

State Registration and Labeling Realities for Biochar Products

Presented by:

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Subjects

- **Current Realities of the Biochar Marketplace**
- **Registration Basics**
- **Labeling Basics**
- **Certified Organic ‘Listing’**



Perspective

Biochar production and market expansion.....

Learn from history of compost, AD, worm castings, industries/markets in the USA

Need to follow a similar path....

- ***Science-based claims, more uniformity for customer confidence, follow labeling/registration regulations***
- ***Interest in more inclusive definition, classification system (IBI), national testing Program (USBI), work on uniform claims***



		Dry Basis Unless Stated: Range		Units	
Moisture (time of analysis)	#DIV/0!		% wet wt.		ASTM D1762-84 (105c)
Organic Carbon	#DIV/0!		% of total mass		Dry Combust-ASTM D 4373
Hydrogen/Carbon (H:C)	#DIV/0!	0.7 Max	Molar Ratio		H dry combustion/C(above)
Total Ash	#DIV/0!		% of total mass		ASTM D-1762-84
Total Nitrogen	0.00		% of total mass		Dry Combustion
pH value	0.00		units		4.11USCC:dil. Rajkovich
Electrical Cond. (EC20 w/w)	0		mmhos/cm	dS/m	4.10USCC:dil. Rajkovich
Liming (neut. Value as-CaCO3)	#DIV/0!	percent	%CaCO3		Rayment & Higginson
Particle Size Distribution ASTM D 2862 granular					
< 420 um	#DIV/0!	percent			Basic Soil Enhancement Properties
420 - 2380 um	#DIV/0!	percent			Results units/meth. Meth.
2380 - 4760 um	#DIV/0!	percent			Potassium
> 4760 um	#DIV/0!	percent			Total (K)
					#DIV/0! mg/kg B
					Available (K)
					#DIV/0! mg/kg C
All units mg/kg dry unless stated: Range of Meth. Det.					
	Results	Max. Levels	Limit (ppm)	Method	Phosphorus
Arsenic (As)	#DIV/0!	12 to 100	0.15	E	Total (P)
Cadmium (Cd)	#DIV/0!	1.4 to 39	0.005	E	Available (P)
Chromium (Cr)	#DIV/0!	64 to 1200	0.015	E	Nitrogen
Cobalt (Co)	#DIV/0!	40 to 150	0.25	E	Total Nitrogen (N)
Copper (Cu)	#DIV/0!	63 to 1500	0.5	E	0.00 mg/kg KJN
Lead (Pb)	#DIV/0!	70 to 500	0.1	E	Ammonia(NH4-N)
Molybdenum (Mo)	#DIV/0!	5 to 20	0.6	E	#DIV/0! mg/kg A
Mercury (Hg) (ppb)	#DIV/0!	1k to 17k*	0.160 ppb	EPA 7471	Nitrate (NO3-N)
Nickel (Ni)	#DIV/0!	47 to 600	0.05	E	#DIV/0! mg/kg A
Selenium (Se)	#DIV/0!	1 to 36	0.25	E	Organic (Org-N)
Zinc (Zn)	#DIV/0!	200 to 7000	0.1	E	#DIV/0! % dw D
Boron (B)	#DIV/0!	Declaration	1	TMECC	Volatlie Matter
Chlorine (Cl)	#DIV/0!	Declaration	0	TMECC	Butane Act.
Sodium (Na)	#DIV/0!	Declaration	5	E	#DIV/0! g/100g dw
					Surface correlation
					#DIV/0! m2/g d. wt.
					k = 1000
					Method A Rayment & Higginson
					B Enders & Lehmann
					C Wang after Rajan
					D ASTM D1762-84
					E EPA3050B/EPA 6010

AAPFCO

Organization of State DOAs

- Work together on issues affecting State DOAs regarding the distribution of feed, lime, fertilizers, and soil amendments

- Involve *industry* in discussions
- Goal: uniformity from state to state
- Create *model* legislation & regulation, labeling law



State regulations affect how we 'legally' approach the market

Regulatory Background

- **48 states have fertilizer laws (not HI or AK), 38 have soil amendment laws**
 - **Biochar currently considered a soil amendment; except California**
 - **But doesn't always have to be the case**
- **Individual State DOA's decide what you can and cannot state on the label**
 - **Biochar producers / marketers have to register product in all states that product is distributed, and meet their labeling and distribution regulations**
 - **Even if selling over internet**

