Keeping Track of Fertilizer and Soil and Plant Amendment Registrations

Carol Durden and Jeppe Kjaersgaard

Minnesota Department of Agriculture

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Increase in Licenses/Registrations

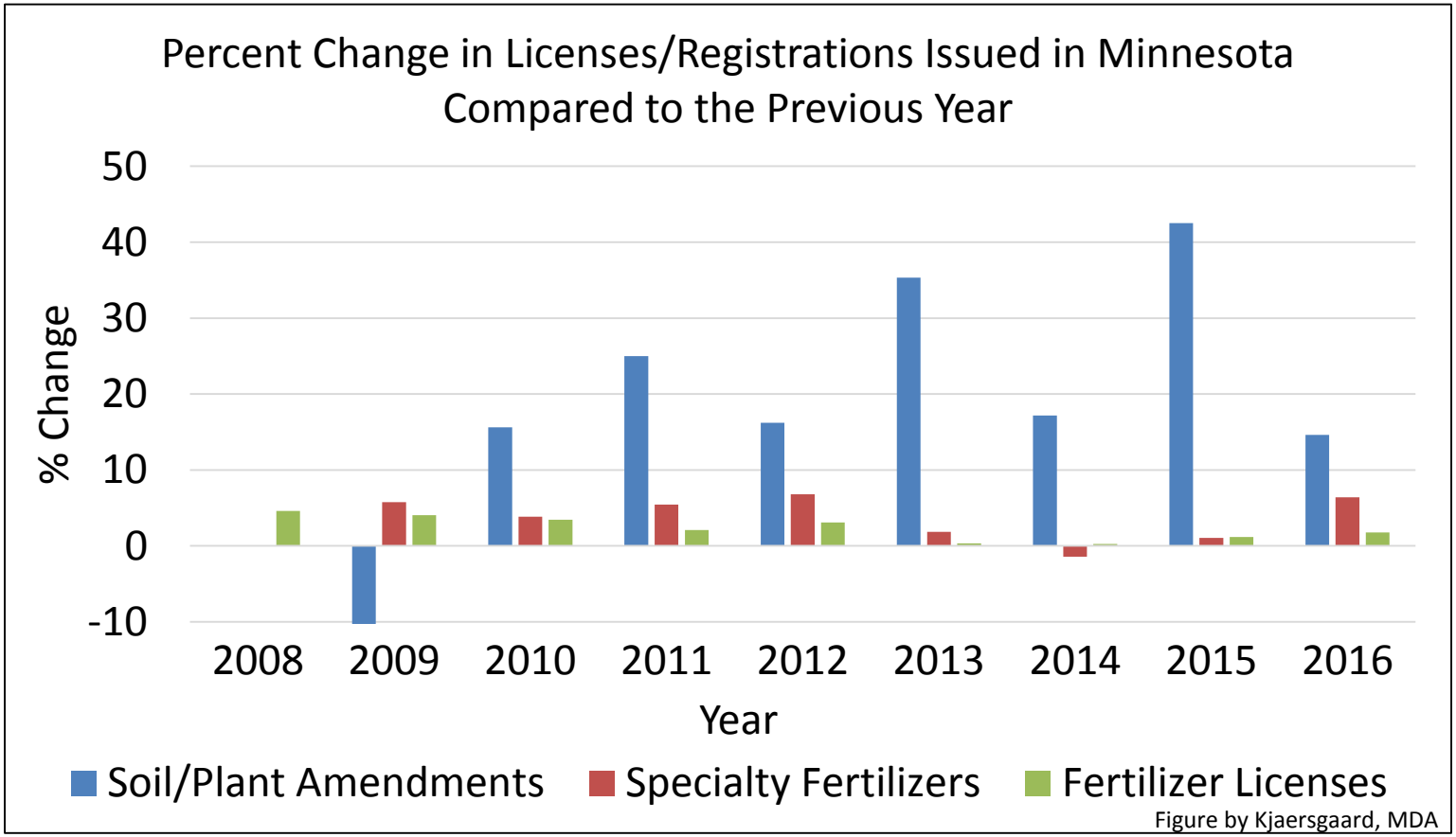

Figure by Kjaersgaard, MDA

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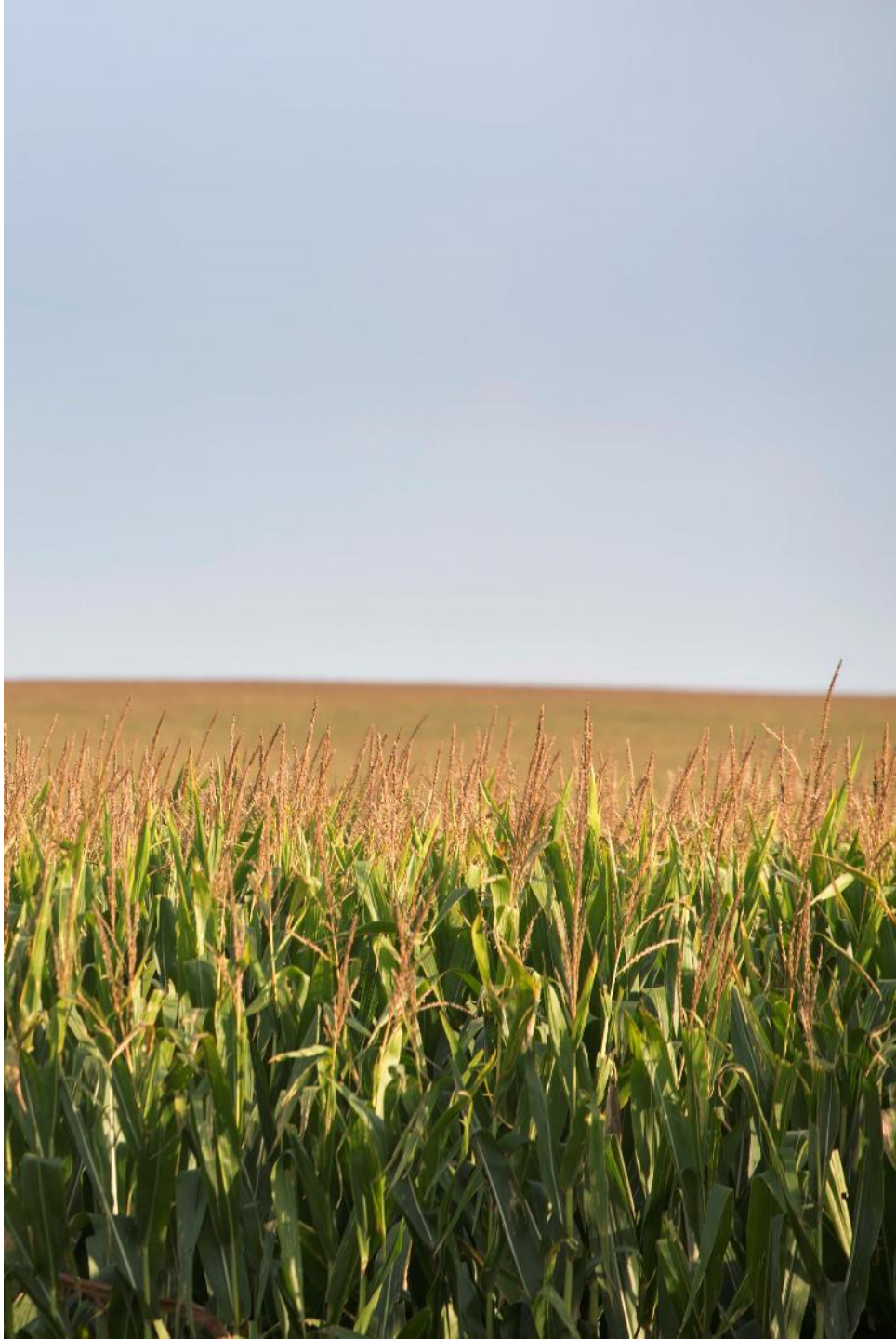
Outline

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



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Statute and Rules

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

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FERTILIZERS

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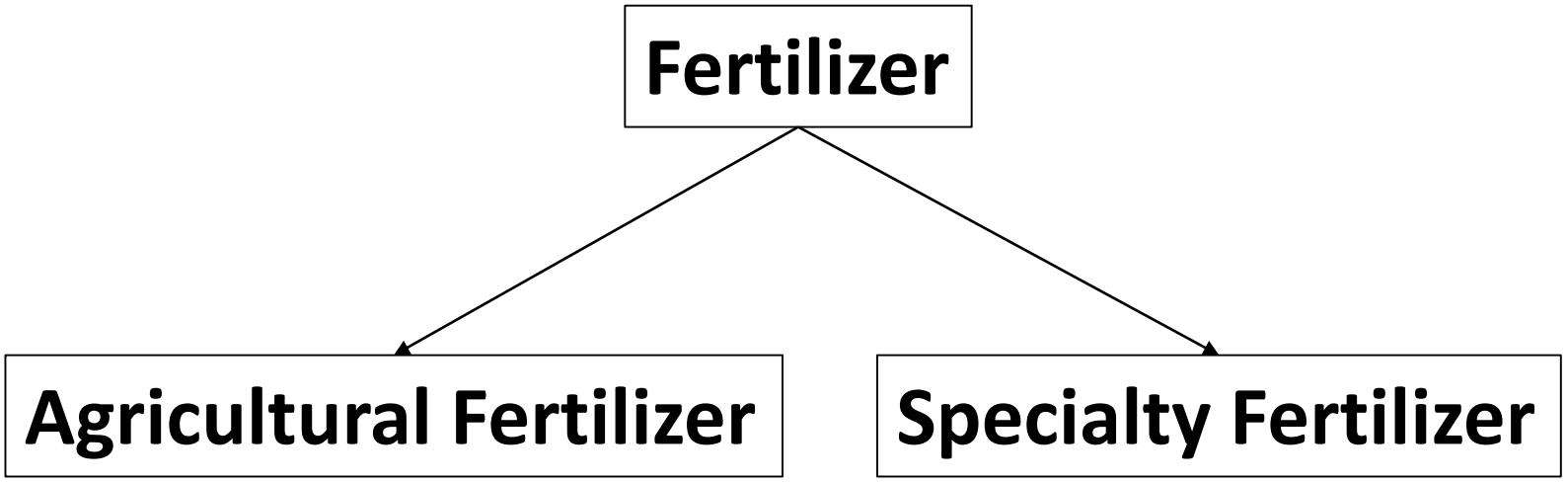
Fertilizers



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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.

Photo courtesy of USDA NRCS.

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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

Photo courtesy of MD Dept of Ag.

