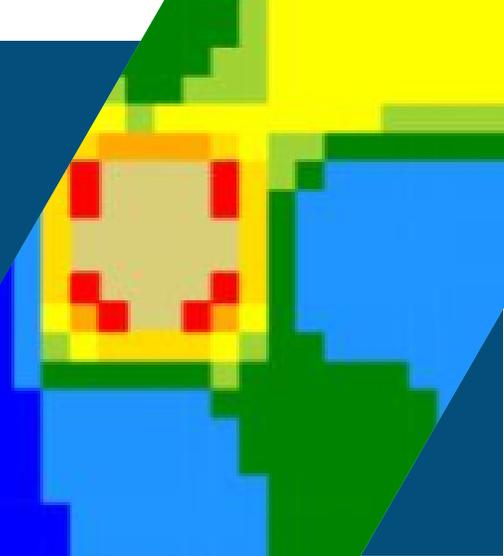


2020 TRI STATE FERTILIZER RECOMMENDATIONS

Equations used for Calculating New Fertilizer Recommendations & Comparing Bray to Mehlich Soil Tests.



EXAMPLE A BUILD UP

Yield Goals:
180 bushel corn
60 bushel beans
No Starter
Soil Test P: 15
Soil Test K: 110
CEC: 10.5

Build up range: (Yield x Nutrient removal) + [(Critical Level - Soil Test P) x 5]

$$\begin{aligned} &(180 \times 0.35) + [(20-15) \times 5] \\ &63 + (5 \times 5) \\ &63 + 25 \\ &= 88 \text{ P2O5} \\ 88 / .52 &= \sim 169 \# \text{ MAP for Corn} \\ &(60 \times 0.8) + [(20-15) \times 5] \\ &48 + (5 \times 5) \\ &48 + 25 \\ &= 73 \text{ P2O5} \\ 73 / .52 &= \sim 140 \# \text{ MAP for Beans} \end{aligned}$$

If you had a starter credit that total P2O5 would be subtracted here

Total 11-52-0 for this soil test point: 309 lbs

Build up range: [(Yield x Nutrient removal) + 20] + [(Critical Level - Soil Test K) x (1 + (0.05 x CEC))]

$$\begin{aligned} &[(180 \times 0.2) + 20] + [(120-110) \times (1 + (0.05 \times 10.5))] \\ &(36 + 20) + [10 \times (1 + 0.525)] \\ &56 + (10 \times 1.525) \\ &56 + 15.25 \\ &= \sim 71 \text{ K2O} \\ 71 / .60 &= \sim 119 \# \text{ Potash for Corn} \\ &[(60 \times 1.15) + 20] + [(120-110) \times (1 + (0.05 \times 10.5))] \\ &(69 + 20) + [10 \times (1 + 0.525)] \\ &89 + (10 \times 1.525) \\ &89 + 15.25 \\ &= \sim 104 \text{ K2O} \\ 104 / .60 &= \sim 174 \# \text{ Potash for Beans} \end{aligned}$$

If you had a starter credit that total K2O would be subtracted here

Total 0-0-60 for this soil test point: 293 lbs

EXAMPLE B MAINTENANCE

Yield Goals:
180 bushel corn
60 bushel beans
Starter: 5 gl 10-34-0 (~ 4lb P2O5/gl = 20 # P2O5)
Soil Test P: 29
Soil Test K: 153
CEC: 11.2

Yield x Nutrient Removal

$$\begin{aligned} &(180 \times 0.35) \\ &63 \text{ P2O5} \\ &- 20 \text{ P2O5 for starter credit} \\ &= 43 \text{ P2O5} \\ 43 / .52 &= 83 \# \text{ MAP for Corn} \\ &(60 \times 0.8) \\ &= 48 \text{ P2O5} \\ 48 / .52 &= 92 \# \text{ MAP for Beans} \end{aligned}$$

Total 11-52-0 for this soil test point: 175 lbs

[(Yield x Nutrient Removal) + 20]

$$\begin{aligned} &[(180 \times 0.20) + 20] \\ &36 + 20 \\ &= 56 \text{ K2O} \\ 56 / .60 &= \sim 93 \# \text{ Potash for Corn} \\ &[(60 \times 1.15) + 20] \\ &69 + 20 \\ &= 89 \text{ K2O} \\ 89 / .60 &= \sim 148 \# \text{ Potash for Beans} \end{aligned}$$

Total 0-0-60 for this soil test point: 241 lbs

Mehlich III results versus Bray P1/ AAK

Bray P1 lbs to Mehlich III ppm
 $Bray \text{ P1 lbs} \times 1.35 = Mehlich \text{ P lbs} / 2 = Mehlich \text{ III ppm}$
Example:
 $30 \text{ Bray P1} \times 1.35 (\text{Bray} > \text{Mehlich III}) = 41 \text{ P M3 lbs}$
 $41 / 2 (\text{lbs} > \text{ppm}) = 20 \text{ P ppm}$

AAK lbs to Mehlich III ppm
 $AAK \text{ lbs} \times 1.14 = Mehlich \text{ K lbs} / 2 = Mehlich \text{ III ppm}$
Example:
 $175 \text{ AAK} \times 1.14 (\text{AAK} > \text{Mehlich III}) = 200 \text{ K M3 lbs}$
 $200 / 2 (\text{lbs} > \text{ppm}) = 100 \text{ K ppm}$

NUTRIENTS REMOVED

IN HARVESTED GRAIN

If you would like more information on the new 2020
Tri-State fertilizer recommendations:



Crop	lb P2O5 / unit	lb K2O / unit
Corn	0.35 / bushel	0.20 / bushel
Soybean	0.80 / bushel	1.15 / bushel
Wheat	0.50 / bushel	0.25 / bushel
Wheat Straw	3.7 / ton	29 / ton
Alfalfa	12.0 / ton	49 / ton
Corn Silage	3.1 / ton	7.3 / ton

RECOMMENDED MEHLICH-3 SOIL TEST

PHOSPHORUS & POTASSIUM LEVELS

Crop	Mehlich-3 Phosphorus Maintenance Range	Mehlich-3 Potassium Maintenance Range	
		Sandy Soils (CEC < 5meq / 100g)	Loam & Clay Soils (CEC > 5meq/ 100g)
Corn (grain or forage), Soybean	20-40 ppm	100-130 ppm	120-170 ppm
Wheat, Alfalfa	30-50 ppm	100-130 ppm	120-170 ppm

EQUATIONS

USED FOR CALCULATING NEW FERTILIZER RECOMMENDATIONS

Phosphorus (lb P2O5 / acre to apply)

Maintenance Range	$\text{Yield} \times \text{Nutrient Removal}$
Build - Up Range	$(\text{Yield} \times \text{Nutrient Removal}) + [(\text{Critical Level} - \text{Soil Test P}) \times 5]$

Potassium for Indiana & Ohio (lb K2O / acre to apply)

Maintenance Range (Grain Crops)	$(\text{Yield} \times \text{Nutrient Removal}) + 20$
Build - Up Range	$[(\text{Yield} \times \text{Nutrient Removal}) + 20] + [(\text{Critical Level} - \text{Soil Test K}) \times (1 + (0.05 \times \text{CEC}))]$
Maintenance Range (Forage Crops)	$[(\text{Yield} \times \text{Nutrient Removal}) + 20] - [(\text{Yield} \times \text{Nutrient Removal}) + 20] \times (\text{Soil Test K} - \text{Critical Level}) / 50]$