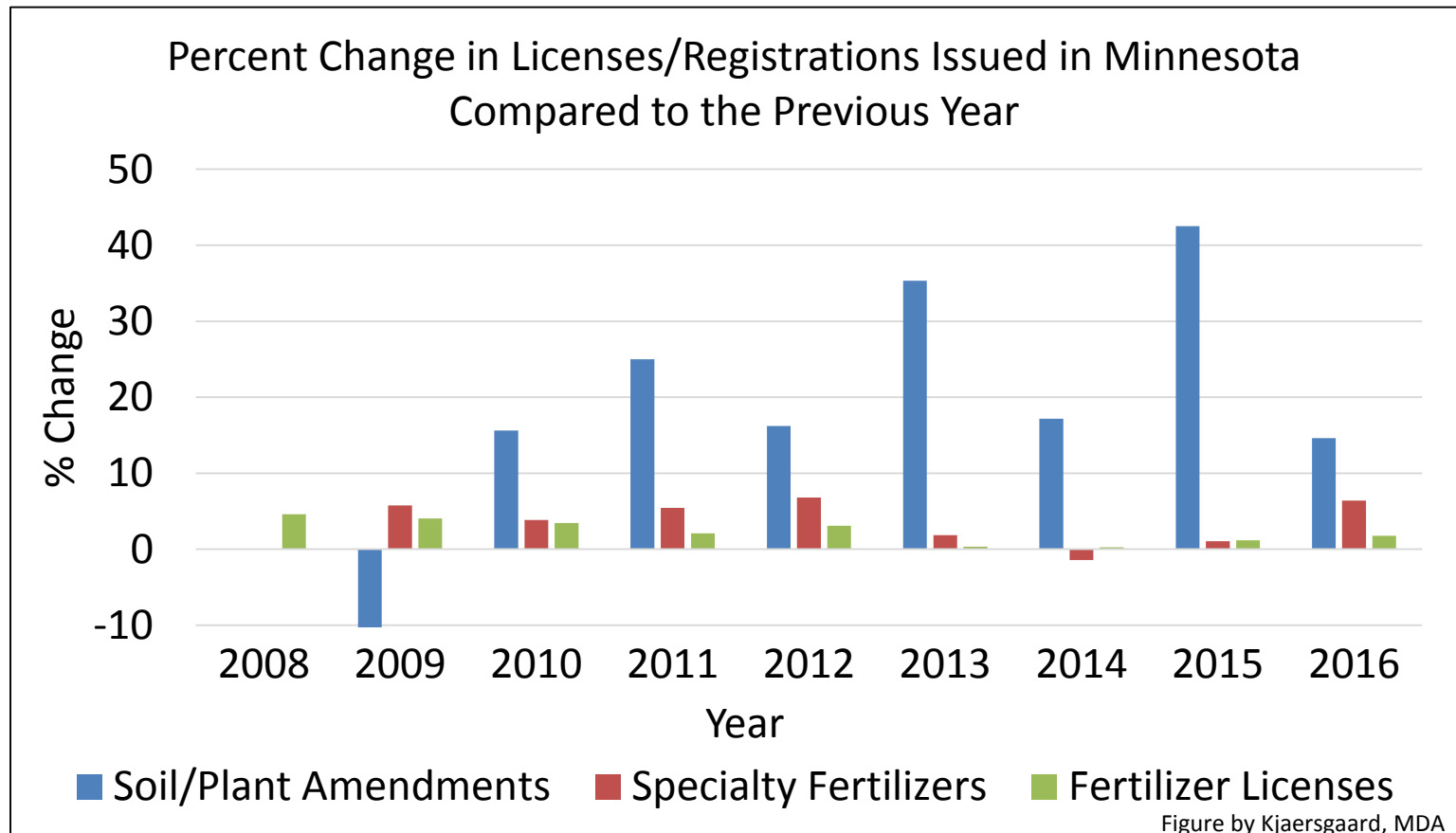


Keeping Track of Fertilizer and Soil and Plant Amendment Registrations

Carol Durden and Jeppe Kjaersgaard

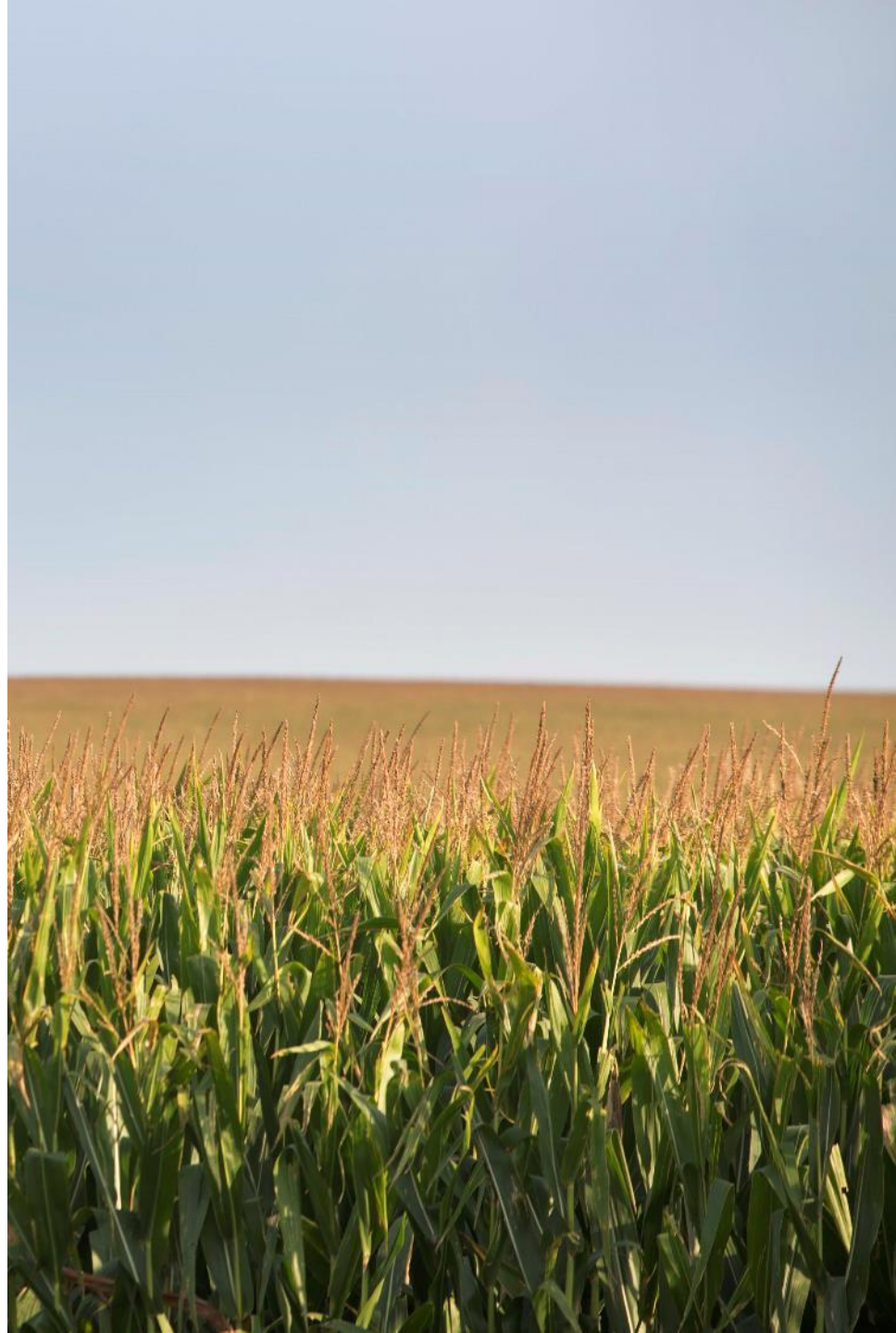
Minnesota Department of Agriculture

Increase in Licenses/Registrations



Outline

- Fertilizer and soil and plant amendment program
- Product categories
 - Fertilizer
 - Specialty fertilizer
 - Soil and plant amendments
 - Efficacy



Statute and Rules

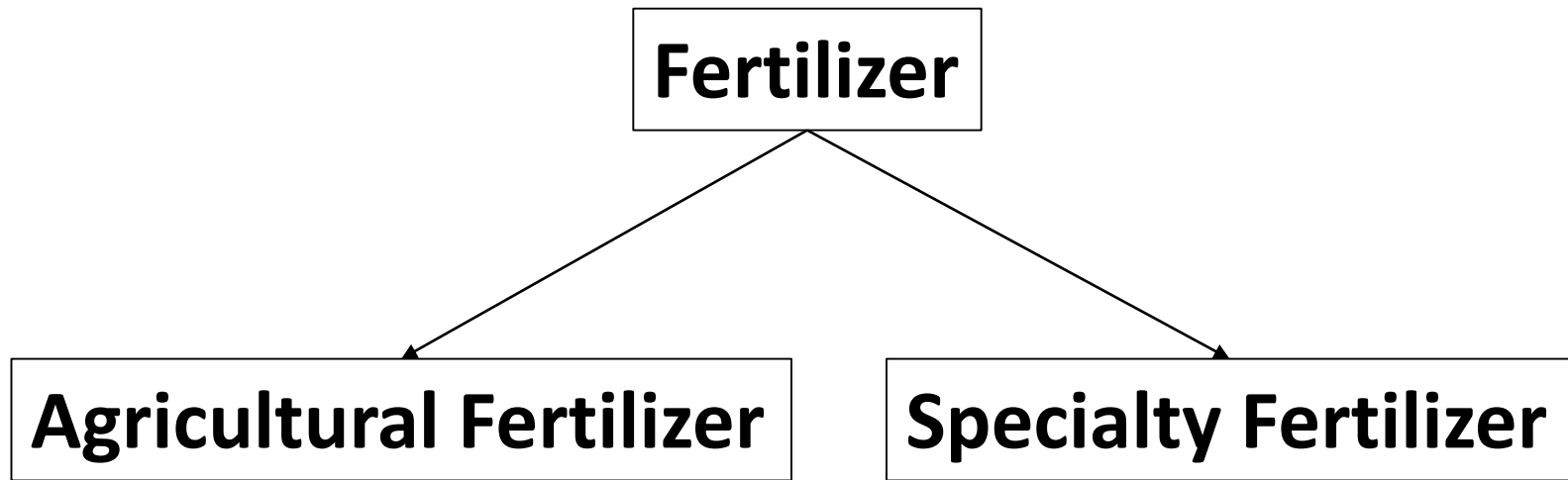
- Statute Chapter 18 C:
Fertilizer, Soil
Amendment, and Plant
Amendment Law
- MN Administrative
Rules Chapter 1510





FERTILIZERS

Fertilizers



Fertilizer

Definition

"Fertilizer" means a substance containing one or more recognized plant nutrients that is used for its plant nutrient content and designed for use or claimed to have value in promoting plant growth. Fertilizer does not include animal and vegetable manures that are not manipulated, marl, lime, limestone, and other products exempted by rule by the commissioner.