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Increase in Licenses Issued

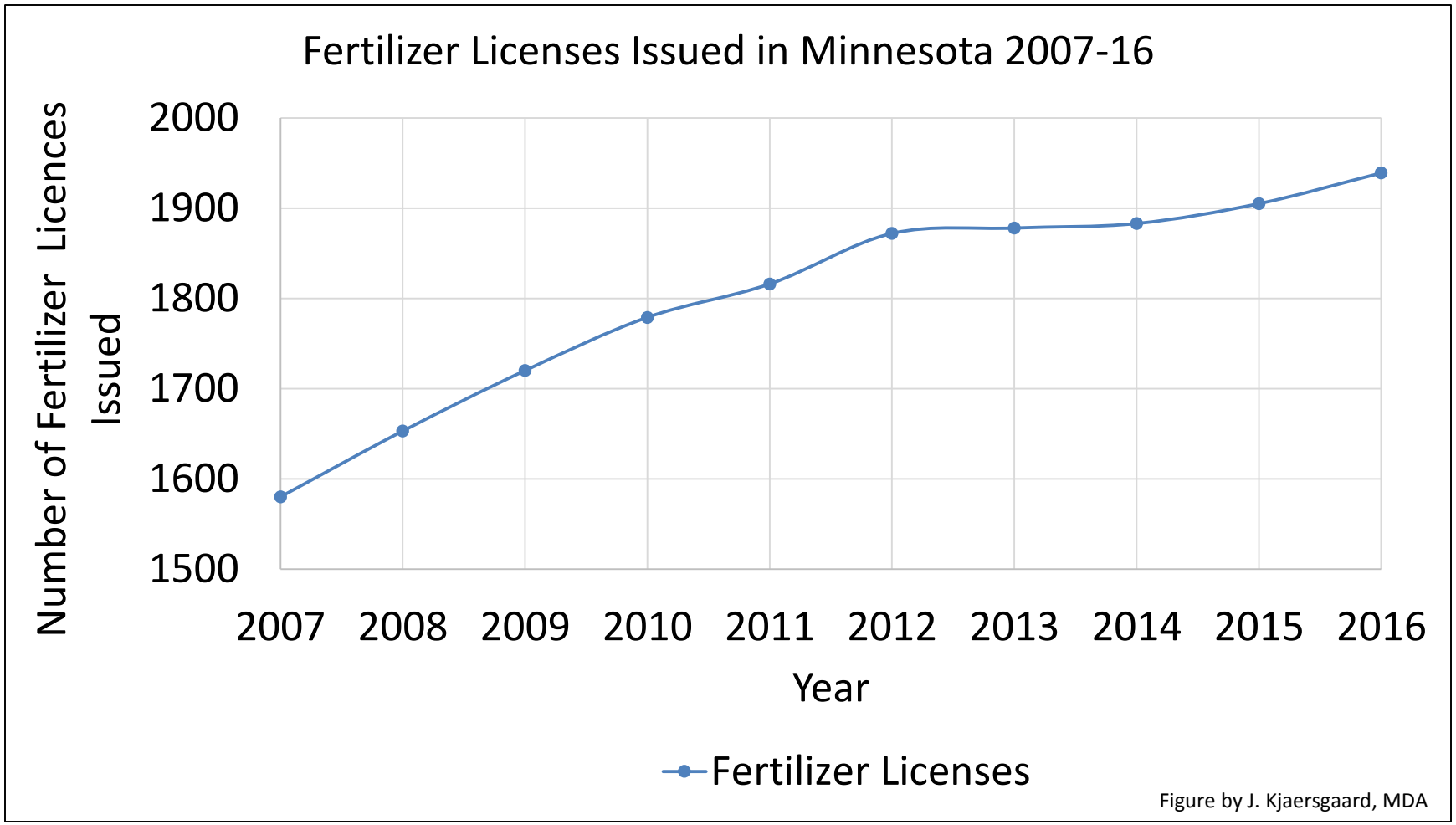

Figure by J. Kjaersgaard, MDA

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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

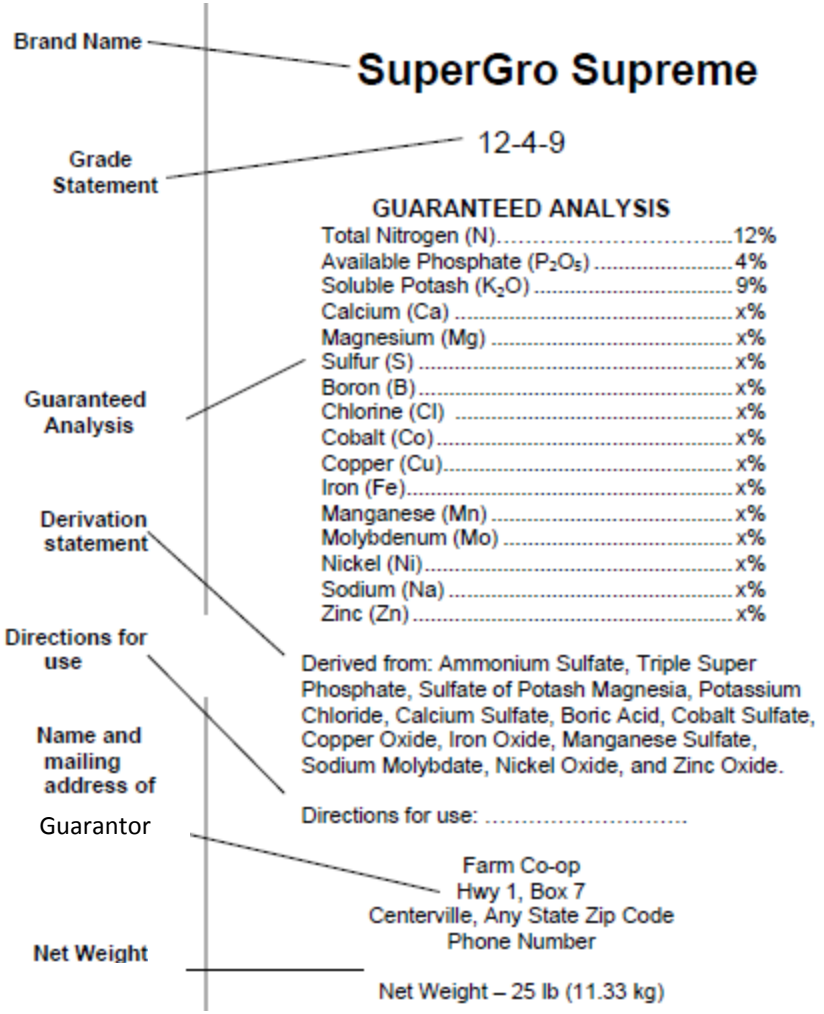

Figure Credit: AAPFCO

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Increase in Registrations Issued

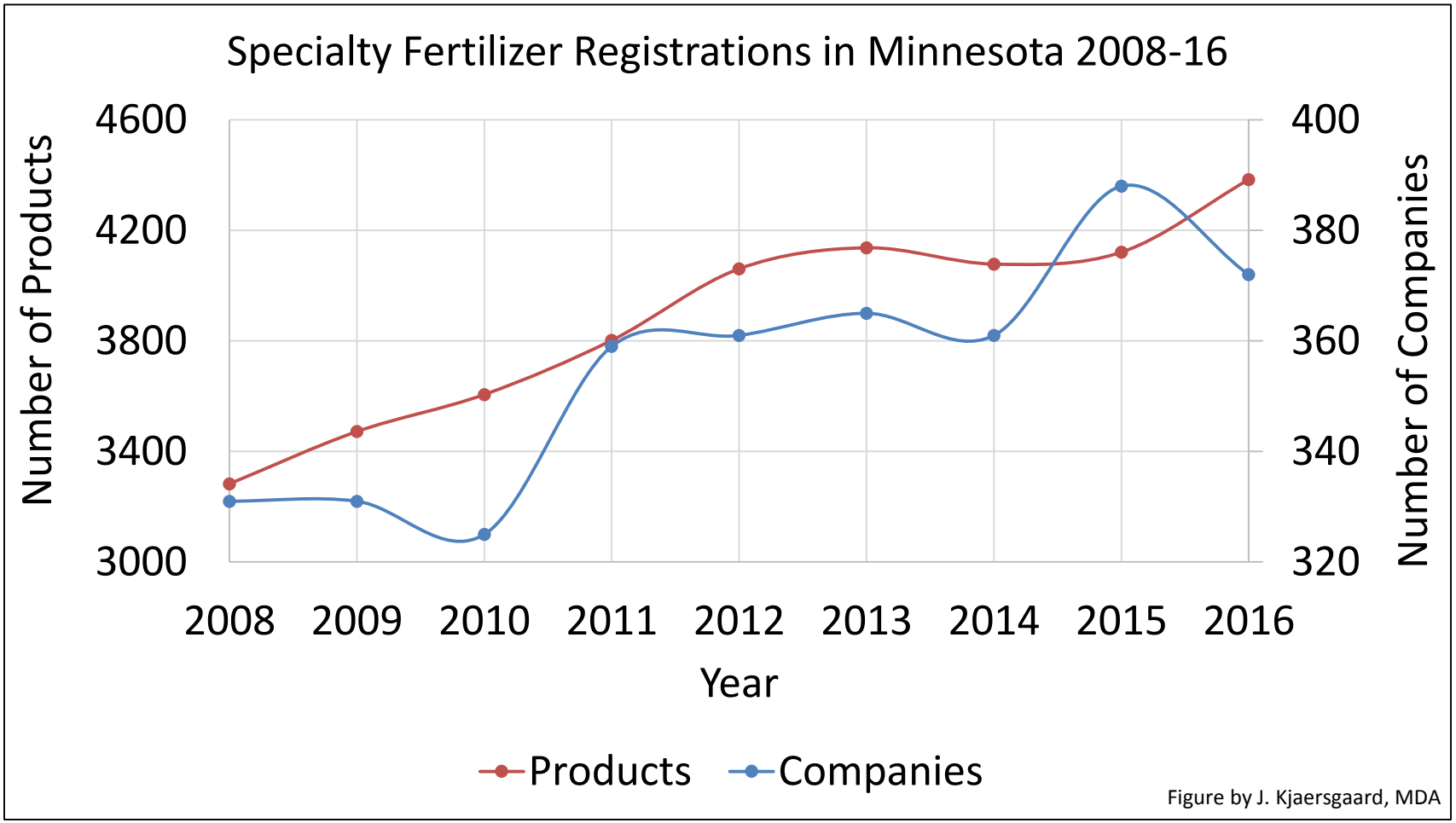

Figure by J. Kjaersgaard, MDA

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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

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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

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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 P2O5	10.0 x 2 = 20.0	9.8 x 2 = 19.6
Units of K2O	10.0 x 1 = 10.0	10.1 x 1 = 10.1
Sum	50.0	49.1