Related Regulation

- Typically, State DOAs (*Control Officials*) regulate the distribution of products, not their production
 - Can regulate product quality (e.g., heavy metals, pathogens, etc.) *'Adulteration'*
 - Regulate labeling text (during the registration process) *'Also adulterated if it doesn't meet claims'*
 - Claims (benefits), terms, units of measure, other
 - Providing any nutrient data, technically, makes your product a fertilizer

**Some States have gotten very conservative about labeling claims, especially with soil amendments / conditioners*



Current Registration Options

- **Register as soil amendment**

- No nutrient claims (unless dual registration), volume vs. weight, must negotiate label claims

- **Register as fertilizer**

- Sell by weight, moisture content vs. nutrient claims, etc.

Lime?

- **Dual registration** – few states (e.g., PA, IL)

- **Don't register?** (*OK, until you get caught*)

CDFA / OIM Registration

Biochar Registration Aid Cont.

Label Requirements:

1. Label must state the feedstock(s) for the biochar. For example: wood biochar or biochar derived from wood.
2. 100% Biochar products can only be registered as Auxiliary Soil and Plant Substances (ASPS). If biochar is blended with other soil amendment inputs, it can be categorized as a packaged or bulk soil amendment.
3. If International Biochar Initiative (IBI) certification claimed, provide a copy of the certification.

Label Format

1. If the product is an Auxiliary Soil and Plant Substance (ASPS), add the percent of biochar being guaranteed under a "NON-PLANT FOOD INGREDIENT" heading. For example:

NON-PLANT FOOD INGREDIENT

95%..... Wood Biochar

2. If the product is a combination product that guarantees nutrients, add the percent of biochar being guaranteed under an "ALSO CONTAINS NON-PLANT FOOD INGREDIENT" heading. For example:

ALSO CONTAINS NON-PLANT FOOD INGREDIENT

95%..... Wood Biochar

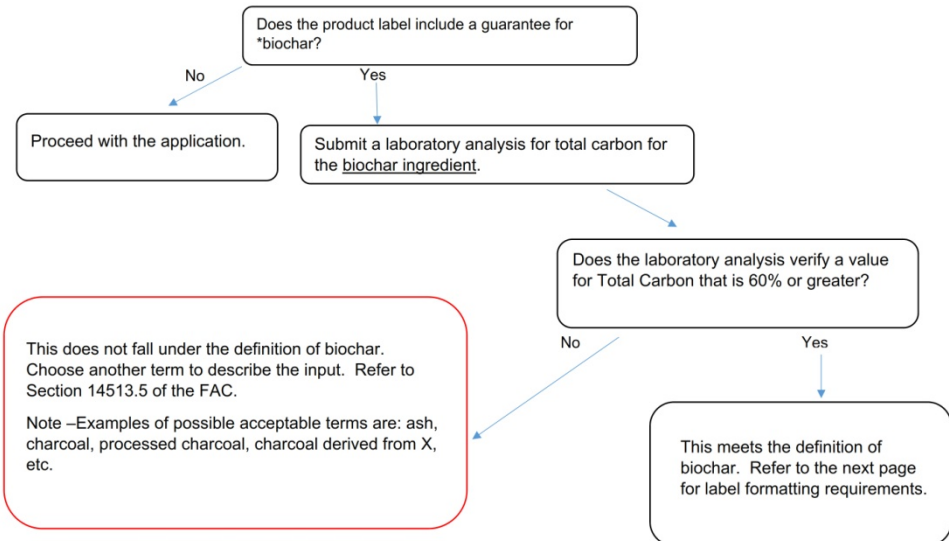
3. If the product is a packaged soil amendment or a combination product that guarantees nutrients with a soil amendment ingredient section, add biochar to the soil amendment ingredient list.

Rev. December 2017



Auxiliary soil and
plant substances
(or OIM product?)

Biochar Registration Aid



*Biochar means materials derived from thermochemical conversion of biomass in an oxygen-limited environment containing at least 60% carbon. Refer to Section 14513.5 of the Food and Agricultural Code.

Rev. December 2017

Related Definitions

Soil Amendment – (commonly referred to a Soil Additive or Soil Conditioners), means any substance or a mixture of substances which is intended to improve the physical, chemical, biochemical, biological or other characteristic of the soil, except fertilizer, agricultural liming materials, unmanipulated animal manures, un-manipulated vegetables manures, pesticides and other materials exempt by regulation.

