Nonconventional Soil Additives and Programs

John E. Sawyer

Iowa State University, jsawyer@iastate.edu

Follow this and additional works at: http://lib.dr.iastate.edu/cropnews

Part of the Agricultural Science Commons, Agriculture Commons, and the Agronomy and Crop Sciences Commons

Recommended Citation

http://lib.dr.iastate.edu/cropnews/768

The Iowa State University Digital Repository provides access to Integrated Crop Management News for historical purposes only. Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user. Users should make their own assessment of the information and whether it is suitable for their intended purpose. For current information on integrated crop management from Iowa State University Extension and Outreach, please visit https://crops.extension.iastate.edu/.
Nonconventional Soil Additives and Programs

Abstract
Every year products and programs are touted to Iowa producers as being the cure for crop production and economic woes. These seem to increase in number when crop prices are low or input costs are high. The old adage states “if it sounds too good to be true, then it probably is.” How do you know?

Keywords
Agronomy

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences

This article is available at Iowa State University Digital Repository: http://lib.dr.iastate.edu/cropnews/768
Nonconventional Soil Additives and Programs

by John Sawyer, Department of Agronomy

Every year products and programs are touted to Iowa producers as being the cure for crop production and economic woes. These seem to increase in number when crop prices are low or input costs are high. The old adage states “If it sounds too good to be true, then it probably is.” How do you know?

How do you know whether a particular product or program is a viable fertilizer and supplies crop nutrients, or has some proven effect on soil that will improve productivity or nutrient management? The standard advice is to demand unbiased research results that document all claims, and to discount testimonials. If well-documented research isn’t available, then be suspicious of seemingly extraordinary claims.

In Iowa, there are laws and rules administered by the Iowa Department of Agriculture and Land Stewardship (IDALS) for review and registration of fertilizer and soil conditioner products. So your first question should be, “Is this product registered for the claims made?” To find out, check with the IDALS Commercial Feed and Fertilizer Bureau by calling (515) 281-5321 or emailing feedandfertilizer@iowaAgriculture.gov.

Fertilizers

According to the Iowa Fertilizer Law (Chapter 200), the definition of fertilizer is “… any substance containing one or more recognized plant nutrient which is used for its plant nutrient content and which is designed for use and claimed to have value in promoting plant growth …” Fertilizers have a guaranteed analysis that is “… the minimum percentage of plant nutrients claimed and reported as total nitrogen (N), available phosphorus (P) or P2O5 or both, soluble potassium (K) or K2O or both …”

According to the Fertilizer and Agricultural Lime Rule (Chapter 43), specific additional plant food elements beside N, P, and K can be guaranteed: calcium, magnesium, sulfur, boron, chlorine, cobalt, copper, iron, manganese, molybdenum, sodium, and zinc. There is a minimum analysis requirement (Table 1). For mixed fertilizers, the sum of the guaranteed analysis of total N, available P2O5, and soluble K2O must be 20 percent or greater. Thus, materials below these levels cannot be registered as a fertilizer; however, this rule does not apply to specialty fertilizers for nonfarm use or materials ordinarily applied directly to plant foliage.
Table 1. Minimum percentage of nutrient content for fertilizers to be offered for sale, sold, or distributed in Iowa.

<table>
<thead>
<tr>
<th>Element</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen (N)</td>
<td>15</td>
</tr>
<tr>
<td>Phosphorus (P₂O₅)</td>
<td>18</td>
</tr>
<tr>
<td>Potassium (K₂O)</td>
<td>15</td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>1.00</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>0.50</td>
</tr>
<tr>
<td>Sulfur (S)</td>
<td>1.00</td>
</tr>
<tr>
<td>Boron (B)</td>
<td>0.02</td>
</tr>
<tr>
<td>Chlorine (Cl)</td>
<td>0.10</td>
</tr>
<tr>
<td>Cobalt (Co)</td>
<td>0.0005</td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>0.06</td>
</tr>
<tr>
<td>Iron (Fe)</td>
<td>0.10</td>
</tr>
<tr>
<td>Manganese (Mn)</td>
<td>0.05</td>
</tr>
<tr>
<td>Molybdenum (Mo)</td>
<td>0.0005</td>
</tr>
<tr>
<td>Sodium (Na)</td>
<td>0.10</td>
</tr>
<tr>
<td>Zinc (Zn)</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Adapted from Chapter 200 and 43, IDALS.

Soil conditioners

According to Chapter 200, the definition of soil conditioner is "... any substance which when added to the soil or applied to plants will produce a favorable growth, yield or quality of crop or soil flora or fauna or other soil characteristics, other than a fertilizer, recognized pesticide, unmanipulated animal and vegetable manures or calcium and magnesium carbonate materials used primarily for correcting soil acidity." According to Chapter 43, product claims may be substantiated by one of two methods: 1) efficacy testing or 2) available research data relevant to Iowa crops and soils.

Efficacy testing information includes:

1. Guaranteed ingredients;
2. Crop or soil response measured;
3. Research facility and investigators conducting trials;
4. Dates and locations of trials;
5. Trials conducted using the principles of experimental design and methods consistent with those in agricultural research, including raw data from proper treatment selection, replication, and randomization so that statistical analysis can be performed; and
6. No consumer testimonials.

Fertilizer and soil conditioners submitted for registration may be required to be tested for a minimum of two growing seasons in at least three Iowa crop reporting districts. The results of testing are reviewed by the secretary's pesticide and fertilizer advisory committee.

The bottom line is to ask whether a product being promoted is registered with the state, and if it isn't, then to question why and check with IDALS. Also, registrations can be reviewed to determine that a product meets the claims for which the registration was originally granted, and registrations can be cancelled if evidence exists that fraudulent or deceptive practices have been used.

Research Reports

A Web based comprehensive summary of research reports, titled "Compendium of Research Reports on Use of Non-Traditional Materials for Crop Production" are available for specific materials. The reports are maintained by the North Central Region Experiment Station committee NCR-103, "Non-Traditional Soil Amendments and Growth Stimulants."

The reports in the compendium are full-text searchable, so it is easy to locate reports on specific products or programs using the search feature. The compendium also contains regional extension publications covering specific products and programs. Those publications and other information on
nonconventional additives can also be accessed through the ISU Agronomy Extension Soil Fertility Web site.

The regional NCR-103 committee also compiles electronic access to a listing of "Nonconventional Soil Additives: Products, Companies, Ingredients, and Claims," product list. There is a link to this product list on the compendium Web site.

In summary
Be wary of products and programs with claims that seem extraordinary, relative to common wisdom and known research. In Iowa, we are blessed with highly productive soils that in general have many attributes to support good crop productivity, although they do often need fertilization and liming.

It is the rare soil amendment that might further enhance natural soil attributes. Supplementing the soil supply of crop nutrients when needed or replacing nutrients removed through crop harvest with guaranteed analysis fertilizer products, manure, or liming materials is a well-known and research supported activity. Attempting to change soils through soil amendments or specialty products for common field crop production typically is not well-documented and of uncertain economic benefit.

John Sawyer is a professor in agronomy with research and extension responsibilities in soil fertility and nutrient management.