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

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Trends in Fertilizer Tonnage

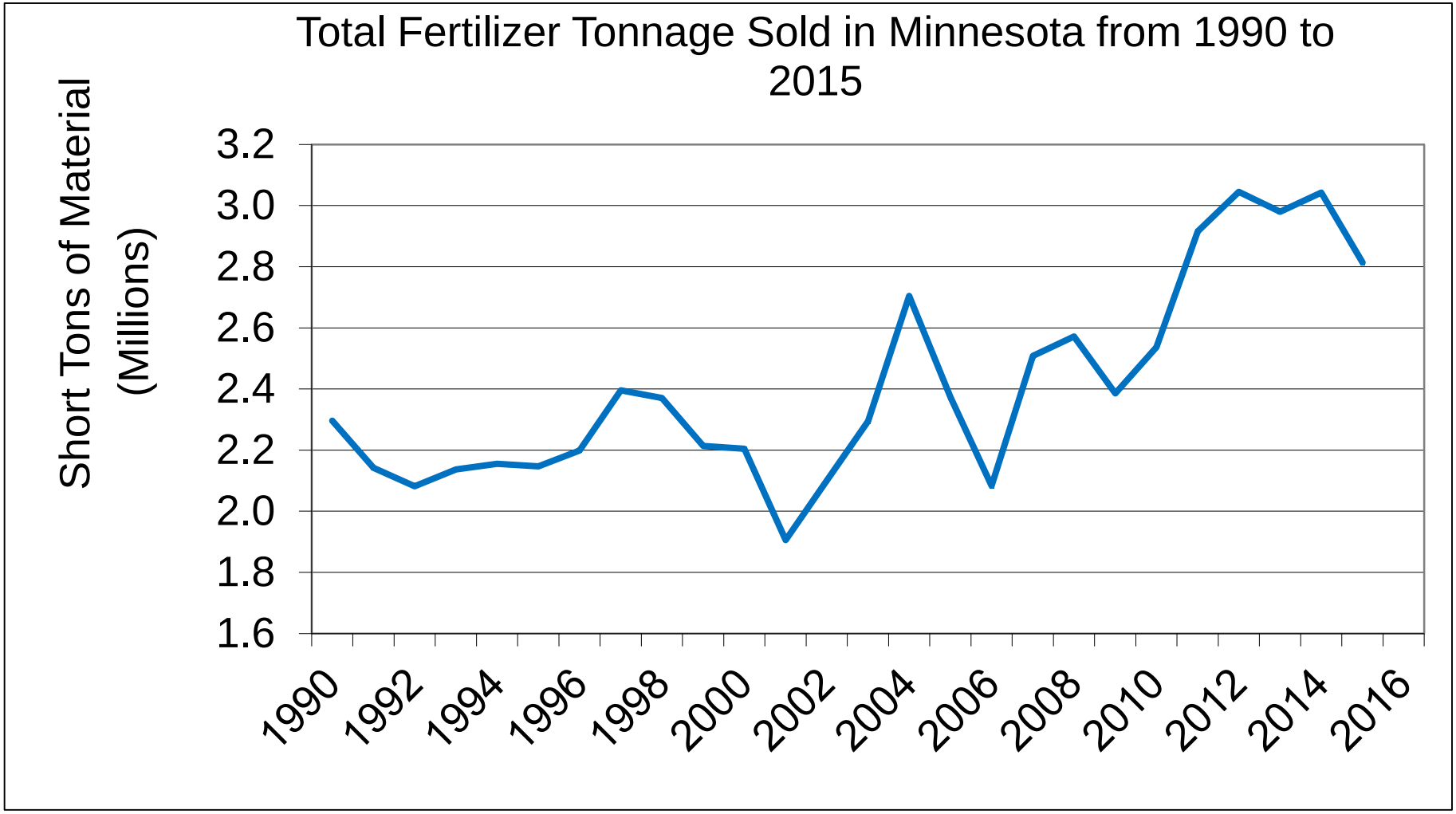

Figure redrawn from Bruce Montgomery and Tom Bolas, MDA

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Ag. Fertilizer and Specialty Fertilizer

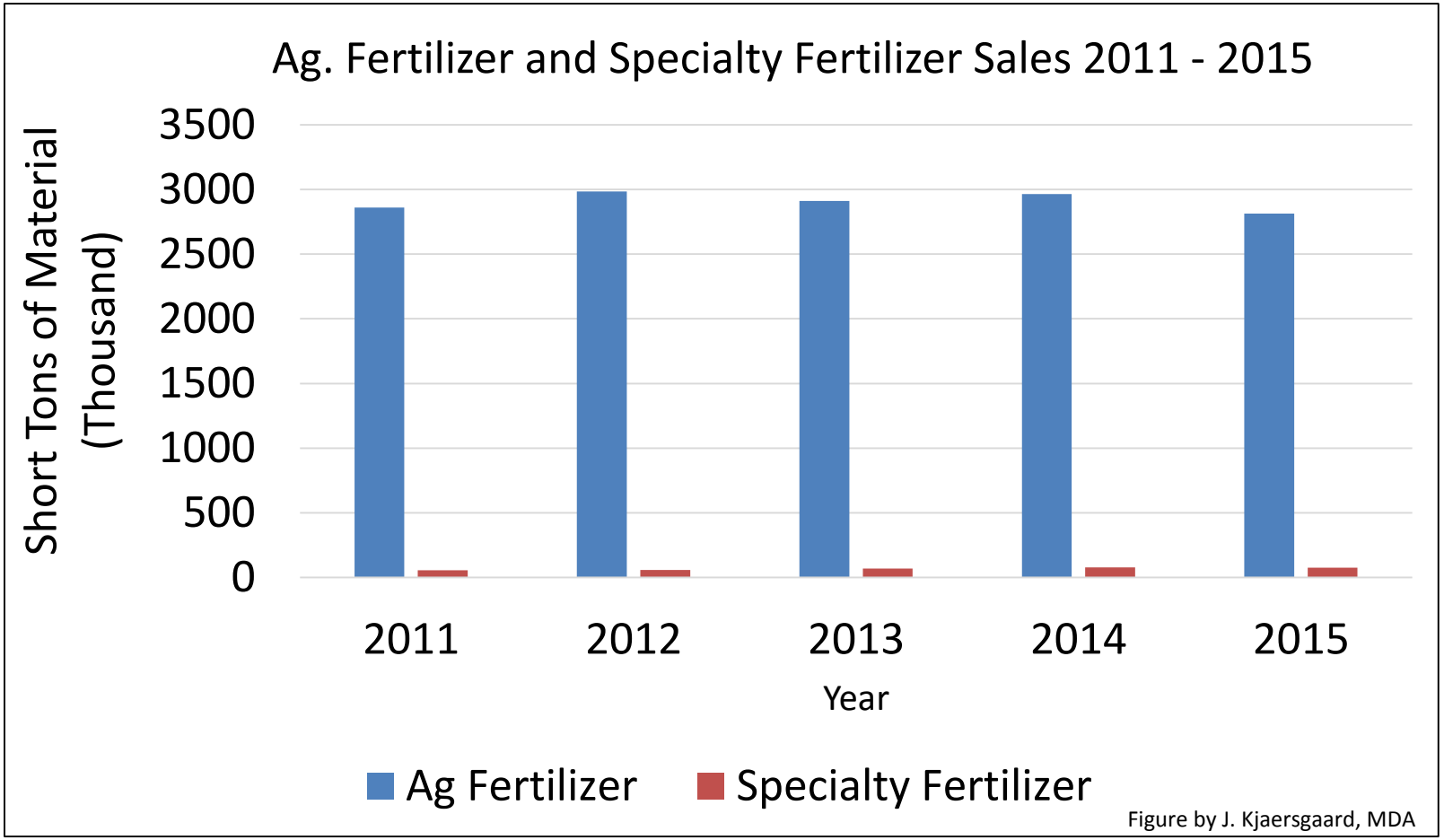

Figure by J. Kjaersgaard, MDA

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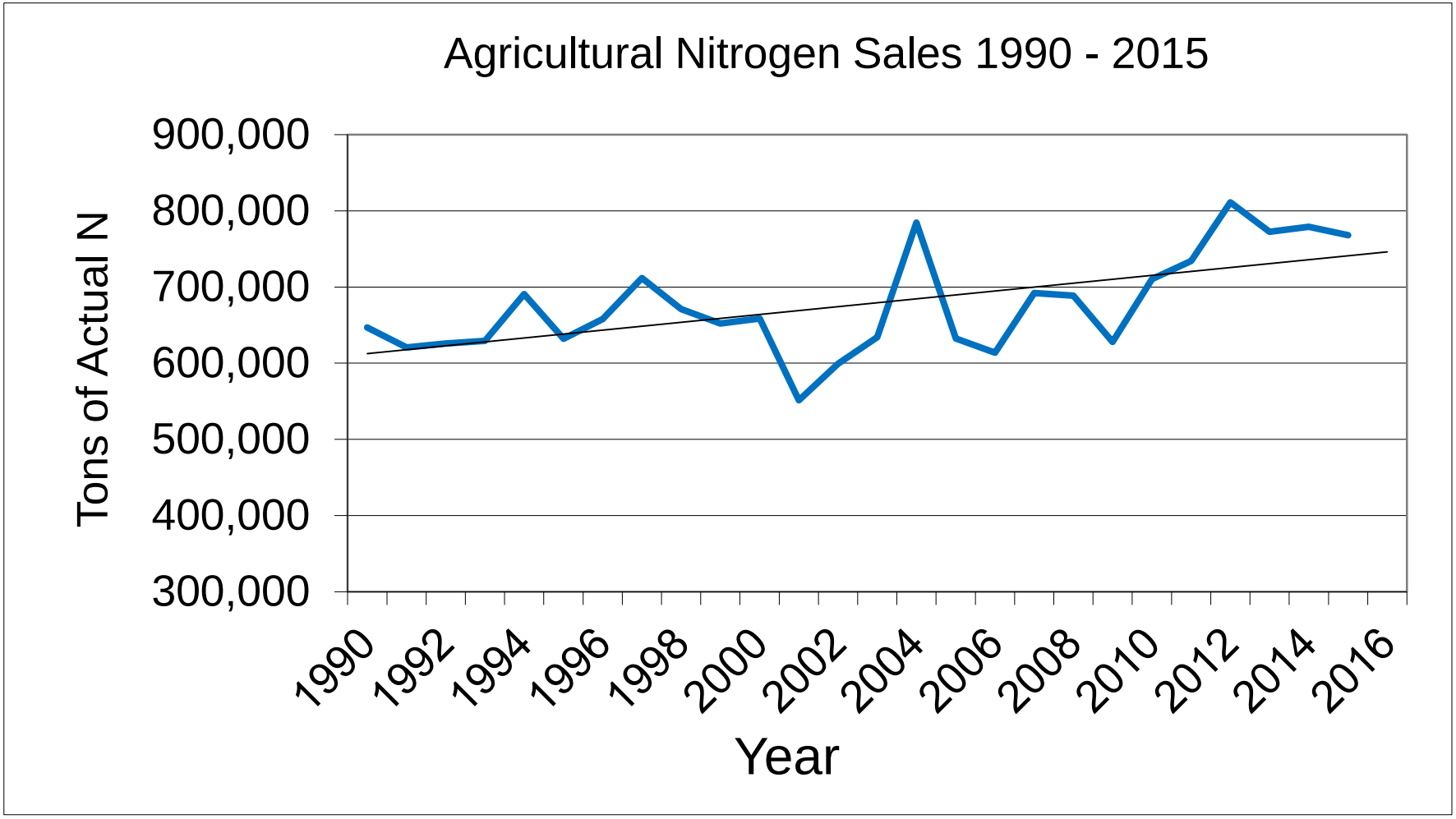
Trends in Nitrogen Fertilizer Sales