MANY STATES WILL REQUIRE UNIVERSITY RESEARCH TO PROVE CLAIMS

CLAIMS MUST BE TRUTHFUL, BASED ON SUGGESTED APPLICATION RATES

Related Definitions

Fertilizer – any substance containing one or more recognized plant nutrient(s) which is used for its plant nutrient content and which is designed for use or claimed to have value in promoting plant growth, except un-manipulated animal and vegetable manures, marl, lime, limestone, wood ashes and other products exempted by the regulation by the _____.

Specialty Fertilizer – a fertilizer distributed for non-farm use.

MAY HAVE TO PROVE NUTRIENT RELEASE / PLANT AVAILABILITY

Liming Agent – claims and registration?



Related Definitions

Limestone – means an agricultural liming material consisting essentially of calcium carbonate or a combination of calcium carbonate with magnesium carbonate capable of neutralizing soil acidity (Official 1998). *Uniform Agricultural Liming Materials Bill (1973)*

Lime / pH raising claims are problematic (technically not legal)

Uniform Bill requires minimum CCE values

TABLE 1. AGRICULTURAL LIMING MATERIALS

Material	Calcium Carbonate Equivalent (CCE) ,percent
Burnt Lime	Not less than 140
Hydrated Lime	Not less than 110
Limestone	Not less than 80
Slag	Not less than 80
Shells	Not less than 80

States also often have fineness / sieve size requirements, and differing methods to illustrate CCE

(Some states many not care about claim)



RALEIGH-PLUS
Calcium Supplement Fertilizer
0-0-0

Guaranteed Analysis:
 Calcium.....15%

Derived from: Calcium Oxide, Calcium Hydroxide, and Calcium Carbonate.

This product provides essential calcium for plant growth. **RALEIGH-PLUS** also reacts in soils to gradually improve soil, tilth, and structure. **RALEIGH-PLUS** is produced by the City of Raleigh using a pasteurization process by stabilizing biosolids. Dewatered biosolids are blended with alkaline by-products such as limekiln dust to manufacture this product. This process produces "Class A Exceptional Quality" biosolids.

Instructions for Use:

It is recommended that you have your soil tested before applying any fertilizer product.

Application rates should be based on soil fertility analyses. Apply **RALEIGH-PLUS** in the same manner as any other bulk fertilizer, using the same methods and procedures for responsible environmental practices, including the following:

- * Application of **RALEIGH-PLUS** is prohibited except in accordance with these instructions.
- * Maintain a 10ft. buffer between any **RALEIGH-PLUS** application site and any public or private water source (including wells) and any stream, lake or river.
- * Do not apply **RALEIGH-PLUS** to any site that is flooded, frozen or snow covered.
- * Provide adequate procedures to prevent surface runoff from carrying **RALEIGH-PLUS** into any surface waters.
- * Take the necessary steps to prevent wind erosion and surface runoff from carrying **RALEIGH-PLUS** onto adjacent property or into any surface waters.

Physical Properties:
 pH.....9.0-12.0
 Percent Solids.....50-65%
 Bulk Density.....60-65 lbs/cubic ft.

Manufactured by:
 The City of Raleigh Neuse River WWTP
 8500 Battlebridge Rd.
 PO Box 590
 Raleigh, NC 27602
 919-662-5700

Often register recycled products as fertilizers

Can't meet CaCO₃ or gradation (sieve size) requirements

↓ Typical Label Data ↓

Guaranteed Analysis

Calcium (Ca): 36%
 Calcium Carbonate (CaCO₃): 94%
 Calcium Carbonate Equivalent (CCE): 94%
 Moisture content does not exceed: 1.0%

Sieve Sizing Before Pelletizing

100% passing 4-mesh
 100% passing 8-mesh
 100% passing 10-mesh
 100% passing 20-mesh
 98% passing 40-mesh
 97% passing 50-mesh
 95% passing 60-mesh
 90% passing 100-mesh
 70% passing 200-mesh

Derived from limestone.

PENNSYLVANIA:

ENV = 90%
 OHIO:
 1823 Pounds of ENP/Ton

IOWA:

Iowa Secretary of Agriculture Certified 1820 lbs ECCE per ton.

FLORIDA:

F001993: this material requires 1894 lbs to be equal to one ton of standard liming material.