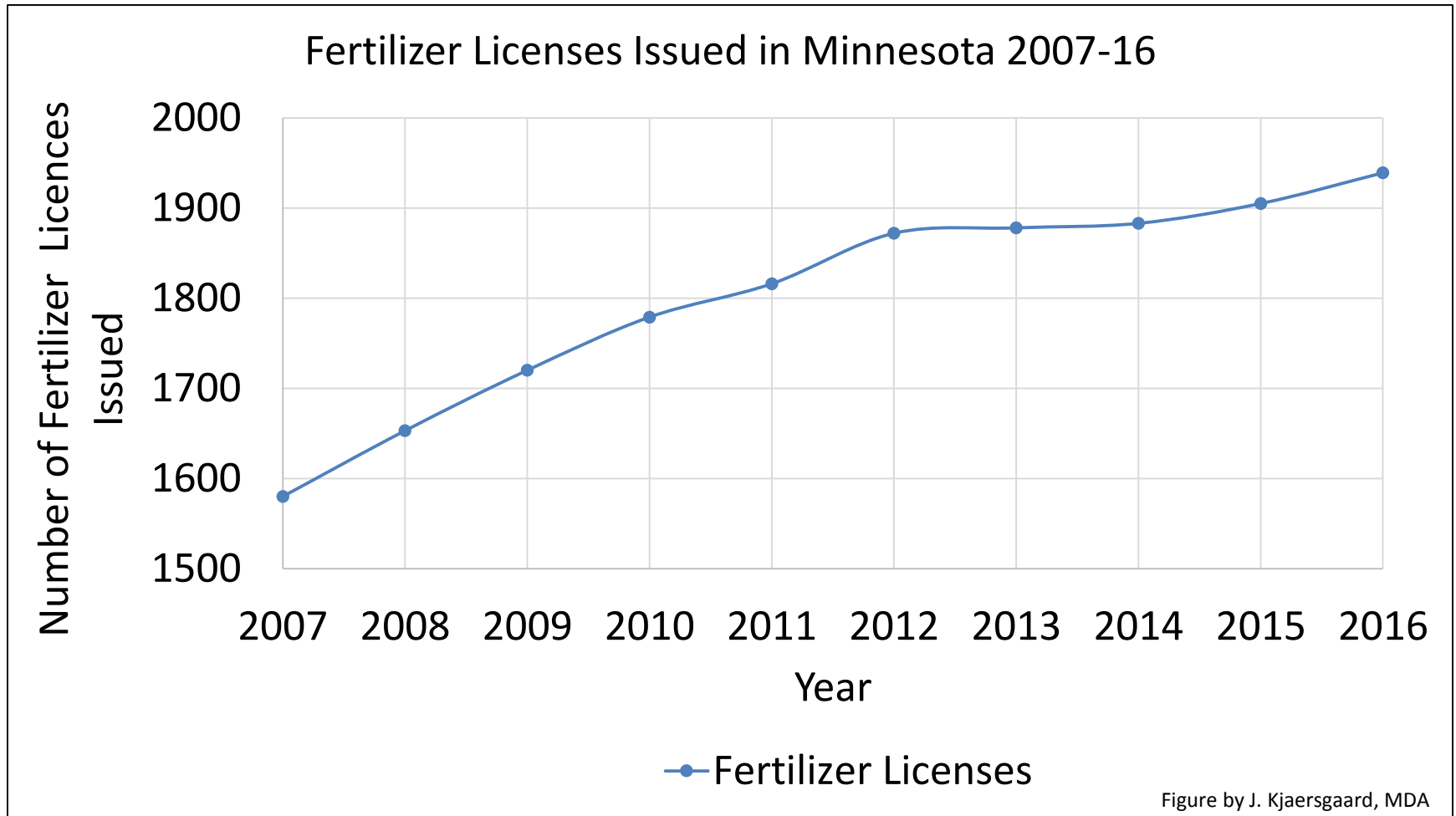


License Required

- A fertilizer license is required to
 - Sell, store or distribute bulk fertilizer for ag. land
 - Manufacture, blend or manipulate fertilizers
 - Custom apply fertilizers
- Annual fee:\$100
- One license per location
- One license covers multiple products



Increase in Licenses Issued



Specialty Fertilizer

Definition

"Specialty fertilizer" means a fertilizer labeled and distributed for, but not limited to, the following uses: greenhouses, nurseries, home gardens, house plants, lawn fertilizer, shrubs, golf courses, municipal parks, and cemeteries.

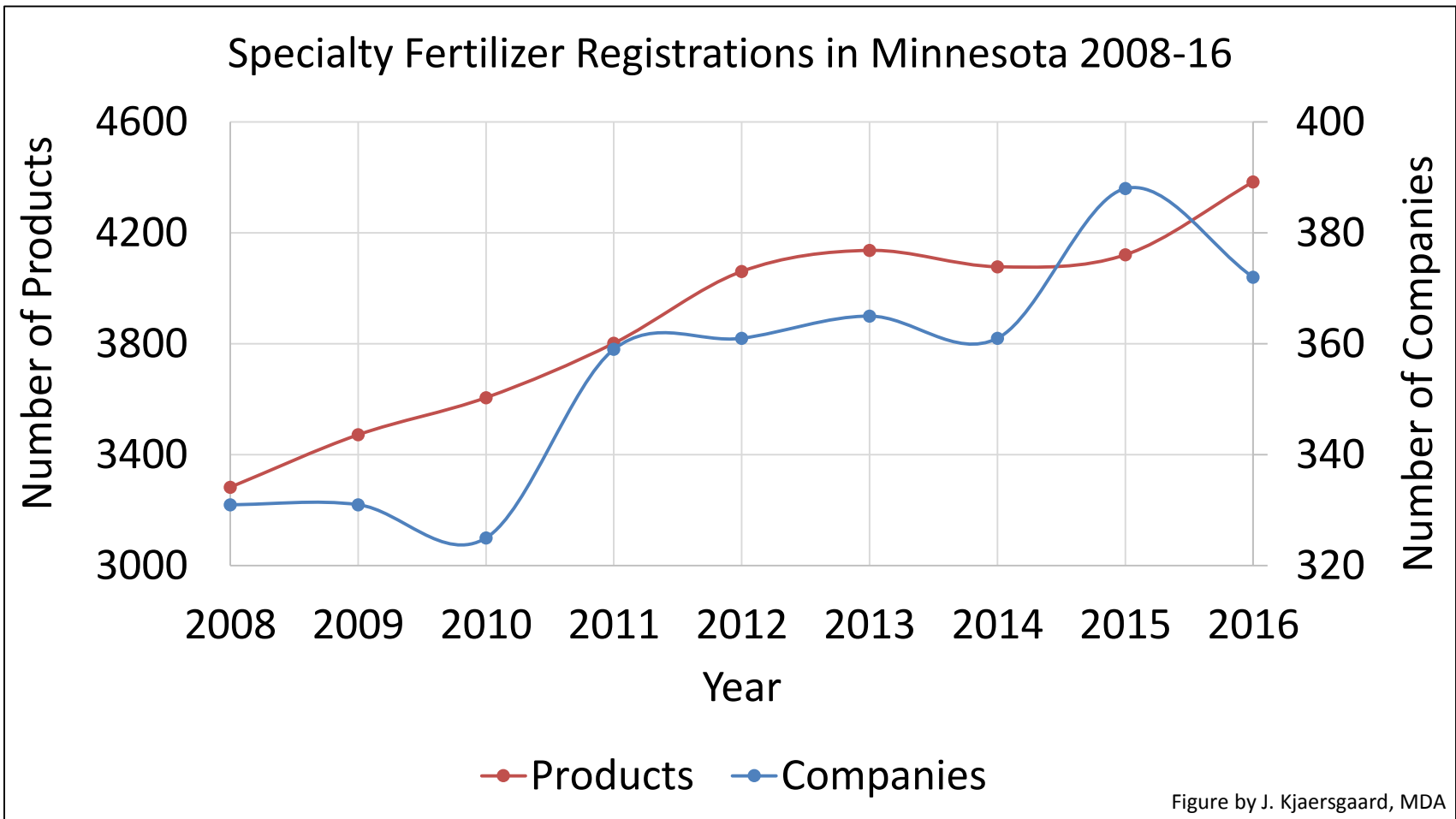


Registration Required

- A specialty fertilizer must be registered with the MDA
- Annual fee per product is \$100
- Labels must meet statutory requirements

Brand Name	SuperGro Supreme
Grade Statement	12-4-9
Guaranteed Analysis	<p>GUARANTEED ANALYSIS</p> <p>Total Nitrogen (N).....12%</p> <p>Available Phosphate (P₂O₅)4%</p> <p>Soluble Potash (K₂O)9%</p> <p>Calcium (Ca)x%</p> <p>Magnesium (Mg)x%</p> <p>Sulfur (S)x%</p> <p>Boron (B)x%</p> <p>Chlorine (Cl)x%</p> <p>Cobalt (Co)x%</p> <p>Copper (Cu).....x%</p> <p>Iron (Fe).....x%</p> <p>Manganese (Mn)x%</p> <p>Molybdenum (Mo)x%</p> <p>Nickel (Ni).....x%</p> <p>Sodium (Na)x%</p> <p>Zinc (Zn).....x%</p>
Derivation statement	Derived from: Ammonium Sulfate, Triple Super Phosphate, Sulfate of Potash Magnesia, Potassium Chloride, Calcium Sulfate, Boric Acid, Cobalt Sulfate, Copper Oxide, Iron Oxide, Manganese Sulfate, Sodium Molybdate, Nickel Oxide, and Zinc Oxide.
Directions for use	Directions for use:
Name and mailing address of Guarantor	<p>Farm Co-op</p> <p>Hwy 1, Box 7</p> <p>Centerville, Any State Zip Code</p> <p>Phone Number</p>
Net Weight	Net Weight – 25 lb (11.33 kg)

Increase in Registrations Issued



Fertilizer Label Requirements

- Brand name
- Guaranteed analysis
- Name and address of guarantor
- Net weight
- Label must be affixed to the container (e.g. bag) or as an invoice or delivery ticket (bulk)

In addition, for specialty fertilizers:

- Directions for use
- Derivatives statement
- Labels are reviewed for claims of usefulness or benefit, data may be required to substantiate claims

Investigational Allowances

A commercial fertilizer is deficient if the analysis of any plant nutrient is below the guarantee by an amount exceeding the values in the following schedule, or if the overall index value of the fertilizer is below 97 percent (1510.0420).