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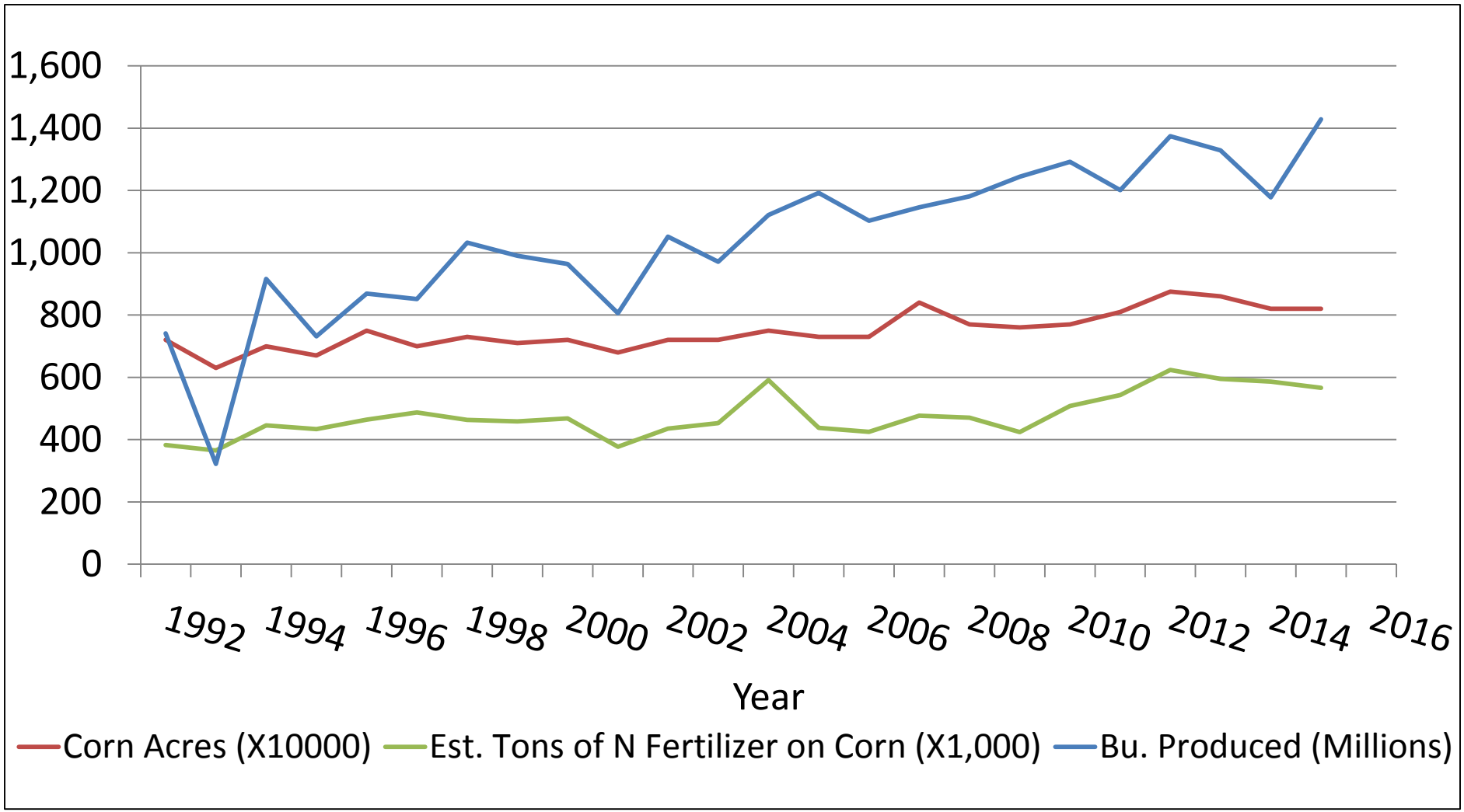
N Fertilizer Inputs and Production



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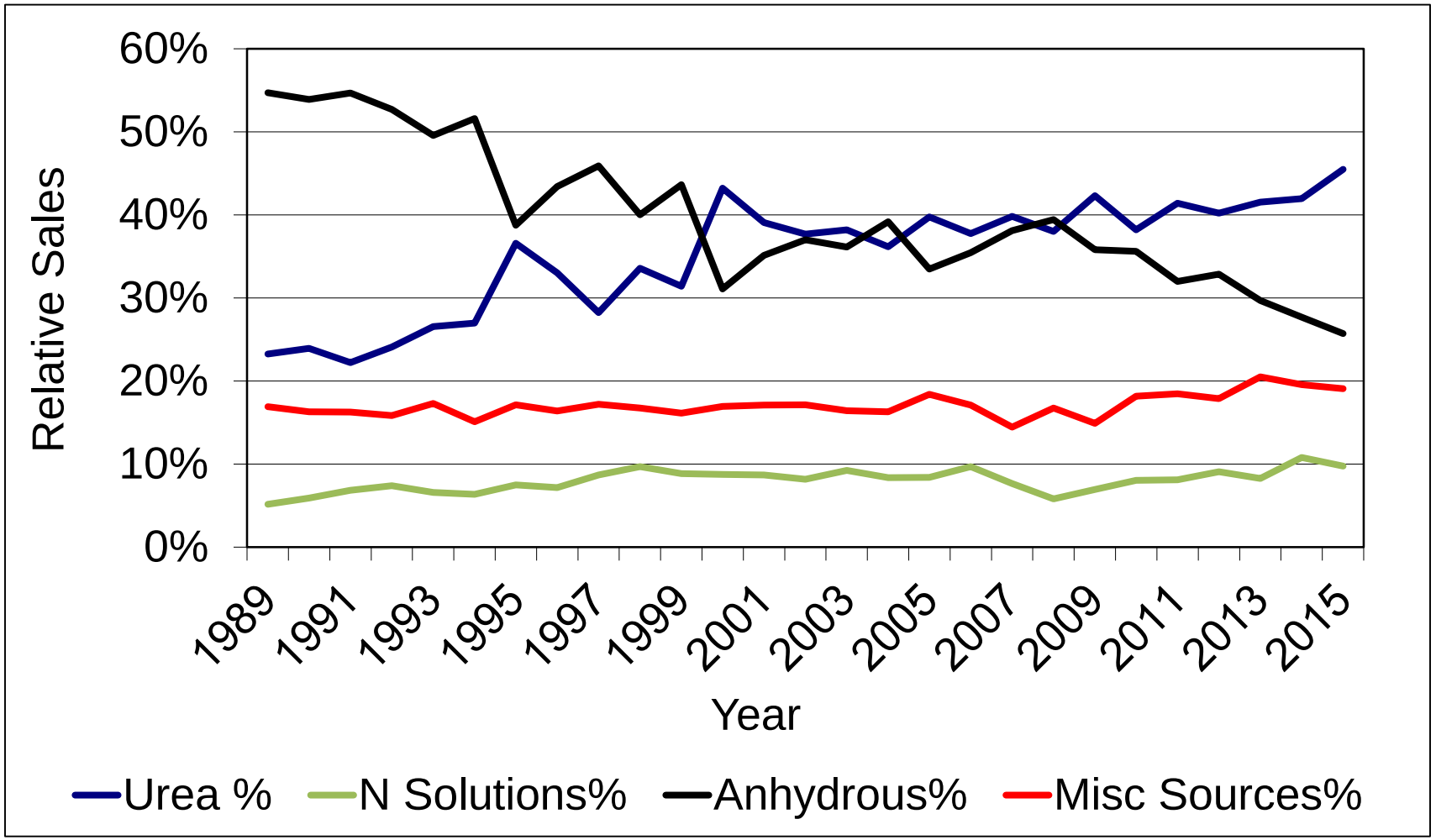
Distribution in Nitrogen Fertilizer



