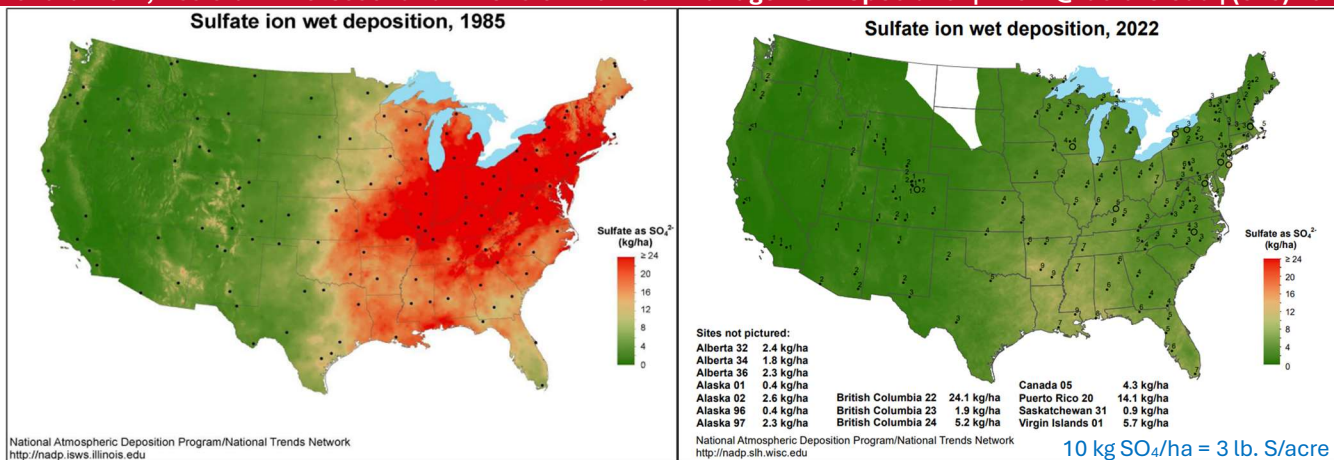


Sulfur for Corn and Soybean Production

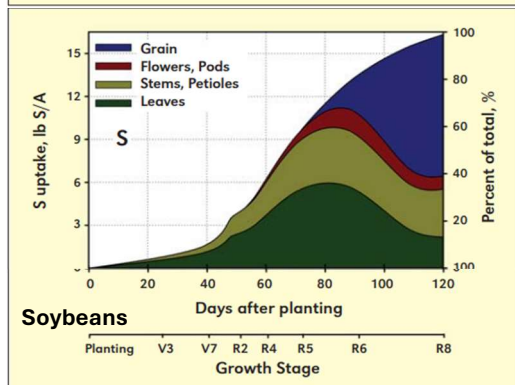
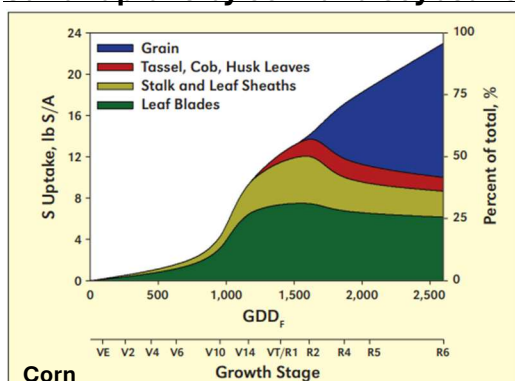
Dr. Richard Roth, Assistant Professor and Extension Nutrient Management Specialist | rroth@iastate.edu | (515) 294-0506



Role of sulfur in corn and soybeans

- Building proteins to regulate metabolic pathways
- Chlorophyll synthesis
- Nitrogen metabolism

Sulfur uptake by corn and soybeans



Sulfur deficiency symptoms

- Pale green to yellow leaves, stunted plants, can result in corn striping
- Deficiency is most likely during cool, wet conditions or sandy soils with low SOM
- Early season deficiency may disappear

Tools to indicate S deficiency

- General field/soil characteristics
- Visual coloration and growth response
- Replicated strip trails +/- S for multiple years
- Plant tissue testing

Sulfur tissue test critical levels

Crop	Sample Stage	Adequate		Deficient	
		%S	N:S	%S	N:S
Corn*	Ear leaf at silking	>0.20	<12:1	<0.18	>16:1
Soybeans	Upper most full eaves at early flower	>0.25	<15:1	<0.25	>18:1
Alfalfa	Top 6 inches at early bloom	>0.25	NA	<0.25	NA

*Don't confuse with Mg, Mn, Zn deficiency

Current Iowa sulfur recommendations

Corn/Soybean or Corn/Corn

- 15 lb S/acre fine-textured soils
- 25 lb S/acre on course-textured soils
- Apply every other year

Alfalfa

- Topdress 20-30 lb S/acre

Does sulfur fertilizer decrease soil pH?

- Only elemental S will decrease pH but requires excessively high application rates that are not economically feasible
- Sulfate-based S fertilizers do not affect pH

Do we need to worry about sulfate leaching?

- Sulfur will leach but not as readily as nitrogen
- In water-logged soils, sulfate can be converted to sulfide, which is temporarily unavailable but also will not leach

How much S do we get from organic matter?

- 2-3 lb S/acre/year

Availability of S fertilizer sources

- Sulfate-based sources are immediately plant-available
 - Ex: gypsum, AMS
- Thiosulfate is half elemental and half sulfate, so a portion must be oxidized before available but it happens very fast
- Elemental must be oxidized by microbes before plant available, little to no advantage fall vs. spring