Examples of investigational allowances for N, P and K

Guaranteed %	Nitrogen %	Available Phosphate %	Potash %
6	0.52	0.67	0.47
10	0.58	0.69	0.70
28	0.83	0.74	1.33
34	0.88	0.76	1.44

Overall Index Value

The overall index value is calculated from the deficiency weighted by the commercial value of each nutrient.

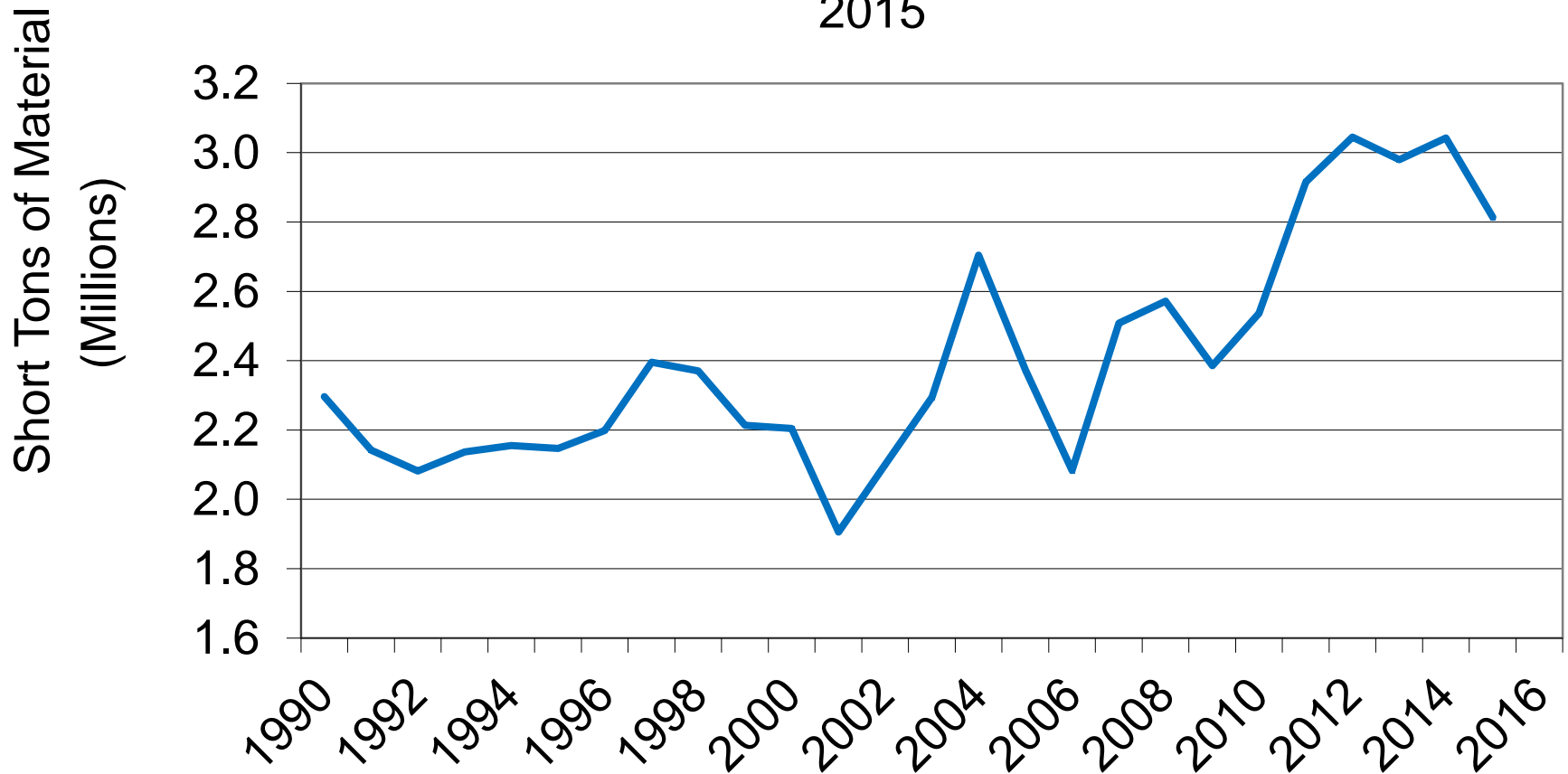
An example: Assuming a 2:2:1 cost ratio for N-P-K

	Commercial Value Guaranteed	Commercial Value Found
Units of N	10.0 x 2 = 20.0	9.7 x 2 = 19.4
Units of P ₂ O ₅	10.0 x 2 = 20.0	9.8 x 2 = 19.6
Units of K ₂ O	10.0 x 1 = 10.0	10.1 x 1 = 10.1
Sum	50.0	49.1

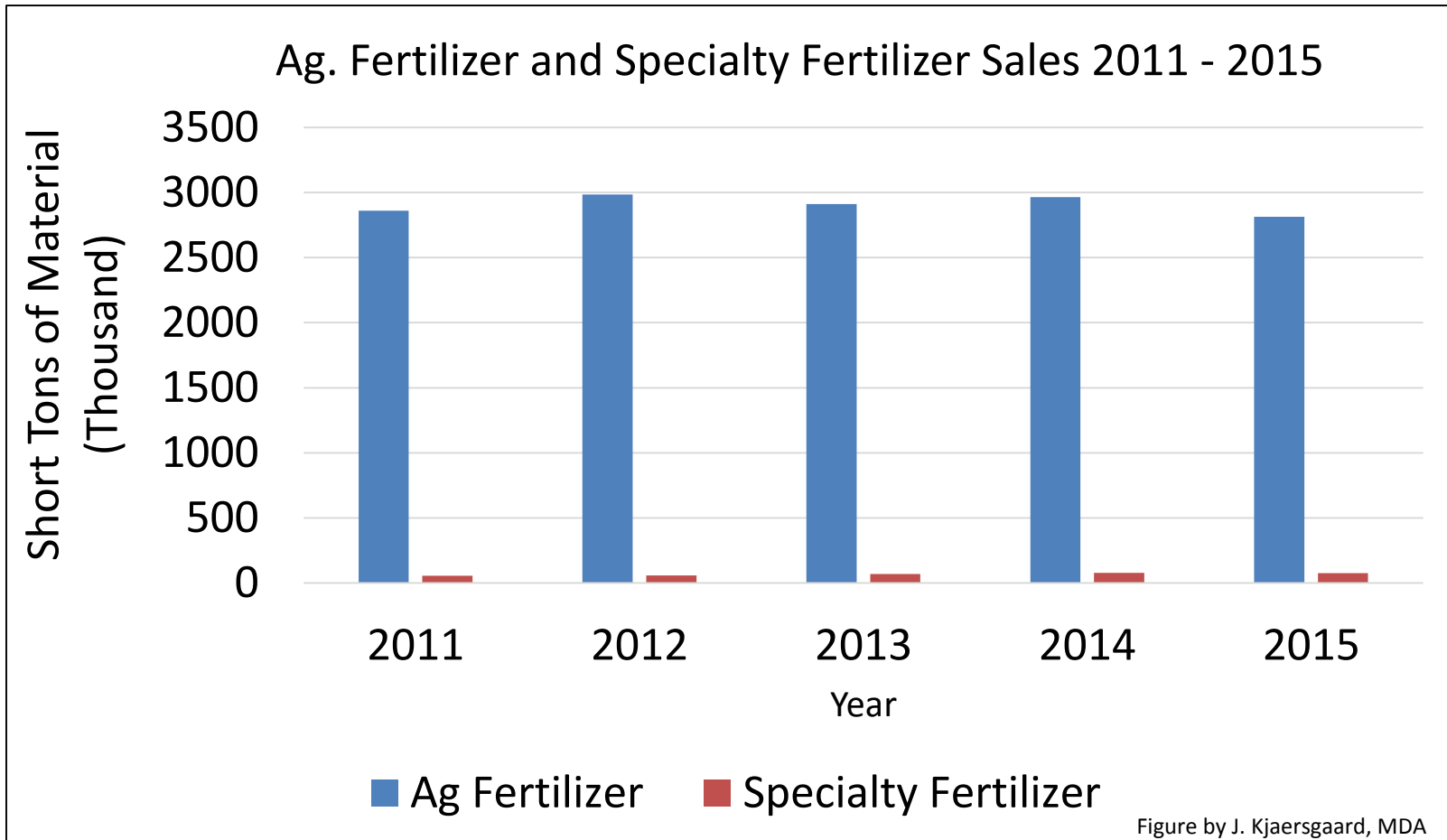
$$\text{Overall Index Value} = \frac{\text{Commercial Value Found (CVF)}}{\text{Commercial Value Guaranteed (CVG)}} = \frac{49.1}{50} = 0.98$$