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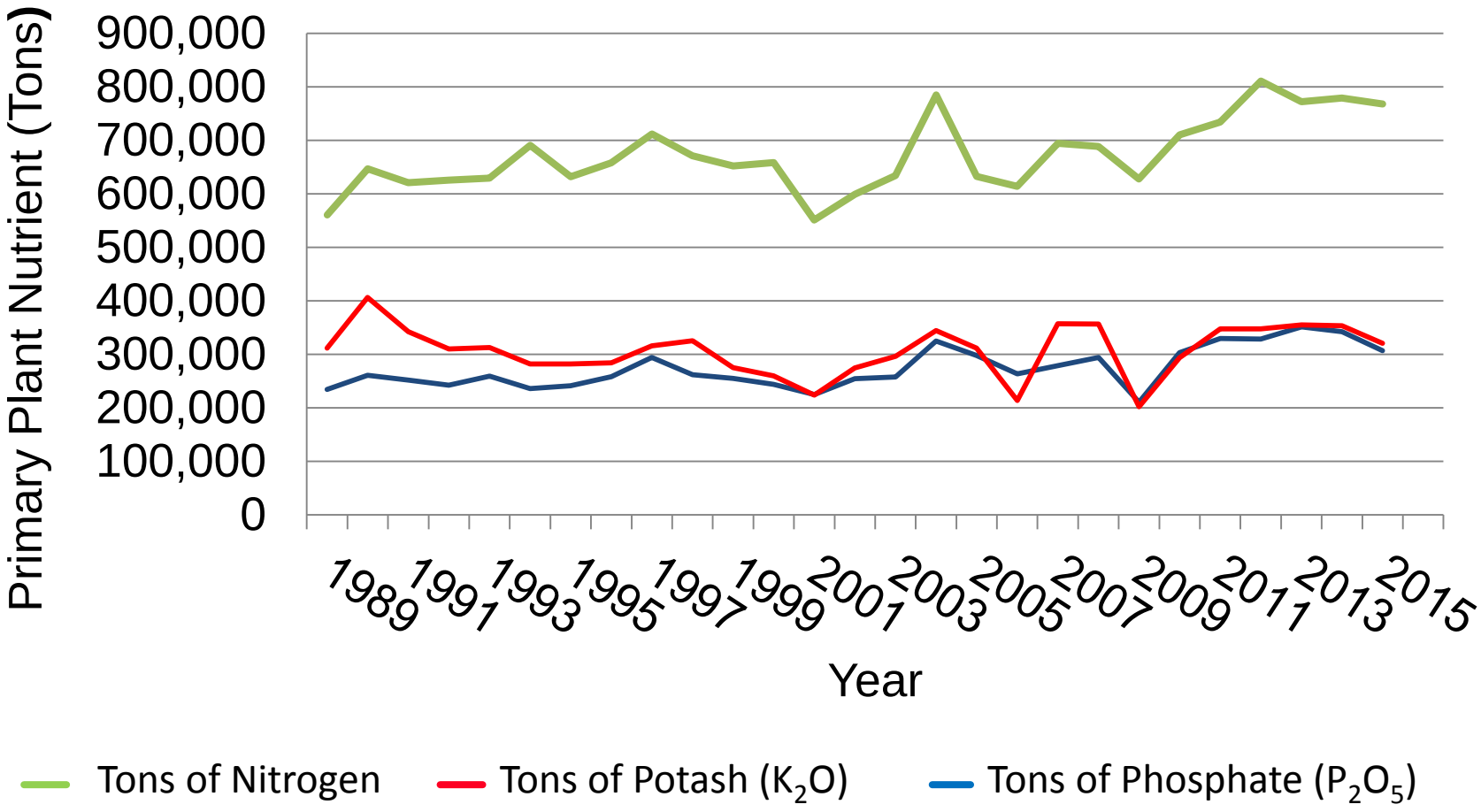
Trends in N, P and K



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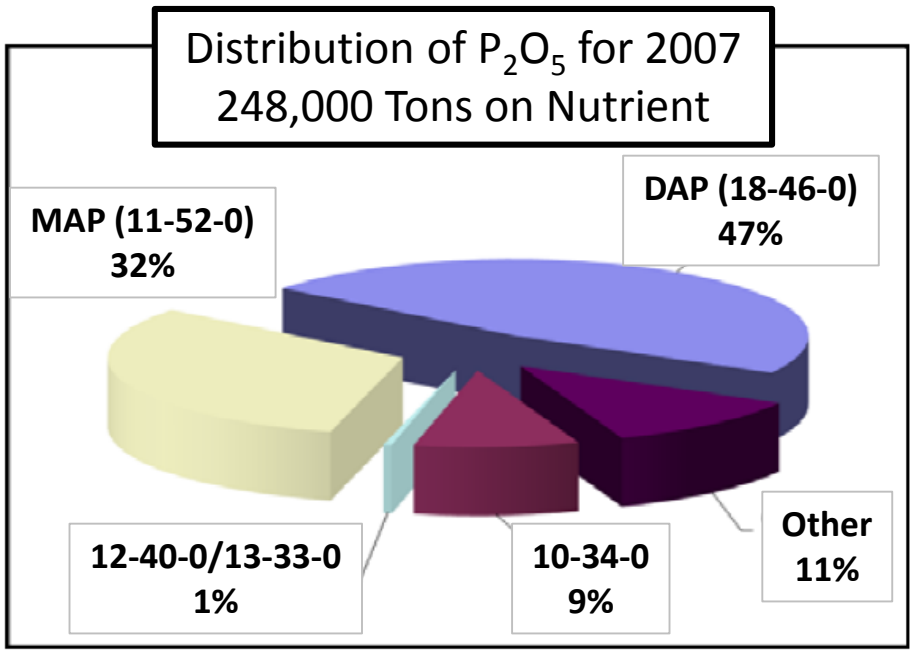
Distribution of Phosphate



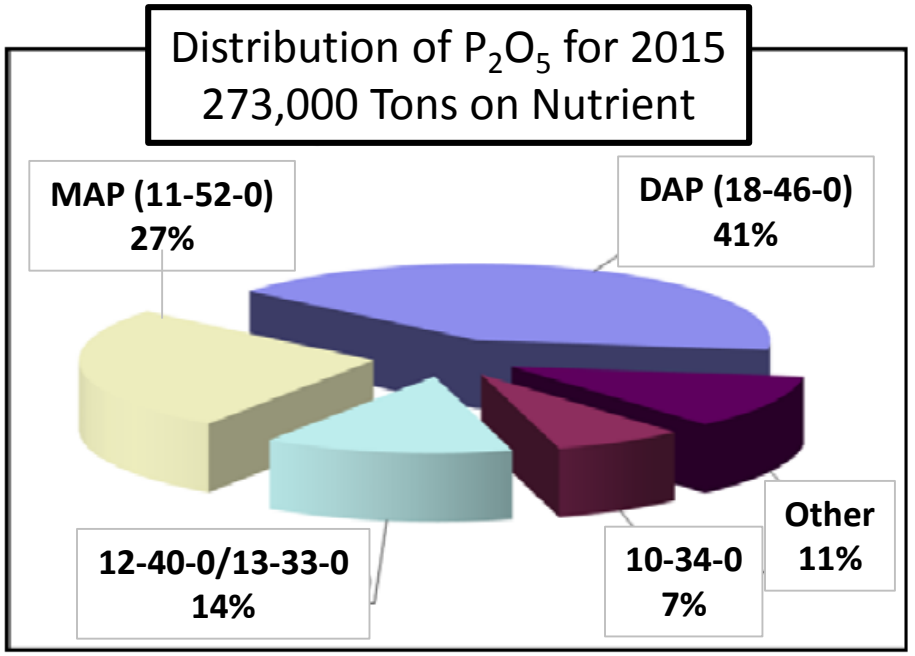


Figure by Tom Bolas, MDA

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SOIL AND PLANT AMENDMENTS

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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.

Photo courtesy of USDA NRCS.

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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.

Photo Credit: Seven Mile Creek Watershed Project

Registration Required

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

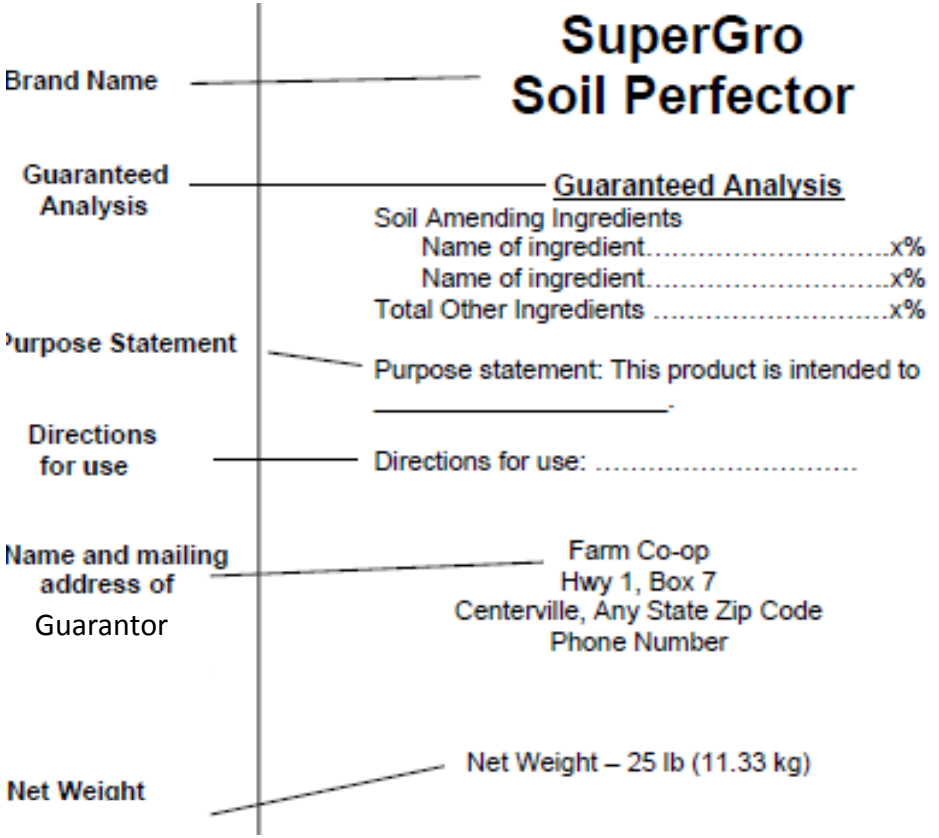

Figure Credit: AAPFCO

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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

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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

Photo courtesy of USDA NRCS.

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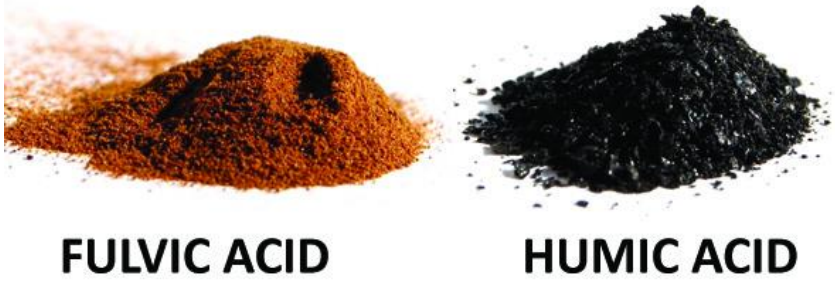
Amendments

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).