NEBRASKA, OKLAHOMA:

ECCE = 91%

KANSAS

ECC = 91.6%
 ECCE = 1832 lbs/ton

MINNESOTA:

ENP = 90%

MISSOURI:

ENM = 740 lbs/ton; Emg = 2 lbs/ton

NORTH CAROLINA:

1880 lbs. of this material equals one ton of standard liming material. One standard ton of lime is 90% Calcium Carbonate Equivalent
 ENV = 99%

TENNESSEE:

RNV = 93%

MASSACHUSETTS:

ENV = 90%

NEW YORK:

TNV = 94%

WISCONSIN:

Neutralizing Index: 92
 Neutralizing Index Zone = 90-99

OREGON:

Lime Score = 92



Official Biochar Definitions

AAPFCO (T-101) Biochar - is a solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis) containing at least 60% carbon. Feedstocks may be composed of crop residue, wood or other forest waste, and animal manures. Materials transported in salt water, painted, or treated with preservatives are not permitted. When listing biochar in an ingredient statement, the feedstock shall be designated by prefixing the term biochar with the feedstock from which it was produced; i.e. poultry litter biochar, green waste biochar, papermill biochar, etc. When more than one feedstock is involved, all feedstocks greater than 10% of the total volume are to be listed by decreasing volume.... *Need more inclusive spec for market expansion, acknowledge various applications ?*

CDFA - Biochar means materials derived from thermochemical conversion of biomass in an oxygen-limited environment containing at least 60% carbon.

Registration Costs

- Fees associated with registering both soil amendments and fertilizers vary from state to state
- There may be a registration fee per product or company and/or a tonnage fee (known as an inspection fee).
- Often you pay both a registration fee (*typically* ranging from \$0 to \$250/product and a tonnage fee (*typically* ranging from \$0 to \$0.90/ton).



Biochar Labels

What needs to be on the label?

What cannot be on the label?

Bagged product = Bag is label
Bulk product = Literature, B/L is label

Websites count, spoken word??



Key Steps for the Registration and Labeling of Biochar

1. Test your product, understand results
2. Determine / Consider
 - What claims you want to make
 - Applications you want to promote
 - What type of product you want to sell it as
(the type of product you register it as, depends on what you say on the label)
3. Determine which states you want to market into
(must meet regulations, and labeling law for all)
4. Read the regulations (AAPFCO, State)
5. Develop draft label, seek assistance, our review with individual states
6. Complete registration paperwork



Biochar Distributed as a Soil Amendment

- **Uniform Soil Amendment Bill**
 - Brand name
 - Net weight (or volume)
 - Guaranteed analysis = ingredient statement
 - Purpose of product (benefits/claims)
 - Directions for application
 - Name and address of applicant

Other text allowable, claims, etc.
'The more states, the more hassles'



Biochar

Distributed as a Fertilizer

- **Uniform State Fertilizer Bill**

- Brand (product name)
- Grade (e.g., 0-0.5-0.5)
- Guaranteed analysis – chemical breakdown (e.g., WIN, WSN)
- Directions for use for fertilizer distributed to the end user
- Name and address of registrant/licensee
- Derivative statement – nutrient sources
- Net weight (IMPERIAL AND METRIC UNITS)



Biochar

Distributed as a Fertilizer

- **Other stuff**

- Heavy metal statement and testing – west coast states primarily
- *Apply only as directed.....*statement
- Allowable claims and terms on labels are based on historical product research, product type being registered (fertilizer vs. soil amendment), whim of individual State/Control Official
- No pesticidal or unproven claims!
(*University research*)



Biochar Claims from Scientific Text

- Enhanced plant growth
- Suppressed methane emission
- Reduced nitrous oxide emission (estimate 50%)
- Reduced fertilizer requirement (estimate 10%)
- Reduced leaching of nutrients
- Stored carbon in a long term stable sink
- Reduces soil acidity: raises soil pH
- Reduces aluminum toxicity
- Increased soil aggregation due to increased fungal hyphae
- Improved soil water handling characteristics
- Increased soil levels of available Ca, Mg, P, and K
- Increased soil microbial respiration
- Increased soil microbial biomass
- Stimulated symbiotic nitrogen fixation in legumes
- Increased arbuscular mycorrhizal fungi
- Increased cation exchange capacity

*But...how many of these claims can / should we make on a label?
(Is there enough scientific back-up, are they legal claims, are they relevant to buyers, will they be allowable for ALL biochars?)*



Allowable Biochar Claims if Selling Nationally

“Increases nutrient and water retention”

WHY?