Trends in Fertilizer Tonnage

Total Fertilizer Tonnage Sold in Minnesota from 1990 to 2015

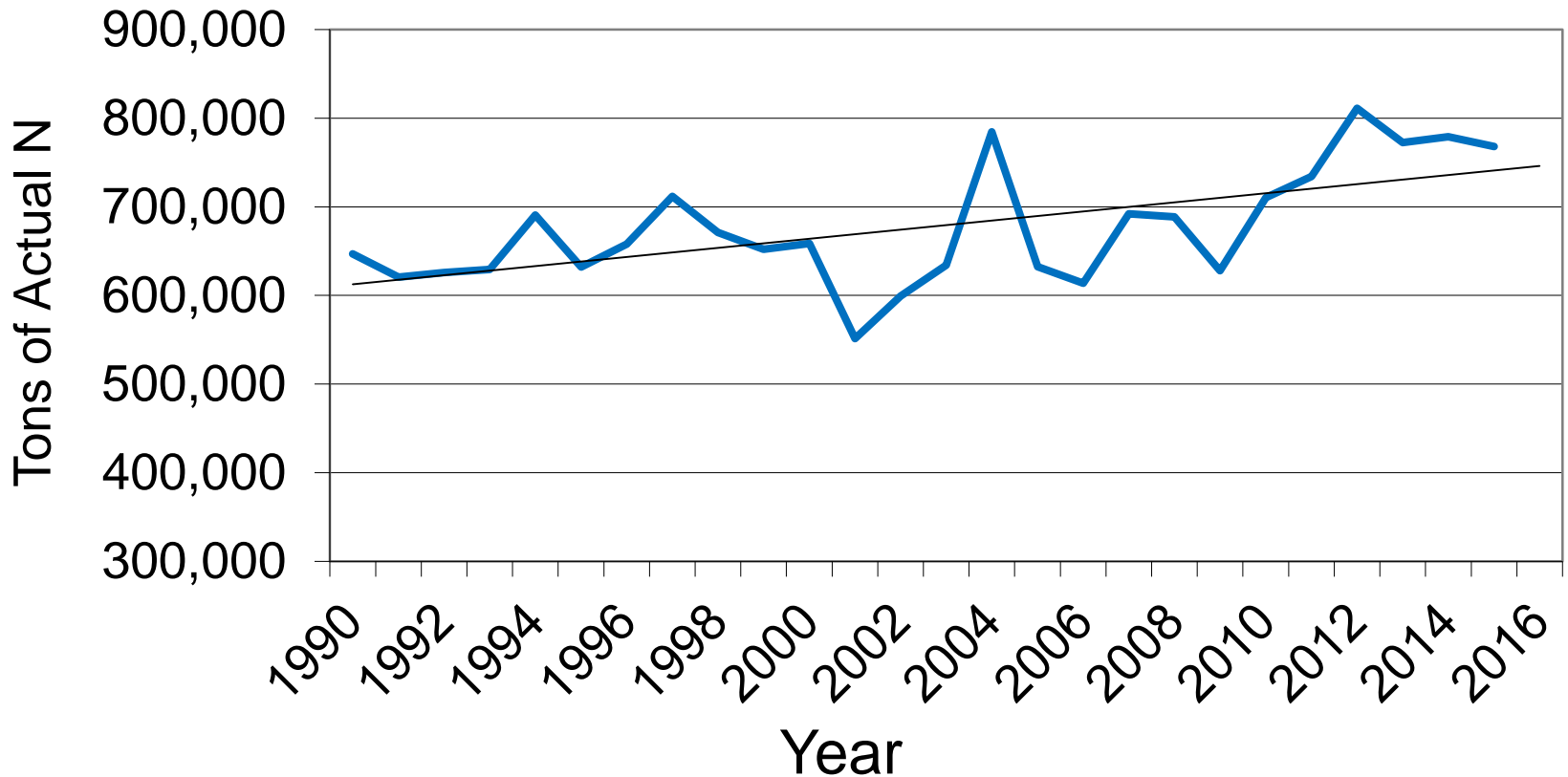


Ag. Fertilizer and Specialty Fertilizer

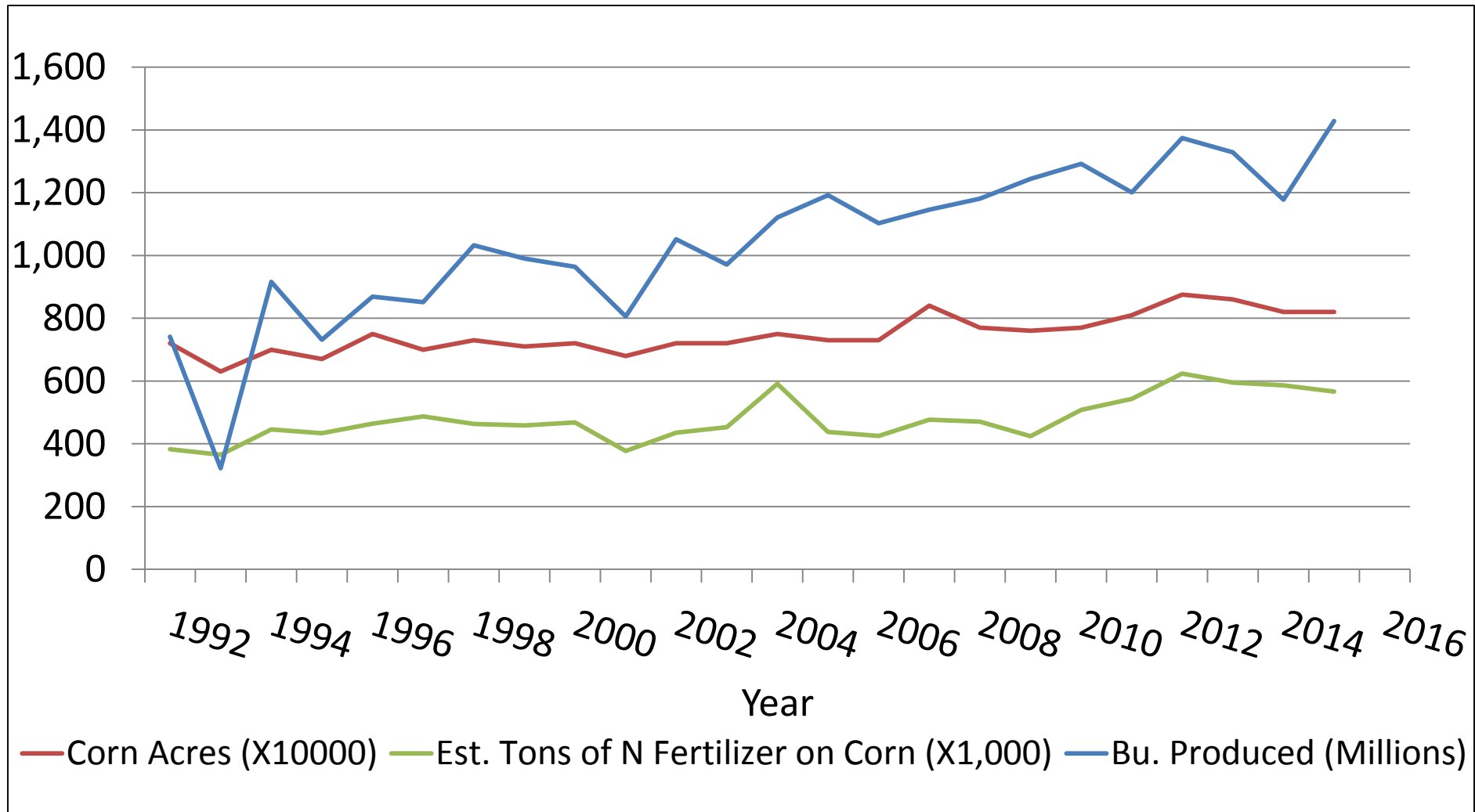


Trends in Nitrogen Fertilizer Sales

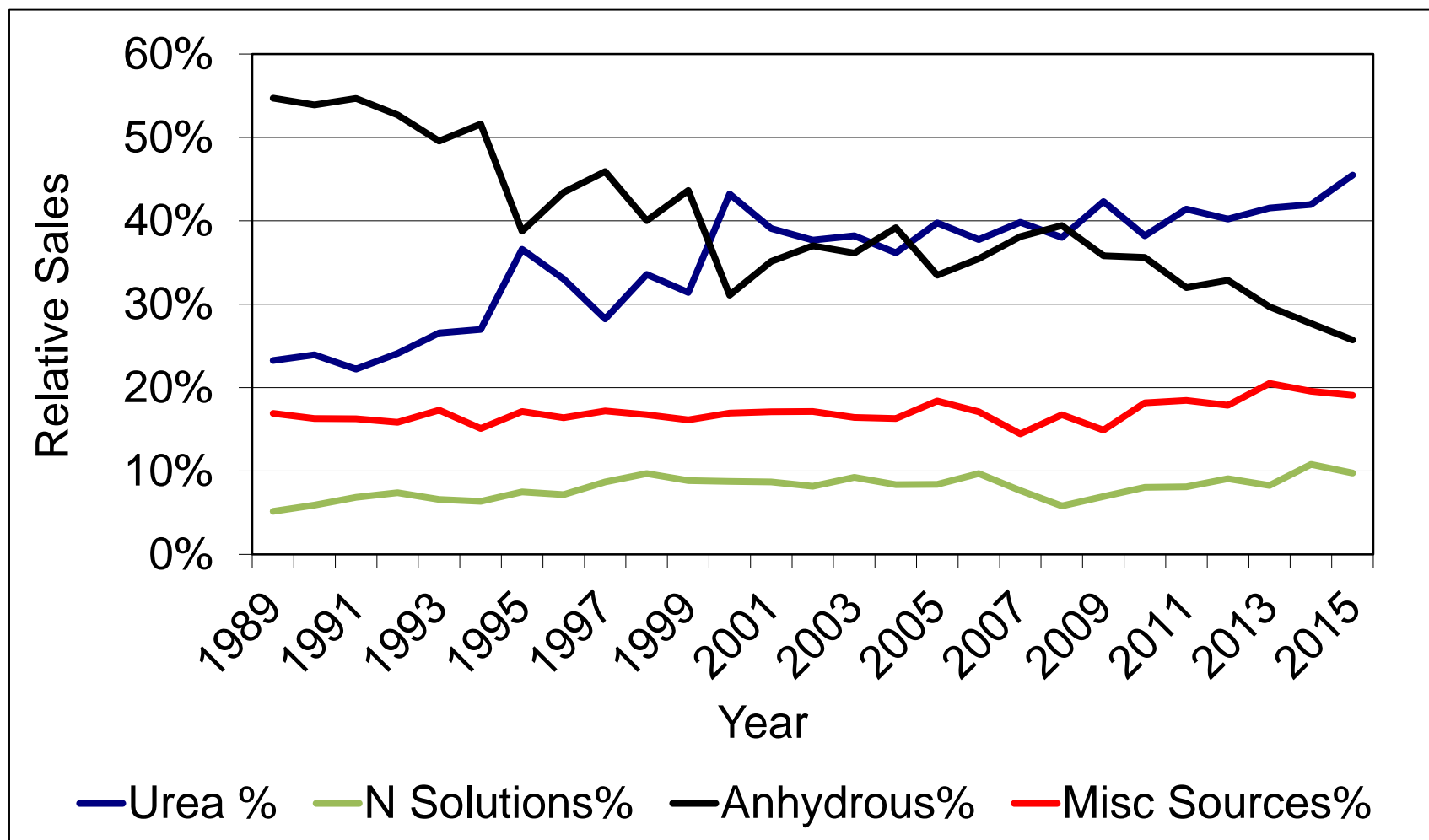
Agricultural Nitrogen Sales 1990 - 2015



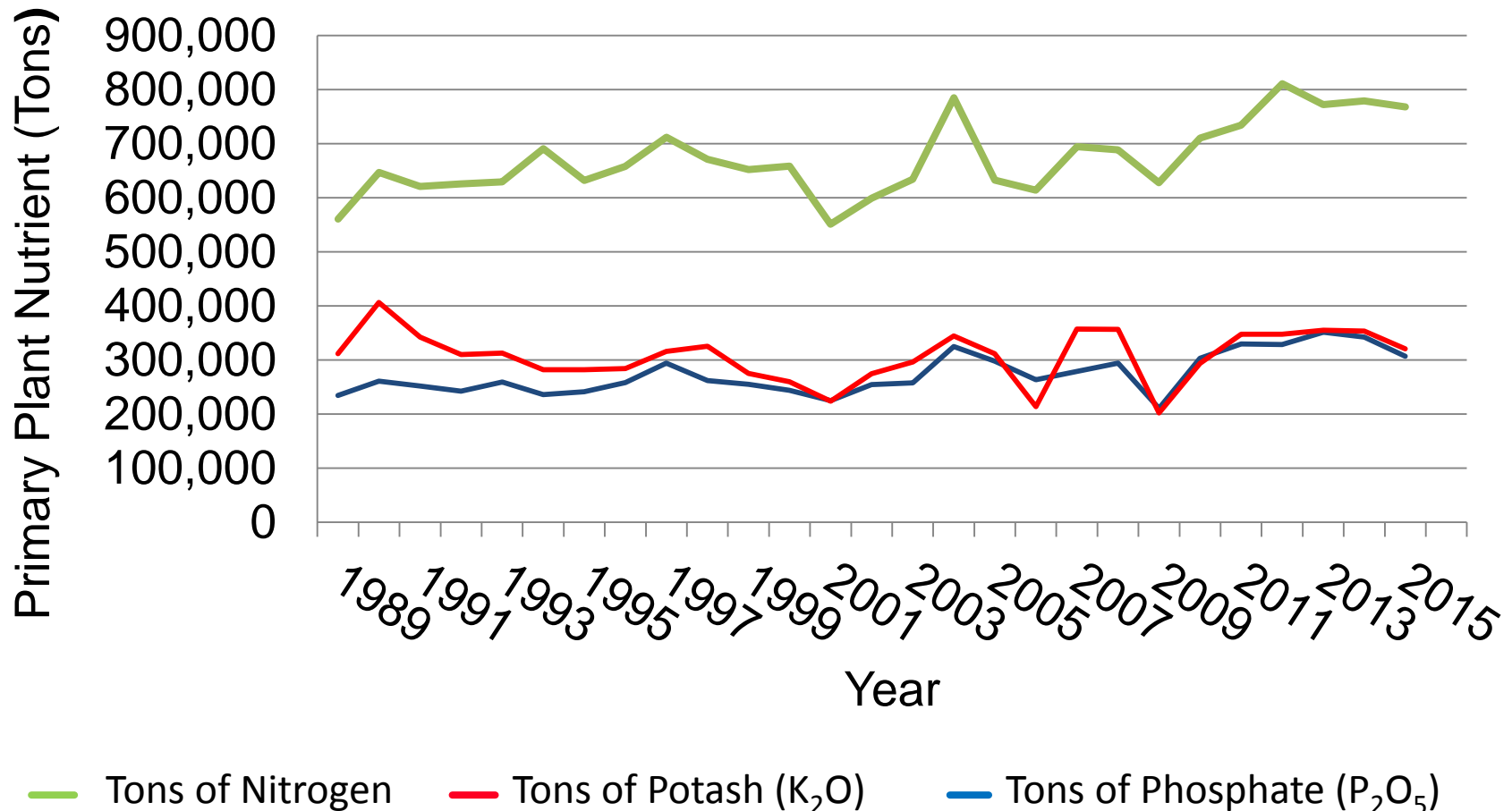
N Fertilizer Inputs and Production



Distribution in Nitrogen Fertilizer

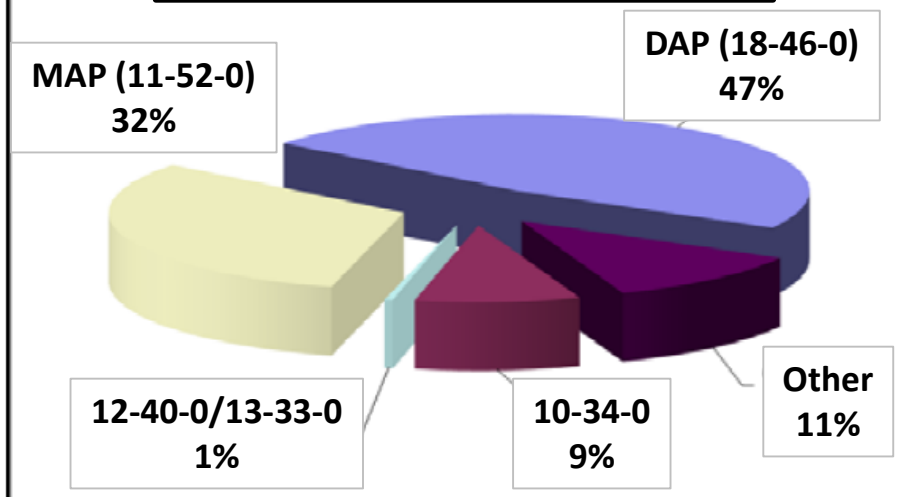


Trends in N, P and K

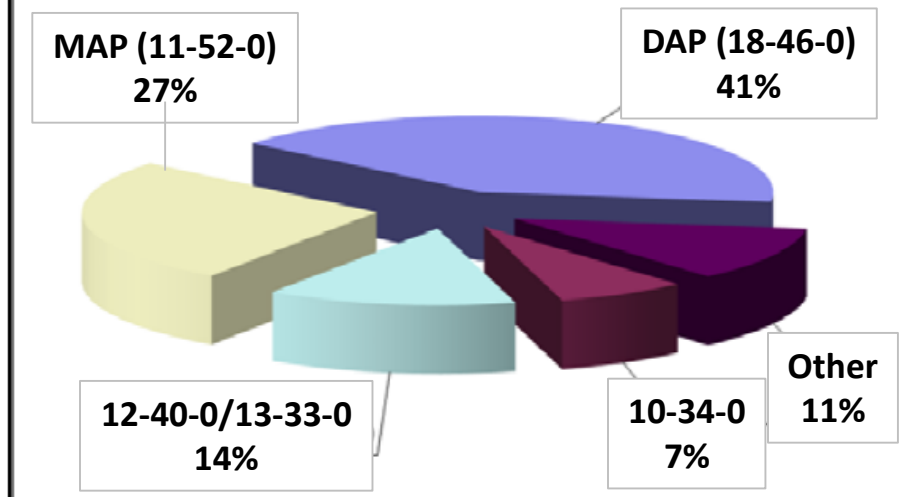


Distribution of Phosphate

Distribution of P_2O_5 for 2007
248,000 Tons on Nutrient



Distribution of P_2O_5 for 2015
273,000 Tons on Nutrient



SOIL AND PLANT AMENDMENTS

Soil Amendment

Definition

"Soil amendment" means a substance intended to improve the structural, physical, or biological characteristics of the soil or modify organic matter at or near the soil surface, except fertilizers, agricultural liming materials, pesticides, and other materials exempted by the commissioner's rules.



Plant Amendment

Definition

"Plant amendment" means a substance applied to plants or seeds that is intended to improve germination, growth, yield, product quality, reproduction, flavor, or other desirable characteristics of plants except fertilizers, soil amendments, agricultural liming materials, pesticides, and other materials that are exempted by rule.



Registration Required

- Soil and plant amendments must be registered with MDA
- Annual fee per product is \$200
- Labels must meet statutory requirements

Brand Name	SuperGro Soil Perfector
Guaranteed Analysis	<u>Guaranteed Analysis</u> Soil Amending Ingredients Name of ingredient.....x% Name of ingredient.....x% Total Other Ingredientsx%
Purpose Statement	Purpose statement: This product is intended to _____
