CROPFOCUS

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_2O_5	K_2O
	- - - - - - - 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:

	Corn - - - - - - - - - - lb removed/acre - - - - - - - - - -		
Yield BPA	N	P_2O_5	K_2O
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:

	Soybeans - - - - - - - - - lb removed/acre - - - - - - - -	
Yield BPA	P_2O_5	K_2O
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.