

## How Drought Affects Nutrients

When growers face sub-optimal crop yields due to drought, a common question is how much fertilizer will be required for the next growing season.

### Consider crop removal:

Crop and Component	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
	----- lb/bu -----		
Corn Grain	1	0.35	0.25
Corn Stover	0.5	0.25	1.05
Soybeans Grain	4.2	0.9	1.5
Soybeans Stover	1.3	0.3	0.9

Less grain and stover removal means less nutrient removal.

### Nutrients removed at various corn yields:

Yield BPA	Corn ----- lb removed/acre -----		
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
25	25	9	6
50	50	18	13
75	75	26	19
100	100	35	25
125	125	44	31
150	150	53	38
175	175	61	44
200	200	70	50

### Nutrients removed at various soybean yields:

Yield BPA	Soybeans ----- lb removed/acre -----	
	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
5	5	8
10	9	15
15	14	23
20	18	30
30	27	45
40	36	60
50	45	75
60	54	90

### Soil sampling in a very dry fall:



- **Concern:** Clay minerals shrink - hold K ions
- **Result:** Inaccurately low K soil test results
- **Action:** Wait for adequate soil moisture before sampling

### Nitrogen (N) remaining in corn fields:

- Poor plant uptake of N due to dry weather
- Nitrogen in nitrate form in the soil
- Lack of moisture has prevented leaching or denitrification
- Environmental loss of N has been minimal

### Trap crops:

- Wheat and cereal rye are best crops to prevent nitrogen loss
- Nitrogen will not be available to the subsequent crop due to immobilization of N in the residue
- When growing wheat for harvest, fall N can be eliminated while spring N may be reduced
- Using trap crops improves organic matter and soil tilth, while improving water quality

### Conclusions:

- Applying maintenance rates or no fertilizer may be acceptable depending on yield and previous soil test results
- Avoid soil sampling until moisture levels return to normal
- Wheat may be a good crop to take advantage of leftover nitrogen. Watch for head scab when planting wheat after corn.