Directions for use	Directions for use:
Name and mailing address of Guarantor	Farm Co-op Hwy 1, Box 7 Centerville, Any State Zip Code Phone Number
Net Weight	Net Weight – 25 lb (11.33 kg)

Soil/Plant Amend. Label Requirements

- Brand name
- Guaranteed analysis
- Name and address of guarantor
- Net weight
- Label must appear or be affixed to the container (e.g. bag) or provided to the purchaser (bulk)
- Directions for use
- Purpose
- Labels are reviewed for claims of usefulness or benefit, data may be required to substantiate claims

Amendments

Microorganisms

- Legume inoculants
 - Rhizobia
 - P solubilizing
 - Organic matter breakdown
- Bacteria
 - N fixing
 - P solubilizing
 - Organic matter breakdown
- Mycorrhizal fungi



Amendments

Organic fibrous materials

- Peat/sphagnum
- Compost
- Mulch
- Coconut coir
- Purpose:
 - Home use
 - Horticultural applications
 - Agricultural use
 - Seed potatoes



Amendments

Other organic products

- Humic substances
 - Humate
 - Humic acid
 - Fulvic acid
- Algae
- Biochar
- Purpose: May aid in micronutrient uptake

Humic Substance: The major organic constituents of soil organic matter and the aquatic environment, consisting of complex heterogeneous mixtures of carbon-based substances formed by biochemical reactions during the decay and transformation of plant and microbial remains. They are primarily composed of three main fractions, called humic acid, fulvic acid and humin, which are operationally defined by their solubility in dilute alkali and acid solutions. High concentrations of humic substances are commercially harvested from terrestrial deposits of Leonardite, oxidized lignite, oxidized sub-bituminous coals, humalite, carbonaceous shales peat and sapropel (AAPFCO official definition, 2015).