Graphic Credit: SAOSIS

Amendments

Wetting agents and flocculants

- Surfactants
- Polymers and gels
- Flocculants

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

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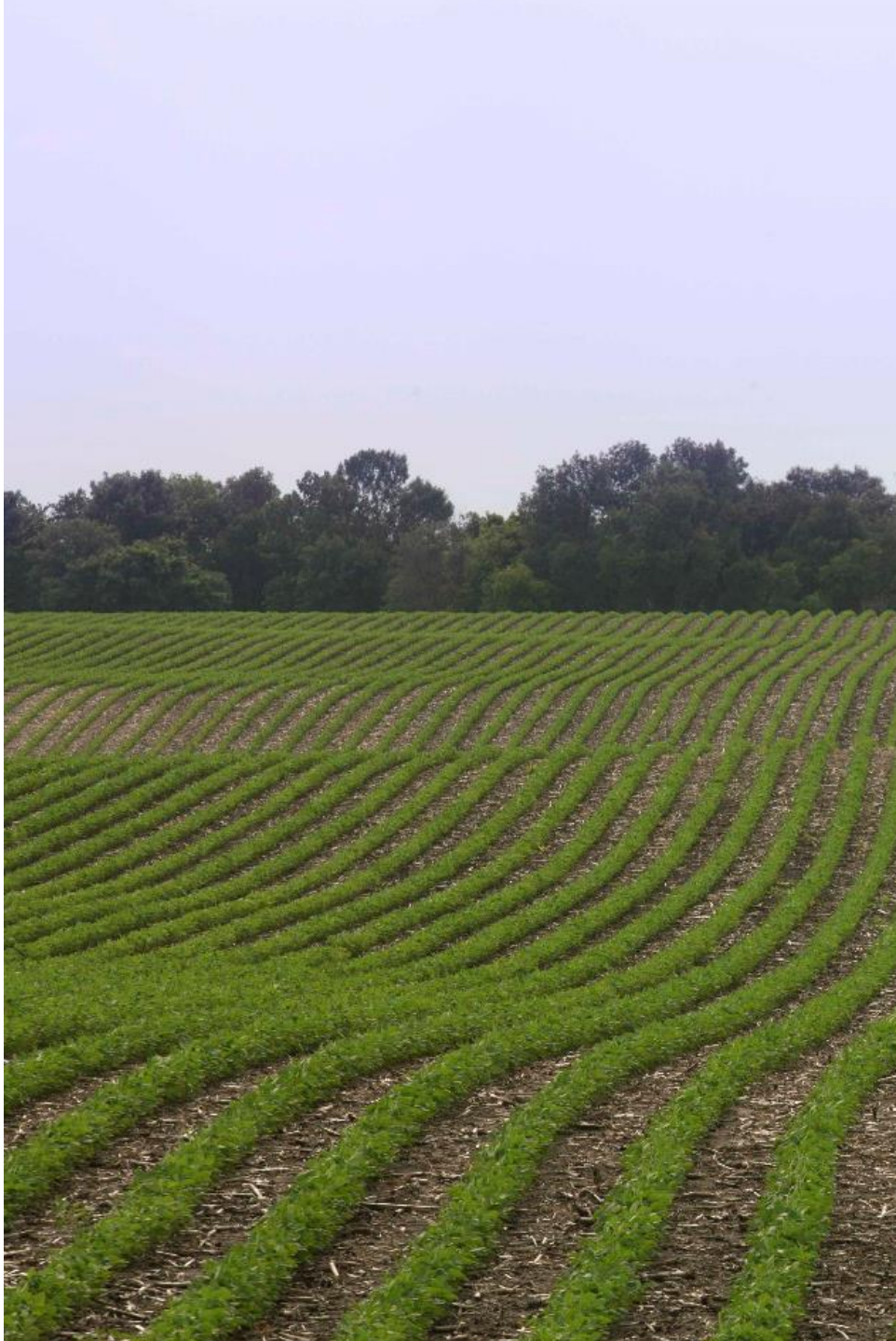
Amendments

Miscellaneous Enhancers

- Microbe food
- “Signaling” compounds
- Enzymes

- Purpose:
  - Enhance viability and vitality of microorganisms
  - Enhance crop’s nutritional capacity



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Amendments

Gypsum

- Common sources:
  - Mined
  - Flue-gas desulfurization
  - Recycle gypsum products

- Purpose:
  - Help improve soil structure
  - Reclaim high-sodium soil
  - Source of sulphate

Image courtesy Farm and Dairy

Amendments

Not soil/plant amendments

- Nitrogen stabilizers
  - Urease inhibitors
  - Nitrification inhibitors
- Maleic-Itaconic Copolymer

- Some active ingredients are considered pesticides, such as Nitrapyrin

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Increase in Registrations Issued

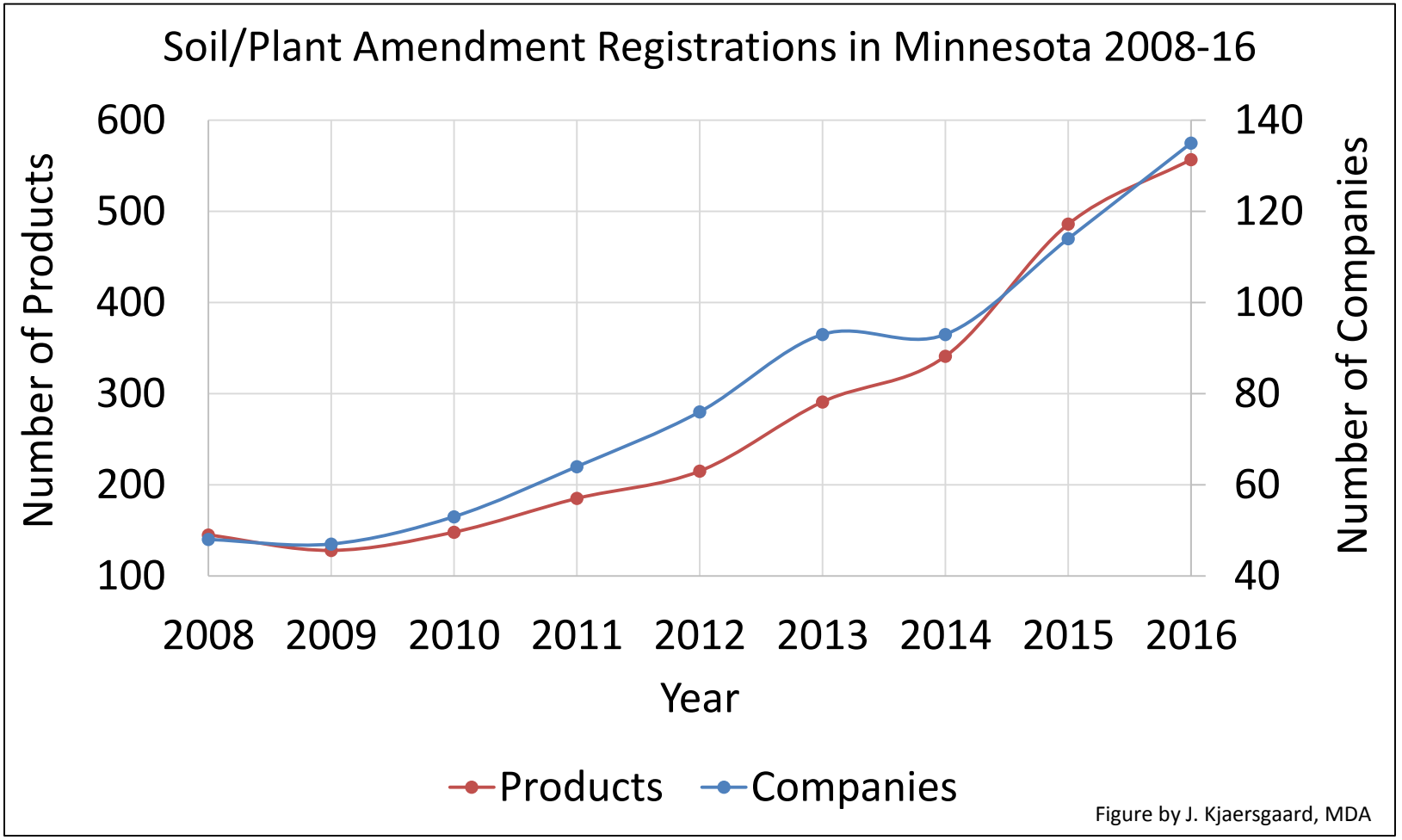


Figure by J. Kjaersgaard, MDA

Registrations by Product Category

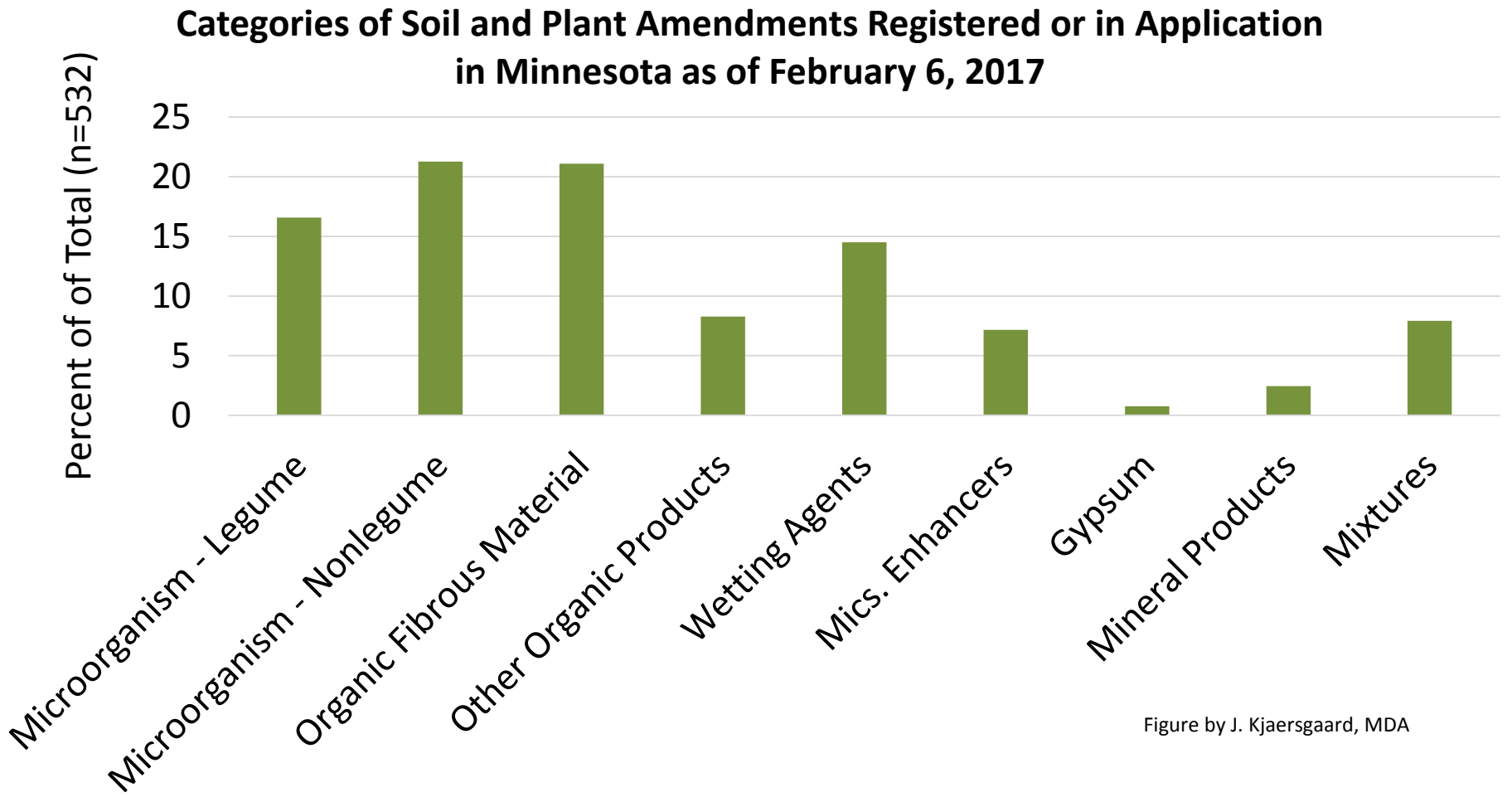
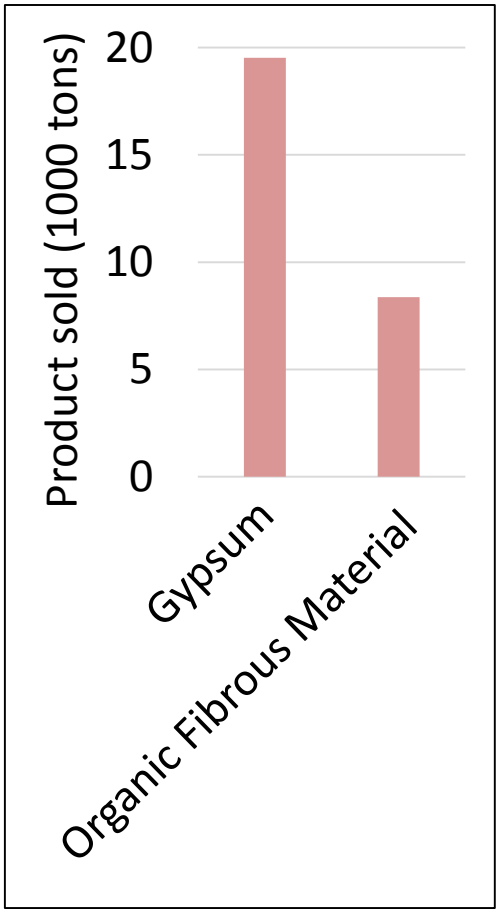


