50# BAGS	40							
	4001	GRAY FILLER (GR) 240 SGN	109							
			_____	_____	_____	_____	_____	_____	_____	_____
			2000	800	None	None	800	None	200	1200
		Trachelene (EDDHA) Chelated Iron								
		Granubor								

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the Guaranteed Analysis Label. We will discuss some of these elements later in this article.

**Nitrogen (N)**

Nitrogen typically drives the formula. Nitrogen pushes palm growth. Excessive growth due to ratios of N higher than 8%, typically result in a need for higher levels of other macro and micro elements. But due to the greater amount of N in the bag other macro and micro nutrients are sacrificed due the additional weight of N. Extra nitrogen typically causes nutritional deficiencies - not necessarily in all palms, but in enough palms to make your job maintaining your palms more work.

So many palm fertilizers, especially inexpensive “box store fertilizers” contain higher levels of N. I’m sure the fertilizer companies are aware of IFAS recommendations. I bet profit is the motive for companies formulating palm fertilizers with N levels higher than 8%. Maybe the unsuspecting homeowner only buys fertilizer based on cost or on the basis of quick initial spurt of growth and greening. Maybe the uninformed homeowner doesn’t associate the minor nutritional deficiencies which develop later were caused by the high nitrogen fertilizer applied months ago. Dr. Broschat recounted a story about a native

*Sabal palmetto* that was forced into a steep decline by an application of high nitrogen “lawn type” fertilizer. The high N caused a spurt of growth which resulted in an out of balance supply of the other nutritional elements. Not all palms will respond this way but why take the chance? IFAS recommends 8% N so why would you use a fertilizer with a higher amount? I wouldn’t.

Nitrogen should be from a 100% slow release source. Recommended sources of N include sulfur coated urea, urea-formaldehyde, resin-coated urea and resin coated ammonium salts. I have never seen a fertilizer label state 100% slow release N, even though the N source is considered 100% slow release. The Florida Testing Lab must have determined that these slow release sources do have some quick release component. Regulations require the label to state less than 100% slow release N.

The N source on our example label is Polymer Coated Sulfur Coated Urea. The label states 5.60 units of slow release nitrogen which means 5.6% of the bag weight or 70% of the N in the bag. This is about as good as it gets, so look for approximately 5.6 units of slow release N on the label.

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### **Phosphorous (P)**

Not much is mentioned about P in palm fertilization literature. Phosphorous at a 2% ratio is all that is recommended. There is no need for slow release P or are there any specific sources recommended. Some of the literature doesn't even list P as a macro ingredient. Although P deficiency is rare, the symptom of P deficiency is pencil pointing. This is a condition where the stem becomes thinner as time goes on. Pencil pointing is also a symptom of Manganese deficiency and usually not due to a lack of P. Our label example shows a content of 2% P.

### **Potassium (K) also known as potash**

Many years ago Dr. Broschat concluded that K deficiency was the most common deficiency in Florida grown palms. At that time K levels in palm fertilizers was increased to 12% and 100% slow release K was recommended. Sulfur coated potassium sulfate is the recommended source. Our example label lists 9.6 units of slow release potassium or 9.6% of the bag weight or 80% of K in the bag. This source of K is considered 100% slow release even though the label indicates 9.6 units slow release. Again, the Florida Testing Lab must have determined a quick release component in what is considered a slow release ingredient. I believe the State of Florida regulations are the cause of this disconnect. In any case 9.6 units of slow release potash or potassium is the mark of a quality palm fertilizer.

### **Chlorine**

Chlorine is always stated "not more than" a certain amount. A rule of thumb is to limit chlorine to less than 2%. This is a byproduct of the other ingredients and not a desirable element to have in the mix.

### **Magnesium (Mg)**

Magnesium is also considered a macro element. The 4% recommended amount is twice the recommended amount of P. As you drive around South Florida you see massive amounts of Mg deficiency, so you really want to seek out a fertilizer with a high quality Mg source. Mg is a sleeper element which can separate a quality palm fertilizer from a cheap fertilizer. The literature states that 100% kieserite is the recommended source of Mg. Sulfur coated Mg releases too slowly to be effective. Magnesium sulfate (Epsom salt) is not recommended in a granular palm

fertilizer due to its quick release. Even though Florida Testing Lab considers kieserite, water soluble, it will release Mg for 6 weeks. Magnesium sulfate (Epsom salt) releases for only 10 days. This info was learned through personal correspondence with Dr. Broschat. Our Guaranteed Analysis Label example indicates Mg source to be Magnesium Sulfate (kieserite). This is what you should look for in your palm fertilizer.