FULVIC ACID



HUMIC ACID

Amendments

Wetting agents and flocculants

- Surfactants
- Polymers and gels
- Flocculants

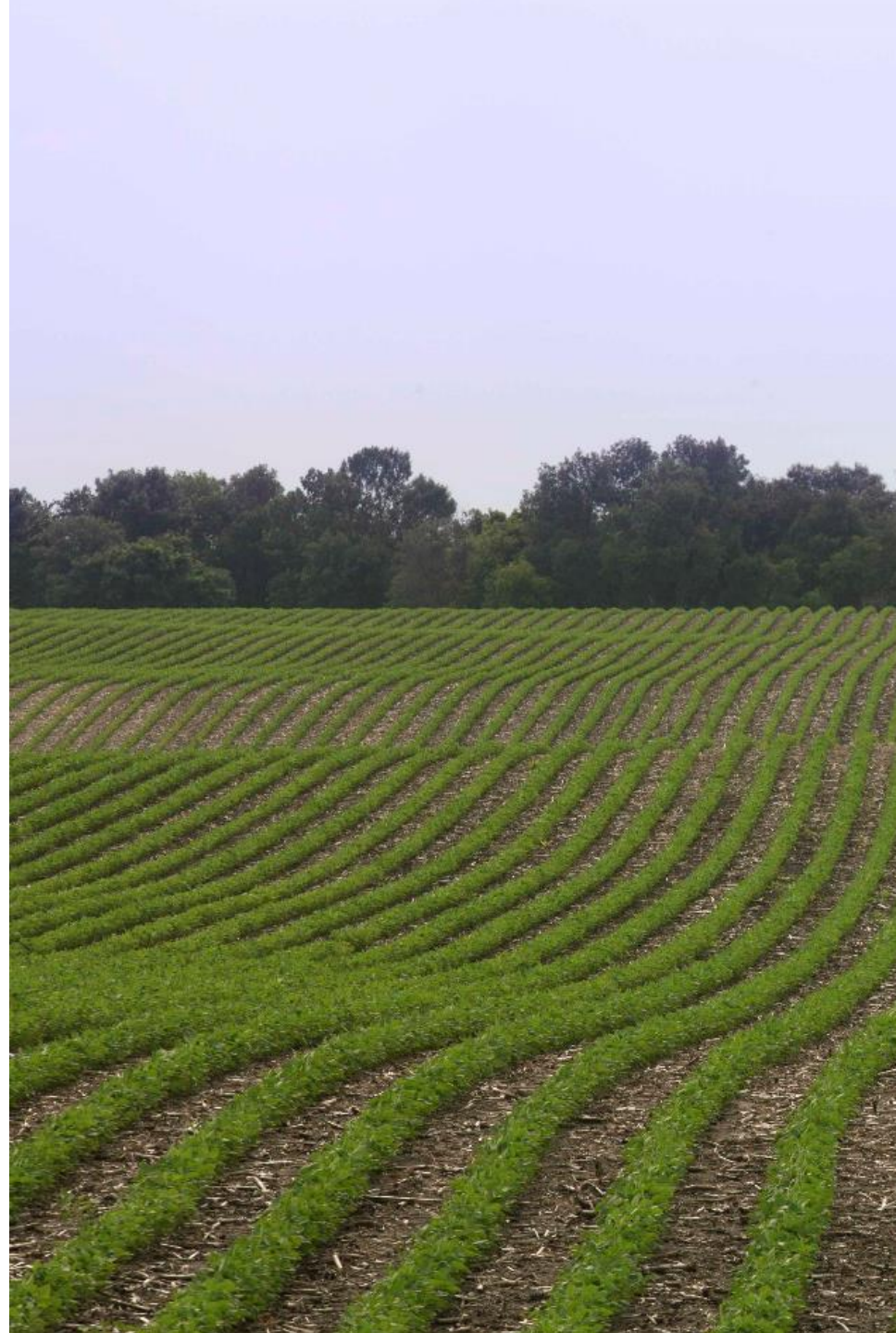
- Purpose:
 - Reduce surface tension
 - Increase soil water holding
 - Encourage soil flocculation



Amendments

Miscellaneous Enhancers

- Microbe food
- “Signaling” compounds
- Enzymes
- Purpose:
 - Enhance viability and vitality of microorganisms
 - Enhance crop’s nutritional capacity



Amendments

Gypsum

- Common sources:
 - Mined
 - Flue-gas desulfurization
 - Recycle gypsum products
- Purpose:
 - Help improve soil structure
 - Reclaim high-sodium soil
 - Source of sulphate



Amendments

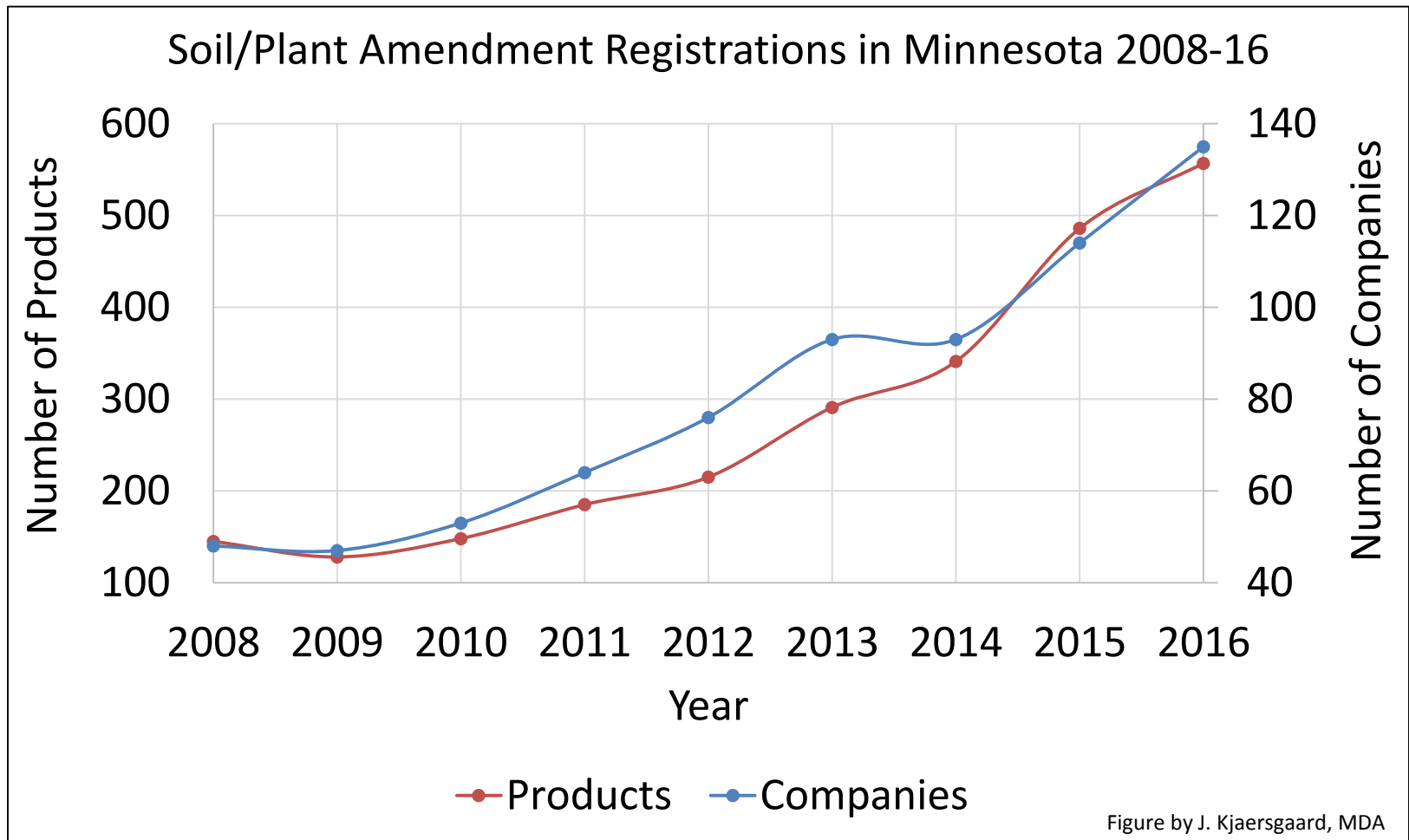
Not soil/plant amendments

- Nitrogen stabilizers
 - Urease inhibitors
 - Nitrification inhibitors
- Maleic-Itaconic Copolymer
- Some active ingredients are considered pesticides, such as Nitrapyrin