Figure by J. Kjaersgaard, MDA

Distribution by Product Category

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



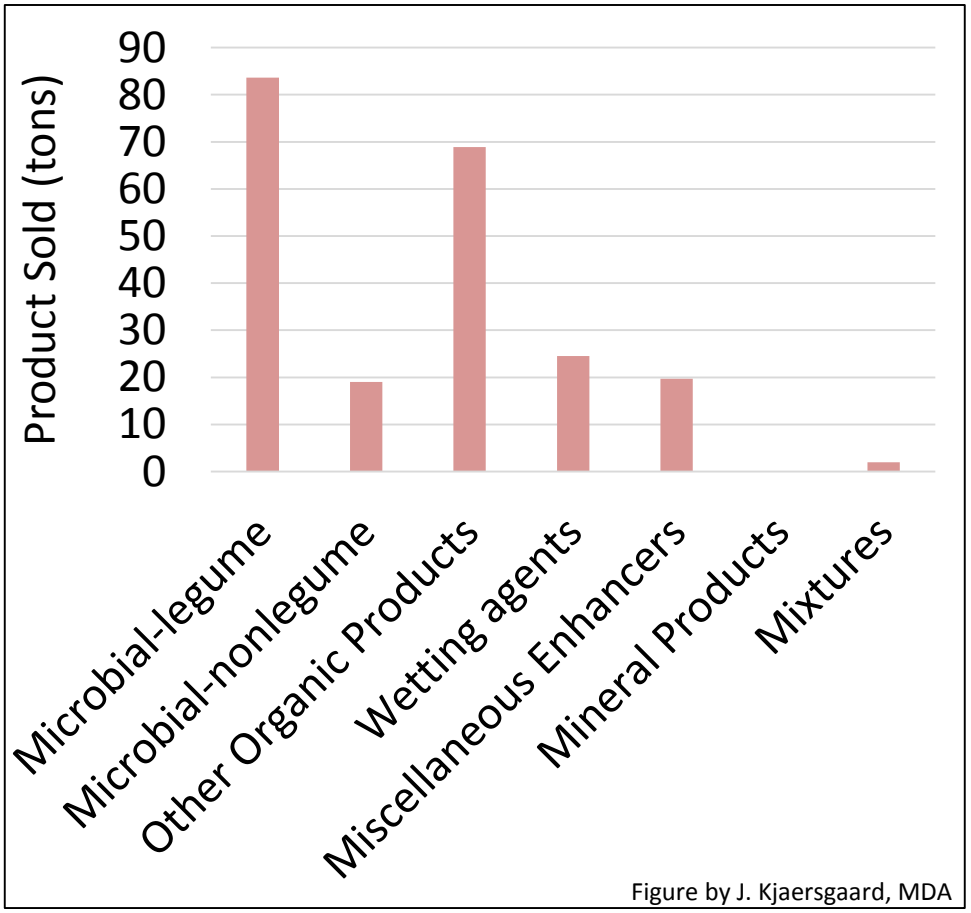


Figure by J. Kjaersgaard, MDA

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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

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Increase in Licenses/Registrations

