New Tri-State Fertilizer Recommendations:

Sunrise Precision Solutions

With an update to the Tri-State Nutrient Recommendations being released by Fall of 2020 there will be some big differences to the presentation of numbers from soil tests results. Sunrise Cooperative will take the opportunity to change from reporting soil tests from pounds/acre to parts per million (ppm).

The new Tri-State will be reporting in Mehlich-3 extraction instead of the Bray-1 for Phosphorus and Ammonium Acetate (AA) for K, Mg, and Ca. This follows the labs in the Midwest as they have been using Mehlich-3 for years but converting to Bray and AA since the original Tri-States reported in these extractions.

A difference in the calculations is the elimination of Drawdown Applications. This will make zero application rates for P at 40 ppm and K at 130 ppm for CEC<6 and 170 ppm for CEC>6.

Another calculation difference is with K recommendations. Original Tri-States calculated Critical Value (CV) based on CEC for all levels. New Tri-States have a CV based on CEC of 6, which is the turning point between course and fine soils, according to the authors. If CEC is below 6, then the CV is 100 ppm while a CEC greater than CEC 6 will be 120 ppm. CEC is still in the calculation for build-up but not for establishing CV.

AgStudio will run a conversion of our soil test database from lbs/acre to ppm and from Bray-1/AA to Mehlich-3 to prevent confusion when looking at older tests.

The conversions are as follows:

PHOSPHORUS

Bray-P ⟷ Mehlich-3 P

multiply by 1.35 →

← *divide by 1.35*

POTASSIUM

AA-K ⟷ Mehlich-3 K

multiply by 1.14 →

← *divide by 1.14*

LBS/ACRE TO PPM CONVERSION

PPM × 2 = **lbs/acre**

lbs/acre ÷ 2 = **PPM**

Source: Ohio State University
ohioline.osu.edu/factsheet/anr-75

For more information visit:
https://agcrops.osu.edu/Fertility Resources/tri-state_info

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The actual difference in application rates is small, with exception of crop removal for K which is reduced by 25%. The K recommendation reduction is not noticeable if utilizing yield data for fertility recommendations, higher yielding areas will get more applied. Below are examples of 2 samples to show differences:

Starting Value	Multiply By	Desired Value
Ammonium Acetate-K	1.14	Mehlich-3 K
Ammonium Acetate-Ca	1.15	Mehlich-3 Ca
Ammonium Acetate-Mg	1.24	Mehlich-3 Mg

Source: Ohio State University
ohioline.osu.edu/factsheet/anr-74

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	Grain Nutrient Removal Rates			Total Grain Nutrient Removed at Harvest		
	Corn	Soybean	Wheat	Corn (180 bu)	Soybean (60 bu)	Wheat (80 bu)
	(lb of nutrient/bushel grain)			(lbs of nutrient/acre)		
N	0.74	3.55	0.96	134	213	77
P_2O_5	0.35	0.79	0.49	62	47	39
K_2O	0.20	1.14	0.24	36	68	19
Ca	0.06	0.22	0.08	11	13	6
Mg	0.05	0.14	0.07	9	8	6
S	0.05	0.18	0.07	9	11	6
B	0.0003	0.0023	0.0003	0.05	0.14	0.03
Cu	0.0001	0.0008	0.0003	0.02	0.05	0.02
Fe	0.0013	0.0054	0.0025	0.24	0.32	0.20
Mn	0.0002	0.0017	0.022	0.04	0.10	0.18
Zn	0.0010	0.0023	0.0015	0.17	0.14	0.12
Na	0.0003	0.0008	0.0003	0.06	0.05	0.03

Contact your Sunrise Precision Solutions Specialist for more details.