Increase in Registrations Issued



Registrations by Product Category

**Categories of Soil and Plant Amendments Registered or in Application
in Minnesota as of February 6, 2017**

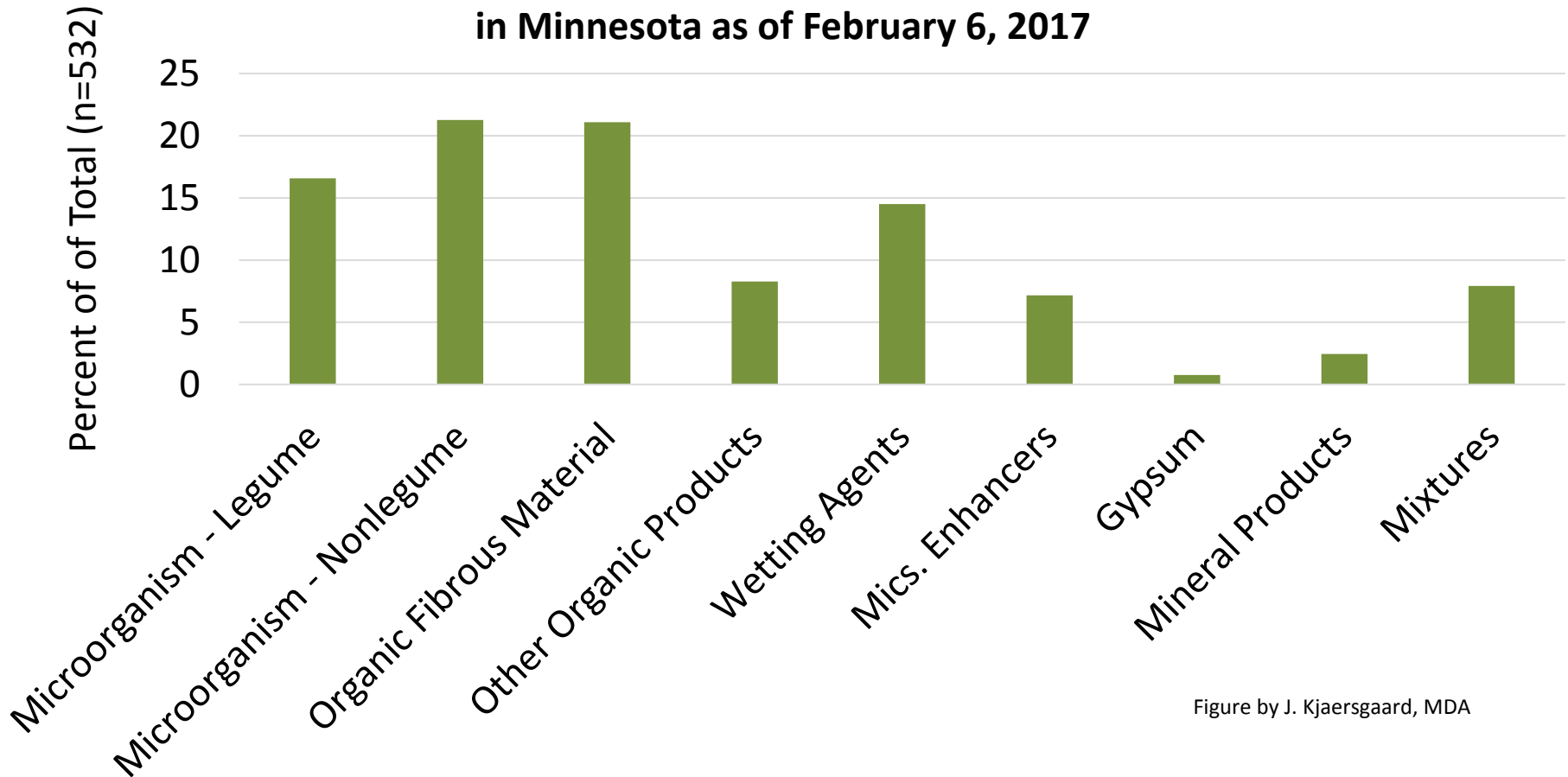


Figure by J. Kjaersgaard, MDA

Distribution by Product Category

Reported Soil and Plant Amendment Sales July 1, 2014 – June 30, 2015

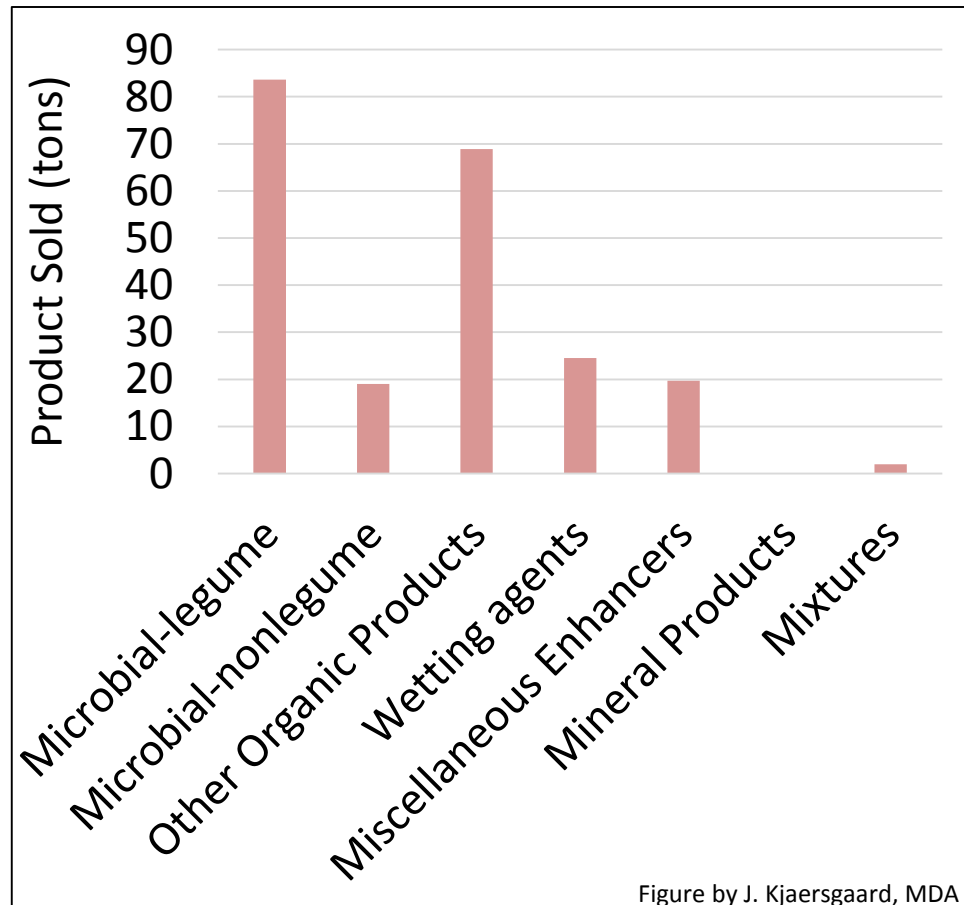
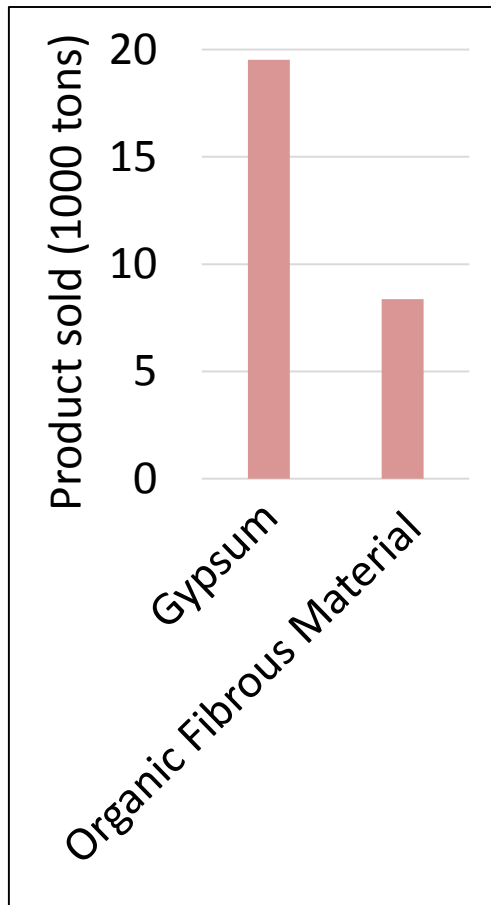
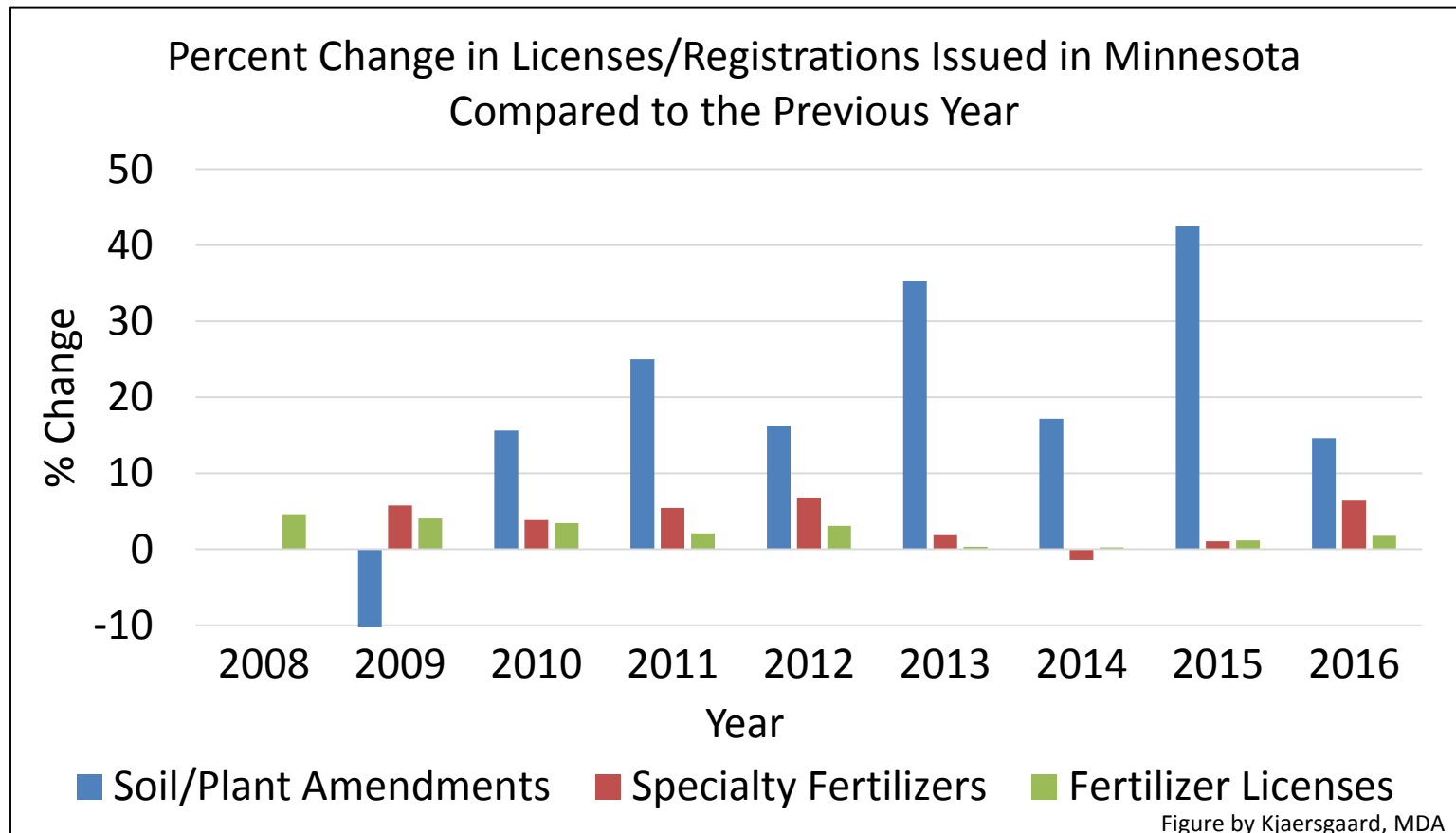