CDFA only allows these claims, so must label down to the most conservative state

- *Will need heavy metal testing for west coast states, and maybe pathogen testing*



Biochar Labeling Suggestions

- **Keep superfluous and unproven statements off the label**
- **Include claims related to soil amending and/or fertilization usage**
 - **Loftier and sustainability claims should be placed on tech sheets or website (not costly if have to stop using)**
 - **Keep industrial claims off the label**
- **Minimum weight / nutrient content**
- **Less text, is sometimes *more***

Understand states selling into, what they allow



Claim / Text Anomalies

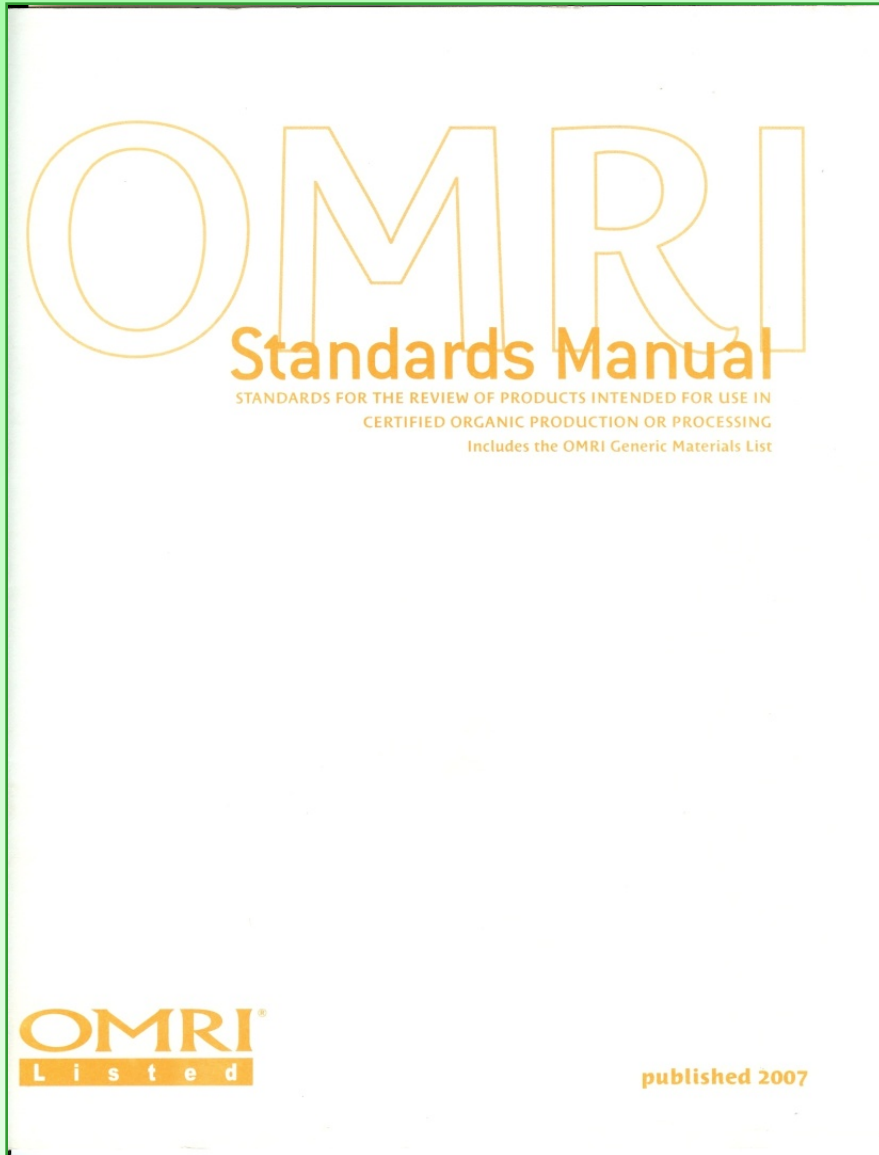
(Why do you find crazy claims on some labels?)