### **Manganese (Mn)**

Manganese is recommended between 2 and 4%. Manganese sulfate is the recommended source. This is a water soluble source. Our example label states 1.65% Mn. This is less than an ideal amount so you might want to be on the watch for Mn deficiency in your garden if you use this fertilizer. Stunted emerging fronds are a symptom of Mn deficiency. The common name of this deficiency is frizzle top.

### **Copper (Cu) and Zinc (Zn)**

These are micro elements which are recommended in a soluble form such as Cu sulfate and Zn sulfate.

Copper content should be 0.04-0.08%

Zinc content should be 0.06-0.15%

### **Iron (Fe)**

Iron promotes dark green fronds. Recommended iron content is between 2-4%. Iron sulfate is the most common form of iron in palm fertilizers. IFAS states "iron sulfate is rather ineffective in most Florida soils." IFAS recommends blending iron sources with chelated forms such as Trachelene Fe (EDDHA.) This product is very expensive (\$79 per 5 pounds, retail) and it only contains 5% iron by weight. So other forms of chelated iron are also recommended such as EDTA and DTPA. Dr. Broschat relayed to me that if a chelated form of iron is used, then you can cut the percentage of iron content by a factor of ten. That means 0.2-0.4% chelated iron is as effective as 2-4% of a non-chelated iron source. The important thing to remember here is look for some chelated iron in the analysis.

If you grow your palms in highly alkaline soil, you should read EDIS Pub#HS1208. This can easily be found on the internet. This publication explains, in detail, that Trachelene Fe (EDDHA) is the most effective iron source on highly alkaline soils. I have found this to be true in our garden. Iron deficiency in highly alkaline areas is difficult to correct

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with any supplement other than Trachelene Fe (EDDHA.)

### **Boron (B)**

As I mentioned in many of our previously published newsletters, boron is the number one deficiency found in our garden. I need to apply supplemental boron to many palms on a regular basis, so I am particularly interested in this element. IFAS recommends boron content between 0.05 and 0.15%. I've been applying a custom fertilizer with 0.2% boron content for over 2 years and still have problems with boron deficiency. You need to be careful with boron applications- too much can be toxic to your plants.

Granubor is the best source of boron in your palm fertilizer. Granubor is a slow release form of B. Unfortunately, the Guaranteed Analysis Label does not always state the source of boron. You might need to see the Formulation Sheet to determine the actual source of boron.

I've been told by my fertilizer company representative that the State of Florida has a new requirement concerning B labeling. The state requires listing only water soluble boron on the label. If Granubor is the source of B, only one fifth of the B content will be stated on the label. For a fertilizer containing 0.2% Granubor the label will only show a content of 0.04%. Go figure!

The first thing to look for is a boron content between 0.05-0.15%. If Granubor is the B source, then the Guaranteed Analysis Label will list only the water soluble amount. You might need to see the Formulation Sheet to verify the B source. This is not an easy thing to verify.

### **Conclusion**

I marked up a Guaranteed Analysis Label with important indicators of a quality fertilizer. I have also supplied you with the corresponding Formulation Sheet. Even though you might not have a Formulation Sheet available when buying fertilizer, generally,

there is enough information on the label to evaluate the bag contents. Remember you usually get what you pay for and dealing directly with the fertilizer company (cutting out the retailer) usually means more value for the customer. We will continue to offer quality palm fertilizer at our Palm Beach Palm and Cycad sales.

### **KEY ELEMENTS:**

Nitrogen (N) - 8%, approximately 5.60 units slow release

Potassium or potash (K) - 12%, approximately 9.60 units slow release

Magnesium (Mg) - 4%, kieserite as source

Manganese (Mn) - 2-4%

Iron (Fe) - 2-4%, some chelated source preferred

Boron (B) - 0.05-0.15% granubor source is preferred (if granubor 0.01-0.03%)

### **Last word**

A few years ago Dr. Broschat gave a presentation at one of our meetings. He told us that skipping fertilization in the winter is no longer recommended. He told us that vigor and frond count increase dramatically if you fertilize year round, even in the winter. After hearing that I now fertilize every 3 months year round. I can testify that Dr. Broschat was right. The difference in spring time vigor is incredible when adding a winter fertilization. Let's finally put to rest the undocumented theory that palms don't absorb fertilizer during the winter!

### **References:**

1. Research by Dr. Timothy Broschat - University of Florida, IFAS extension
2. EDIS pub #ENH1009 Fertilization of Field-Grown and Landscape Palms in Florida
3. EDIS pub #ENH1012 Boron Deficiency in Palms
4. EDIS pub #HS1208 Understanding and Applying Chelated Fertilizers Effectively Based on Soil PH
5. Book - Ornamental Palm Horticulture by Timothy Broschat and Allen Meerow