Figure by J. Kjaersgaard, MDA

Product License/Registration Summary

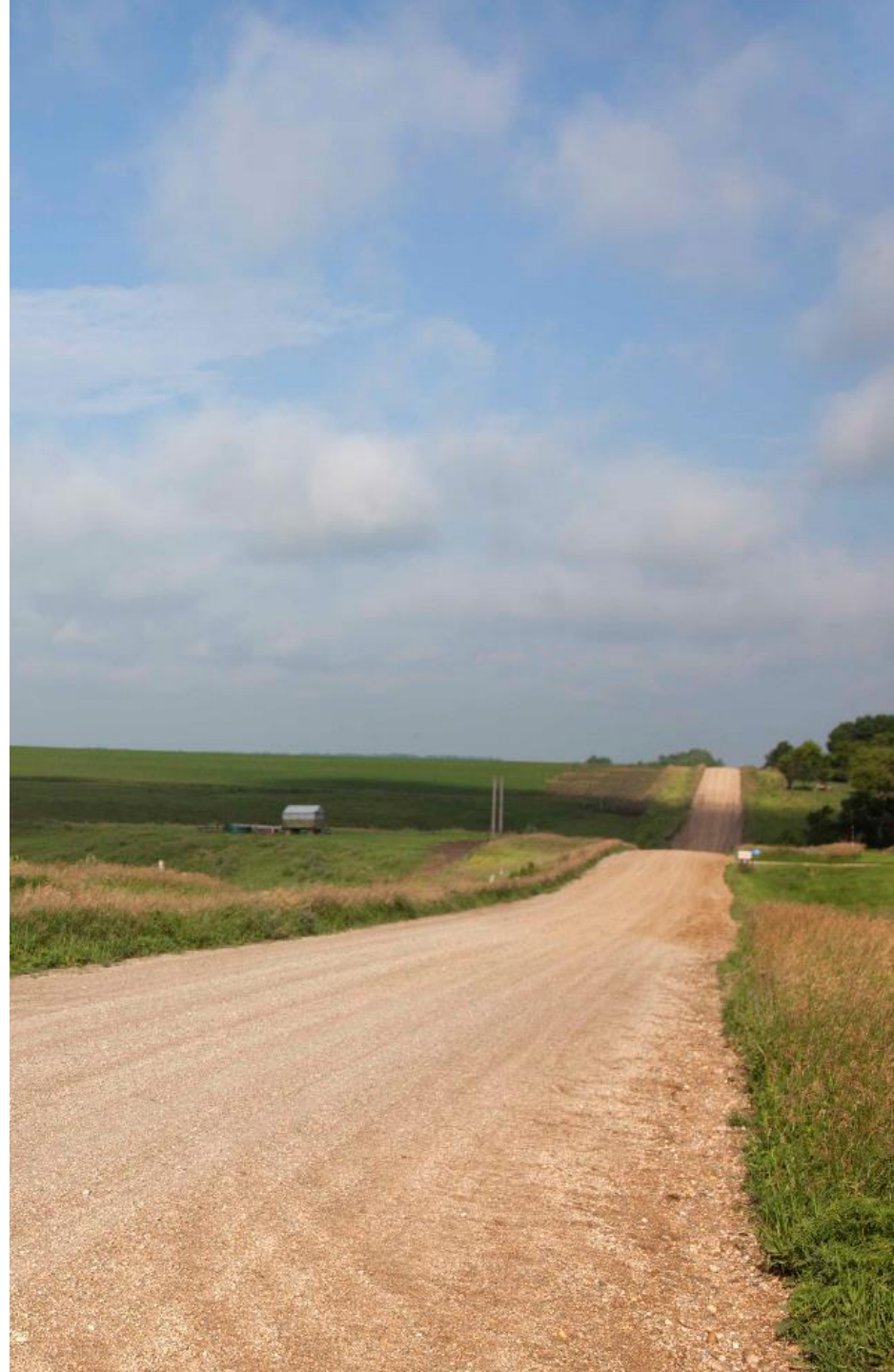
	License Required	Product Registration Required	Fee (Annually)
Fertilizer	Yes	No	\$100
Specialty Fertilizer	No	Yes	\$100
Soil and Plant Amendment	No	Yes	\$200

Increase in Licenses/Registrations



Tonnage Fee

- Tonnage of fertilizer, specialty fertilizer and soil and plant amendments sold must be reported each year
- \$1.09/ton tonnage fee
 - \$0.39 Inspection fee
 - \$0.40 AFREC
 - \$0.30 ACCRA (Ag Chemical Response and Reimbursement Account)





AFREC

Agricultural Fertilizer Research & Education Council

- Farmer-led program
- 12-member board
- Supports soil fertility
 - research
 - technology development
 - education
- <http://mnsoilfertility.com/>



Agricultural Fertilizer Research & Education Council

RESEARCH TOPICS

Choose a research topic below to easily find the specific information you're looking for.

ALL TOPICS

ALFALFA

SOIL QUALITY

MICRONUTRIENTS

WATER

ALL TOPICS



CURRENT



COMPLETED

[Urea and Urea Additives as Fertilizer Sources for Corn Production in Minnesota](#)

[Nitrogen Response and Soil Microbial Activity in Potato Cropping Systems as Affected by Fumigant](#)

[Evaluation of Variable Rate Nitrogen Technologies for Corn in Minnesota](#)

[Potassium Fertilization of Corn and Soybean](#)

[Efficient Nitrogen Fertilization for Cultivated Wildrice Varieties](#)

[Perennial Ryegrass Growth, Development and Seed Yield Influenced by Phosphorus Source Rate](#)

[Optimizing Nitrogen Management for Processing Sweet Corn Production on Fine-Textured Soils](#)

[Further Development of Web and Print Extension Materials for Nutrient Management in Minnesota](#)

[Control over Fundamental Soil N Cycling Process in Minnesota Cropping Systems: Nitrification, N](#)

[Advancing Intensive Management of Continuous Corn on Irrigated Sands](#)

[Development and Test of Potassium Management Algorithms for Corn](#)

[Phosphorus Availability and its Relationship to Sorption Maximum and Sorption Strength](#)

[Advancing Intensive Management of Corn Systems in Minnesota](#)

[Optimizing Use of Polymer-Coated Urea for Irrigated Potato Production and the Effects on Nitrate](#)

[Effects of Nitrogen Application Timing on Corn Production and Soil Quality](#)

[Plant Analysis as a Management Tool for Corn and Soybean Fields](#)

[Evaluation of In-Furrow Starter Fertilizer Sources for Corn](#)

[Long-Term Soil Test Monitoring in Minnesota Cropping Systems](#)

[Improving Predictability and Adoption of Alfalfa N Credits for Corn](#)

[Evaluation of the Minnesota Soil Health Index for Corn and Soybean](#)

Product Efficacy

- Some active ingredients may not have a proven track record or insufficient ingredients
- If in doubt, consult e.g.
 - U of M Extension
 - Trusted crop advisor
 - or lay out your own test plots

Genus	Lab Analysis	Label Guarantee
<i>Bacillus spp.</i>	30,000 cfu/g	5,810,000 cfu/g
<i>Glomus spp.</i>	9 prop/g	16.4 prop/g
<i>Bacillus spp.</i>	170,000 cfu/g	11,300,000 cfu/g
<i>Glomus spp.</i>	5 prop/g	66 prop/g
<i>Bacillus</i>	Oregon Department of Agriculture's 2015 analysis: The microorganism counts of 22 out of 27 products tested was lower than the label guarantee	
<i>Bacillus</i>		0 cfu/ml
<i>Bacillus</i>		00 cfu/g
<i>Pseudo</i>		00 cfu/g
<i>Trichod</i>		00 cfu/g
<i>Glomus</i>		2 prop/g
<i>Glomus spp.</i>	10 prop/g	03 prop/g
<i>Glomus spp.</i>	556 prop/ml	953 prop/ml
<i>Bacillus spp.</i>	47,000 cfu/ml	35,010,000 cfu/ml
<i>Bacillus spp.</i>	53,000 cfu/ml	35,010,000 cfu/ml

Product Efficacy

- Examples of online resources:
 - American Association of Plant Food Control Officials (AAPFCO) (<http://www.aapfco.org/>)
 - NCERA 103 Non-Traditional Soil Amendments and Growth Stimulants (<http://extension.agron.iastate.edu/compendium/index.aspx>)
 - Nutrient Star (<http://nutrientstar.org/>)
 - Past presentations from this conference and the nitrogen conference (<https://mawrc.org/events/>)



MN Department of Agriculture Product Database

<http://www2.mda.state.mn.us/webapp/lis/productsdefault.jsp>

www2.mda.state.mn.us/webapp/lis/productsdefault.jsp

MINNESOTA DEPARTMENT OF AGRICULTURE

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Registered Product Search

The Minnesota Department of Agriculture attempts to provide the most accurate data possible on this website. However, there may be errors due to data entry or other reasons. The Minnesota Department of Agriculture gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of this data. The information contained in this data is dynamic and will change over time. It is the responsibility of the data user to verify the data and to use the data appropriately and consistently within these limitations. This disclaimer applies both to individual use of the data and aggregate use with other data.

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Company Name: (Optional)

If you're not sure how a name begins, type a percent sign (%) in front of it.
If you're not sure how a name ends, only type the beginning of it. Do not include a percent sign.

Product Name: (Optional)

Initial Reg Year - MDA Product Number: (Both Fields Optional)

-

☒ Unexpired Licenses Only (Uncheck to select all licenses)

Please select either Pesticide Registration, Soil and Plant Amendment Registration, or Specialty Fertilizer Registration below.

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Research Scientist
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