- Some biochar producers / marketers don't register their products (so never officially reviewed)
- Some states don't regulate soil amendments (so don't review)
- Many states do not do thorough label reviews, are 8-10 tough states

The more states you sell into, the more the label is scrutinized (risk)

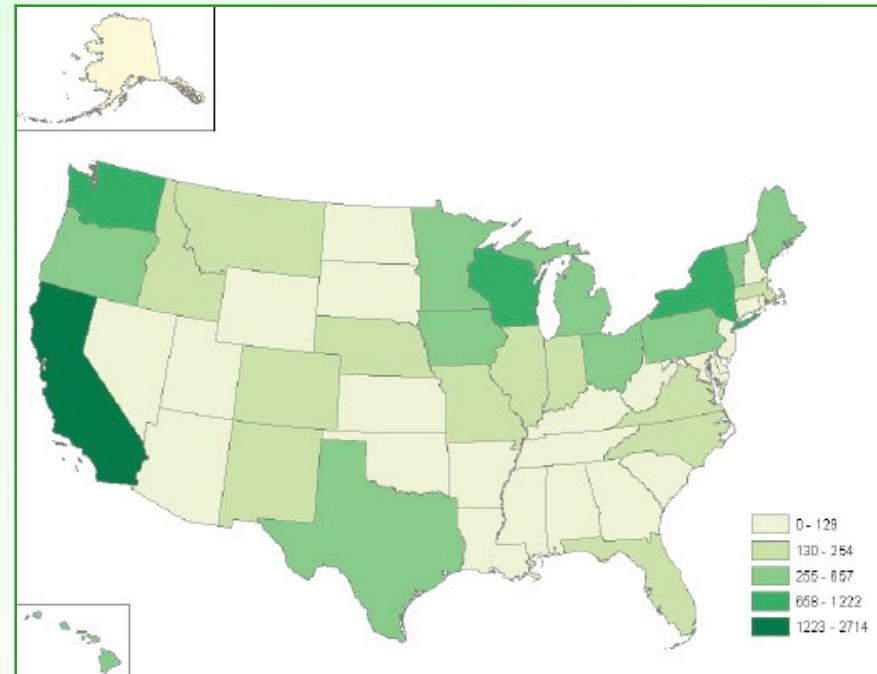


OMRI Listing



Allows for easier usage on certified organic farms

Greater interest in Lawn & garden products



Biochar

Status: Allowed

NEW

Class: Crop Fertilizers and Soil Amendments; Crop Management Tools and Production Aids

DESCRIPTION:

Biochar is biomass that has been carbonized or charred. Sources must be untreated plant or animal material. Biochar from manure is prohibited. Pyrolysis process must not use prohibited additives. See also ASH.

REVISION DATE: 04/23/2018

- *Will need heavy metal and pathogen testing for OMRI (or related org.) submittal*



Ashes

Status: Allowed

Class: Crop Fertilizers and Soil Amendments

Ash from plant and animal sources only. Ashes from burning minerals, manure, or prohibited materials are prohibited. See also MANURE ASH.

Products will be considered 'ash' if manure derived

REMEMBER - OMRI has no label authority (so just because they approve it, doesn't mean it's a legal label)



Conclusions

- **Consider product placement when you're developing your label – who selling to and where**
- **Remember, must meet labeling and registration laws in every state you sell into (even web sales)**
- **Understand labeling requirements and regulations before developing a label
(especially a costly a bag / package)**
 - **Be realistic and strategic with claims, especially on printed materials**
- **Seek assistance, unless willing to learn regulations 'on the fly' – Expense?**

Questions?

Ron Alexander

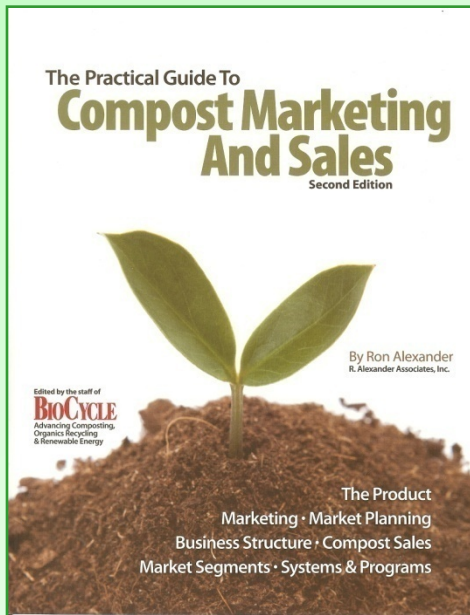
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