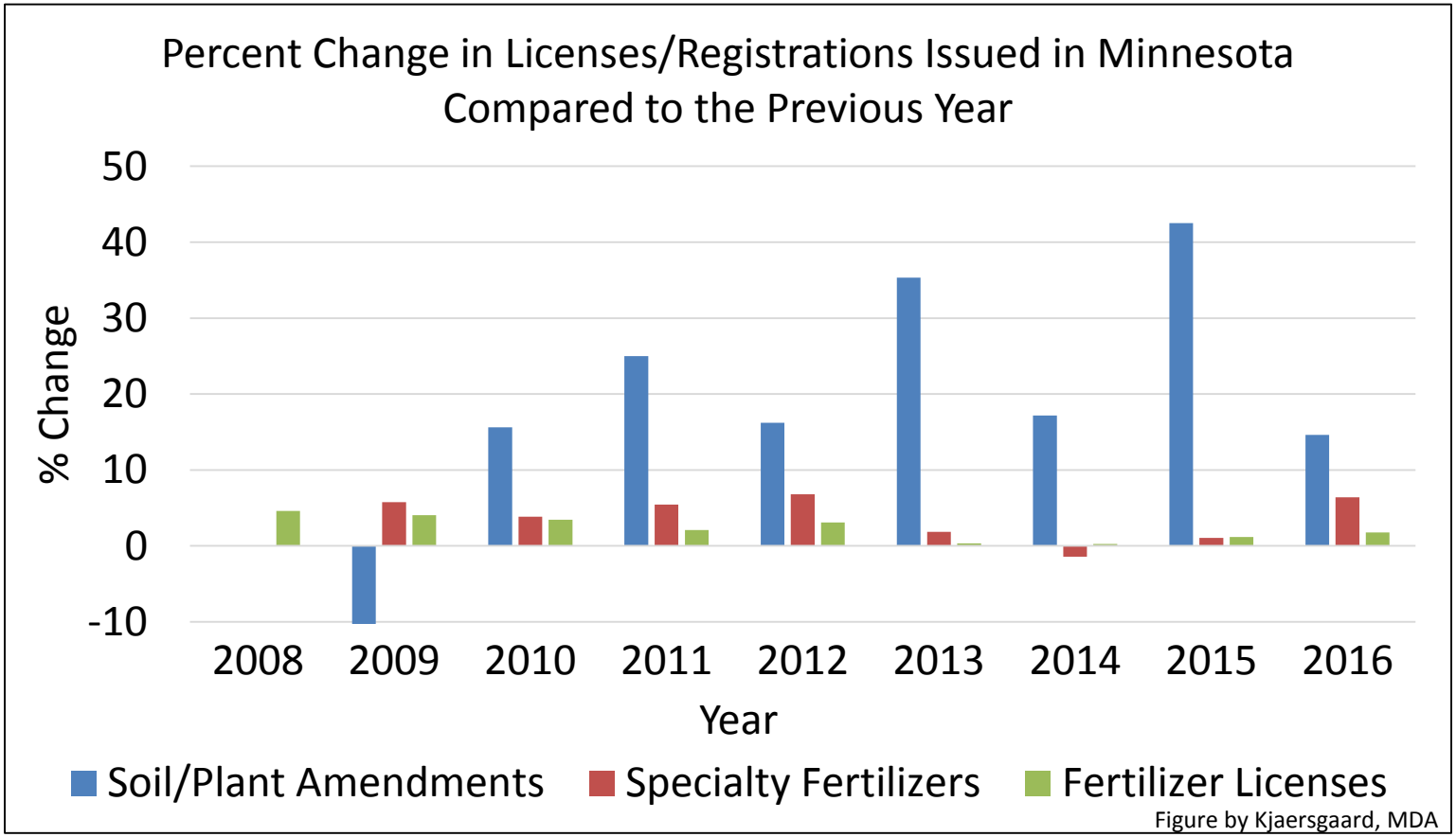

Figure by Kjaersgaard, MDA

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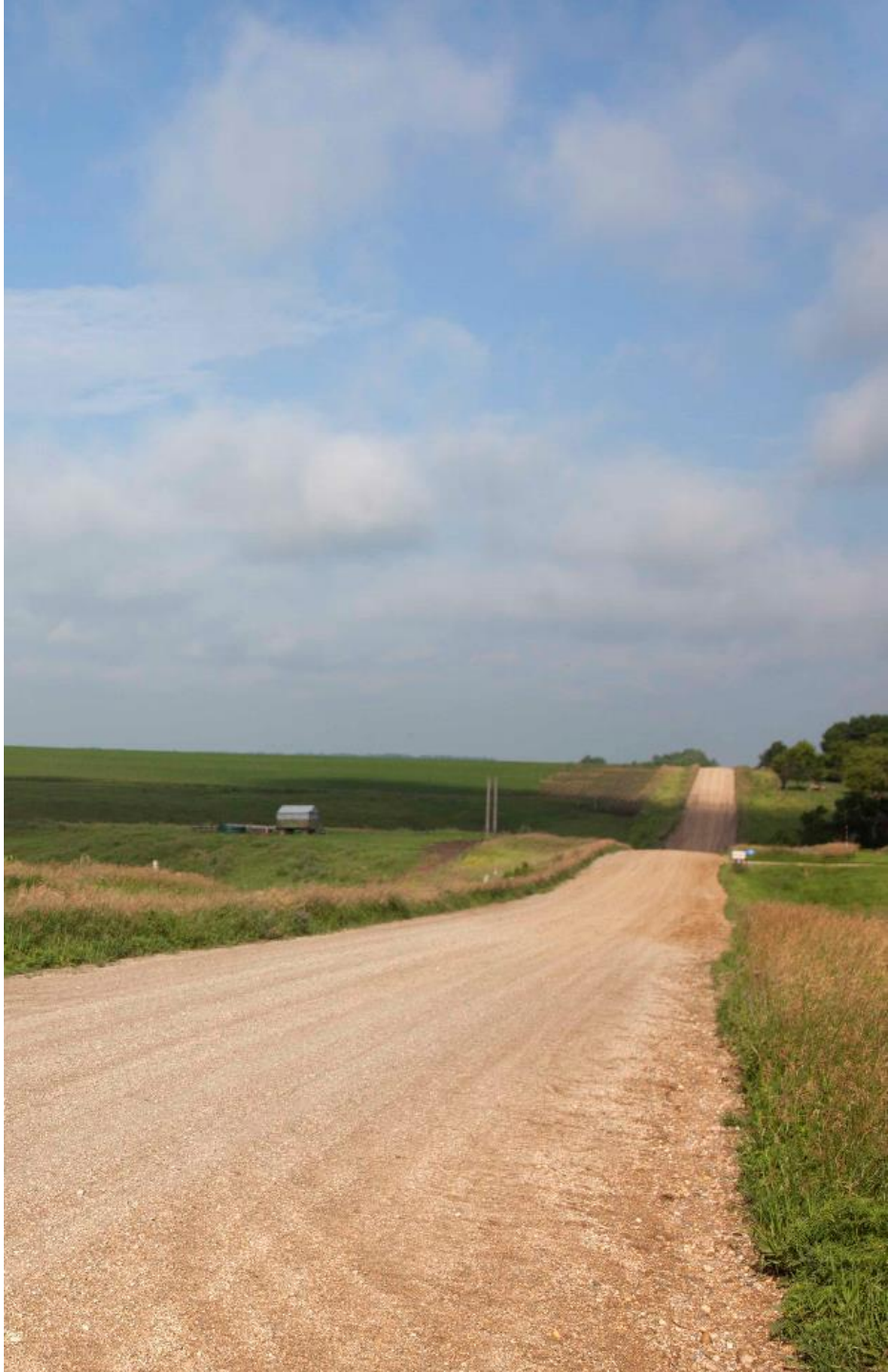
Tonnage Fee

- 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)



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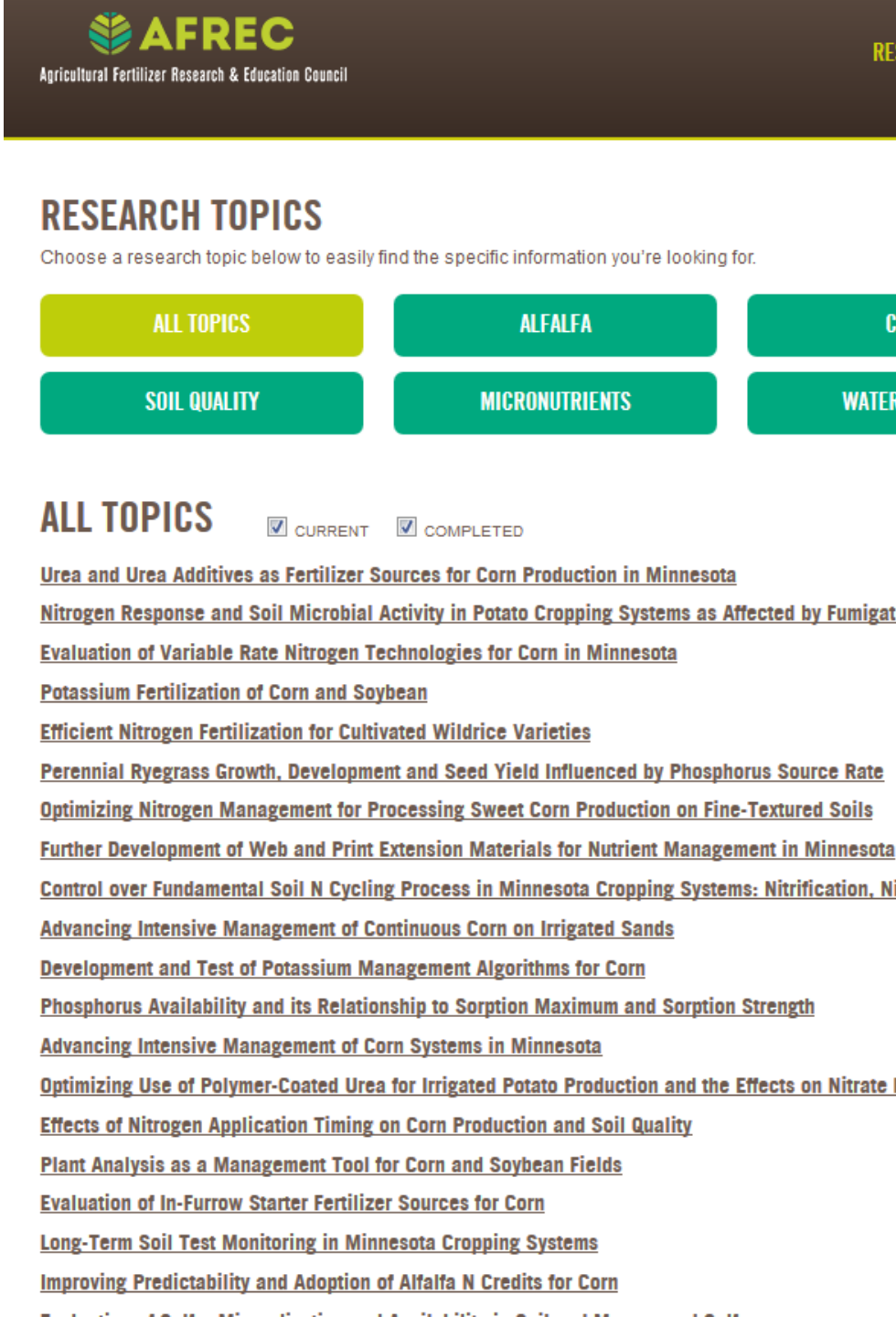
AFREC

Agricultural Fertilizer Research & Education Council

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



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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
Bacillus spp.	30,000 cfu/g	5,810,000 cfu/g
Glomus spp.	9 prop/g	16.4 prop/g
Bacillus spp.	170,000 cfu/g	11,300,000 cfu/g
Glomus spp.	5 prop/g	66 prop/g
Bacillus		0 cfu/ml
Bacillus		00 cfu/g
Pseudo		00 cfu/g
Trichod		00 cfu/g
Glomus		2 prop/g
Glomus spp.	15 prop/g	63 prop/g
Glomus spp.	556 prop/ml	953 prop/ml
Bacillus spp.	47,000 cfu/ml	35,010,000 cfu/ml
Bacillus spp.	53,000 cfu/ml	35,010,000 cfu/ml

Oregon Department of Agriculture's 2015 analysis:
The microorganism counts of 22 out of 27 products tested was lower than the label guarantee

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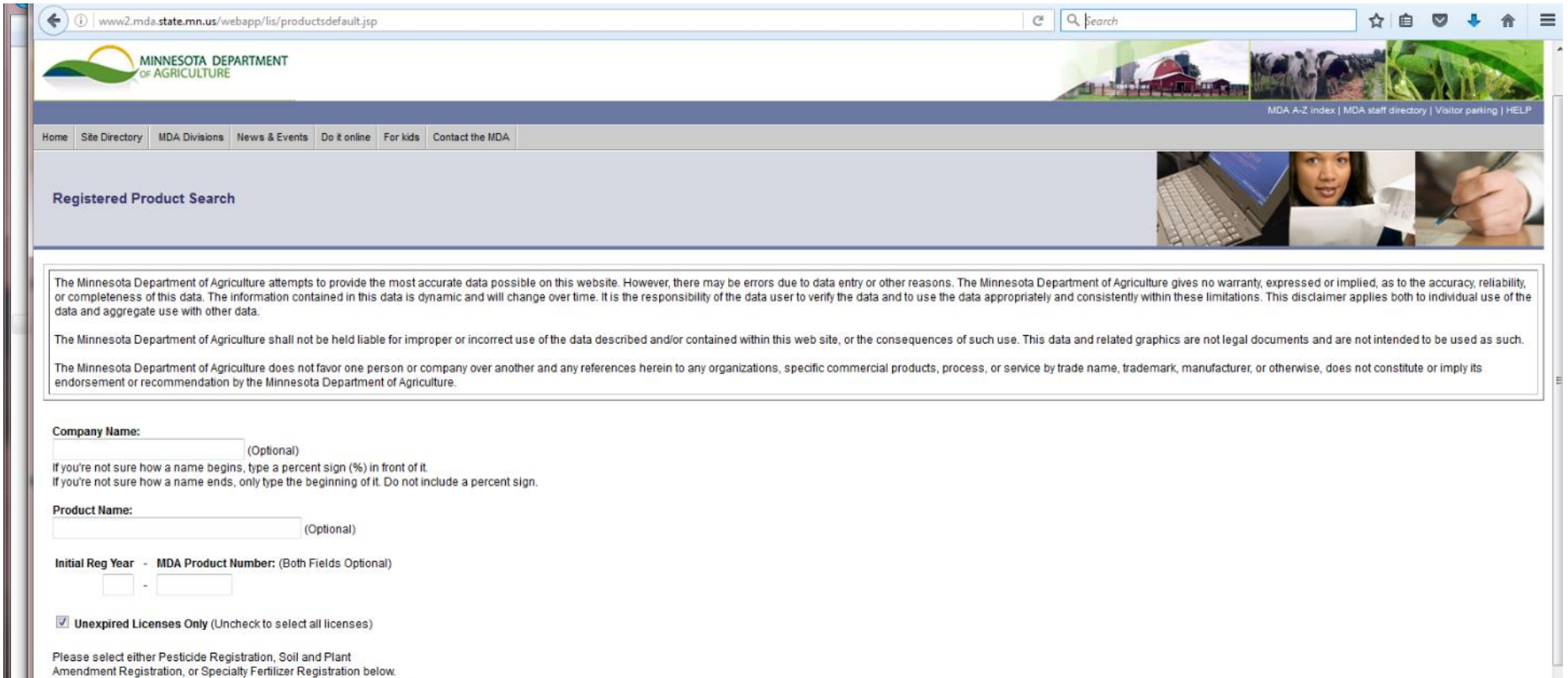
Product Efficacy

- 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



Carol Durden

Program Administrator

carol.durden@state.mn.us

605-201-6379

Jeppe Kjaersgaard

Research Scientist

jeppe.kjaersgaard@state.mn.us

605-201-6149