

SOIL FERTILITY CALCULATION FOR PEANUT

TEST = MEHLICH 1

SHEET 1

TEST LAB	Waters		TEST DATE	10/14/16			DATE	11/2/16		CUSTOMER NAME			
FIELD	DP4E 1-20						CROP	PEANUT		EXAMPLE		Peanut Farmer	
Base Ca	Base Mg	Base K	Ca	Mg	K	P Lb/A	S Lb/A	B Lb/A	Zn Lb/A	Mn Lb/A	Fe Lb/A	Cu Lb/A	
58.20%	9.12%	3.27%	Calculated From Base Sat.			75.05	20.0	0.80	9.6	33.8	25.0	5.00	
Gypsum	Hi Cal	Dolomite	Ca	Mg	K	P	S	B	Zn	Mn	Fe	Cu	
1,200		615	(89.4)	(17.4)	(13.5)	21.0	(177.2)	0.40	(1.2)	(7.4)	(1.0)	(4.0)	
CEC	pH	CEC x ^a	INSURE CALCIUM IS ADEQUATE ADJUST pH to 6.8				Phosphorus Override		Potassium Override		111		
6.4	6.6	1.2					Ca %	Mg %	K %	Nitrogen Override		(10.00)	
POTATO	SMALL GR	PEANUT	Production Nutrient Requirements in Lbs/Ac Per Year						LCD		25.0		
NUTRIENTS	N	P ₂ O ₅	K ₂ O	Ca	Mg	S	B	Zn	Mn	Fe	Cu		
SOIL BASE NEEDS	40	48	(16)	(89)	(17)	(177)	0.40	(1.2)	(7.4)	(1.0)	(4.04)		
CROP REMOVAL	(10)	80	111	630	140	88	0.70	0.7	7.0	3.5	0.70		
TOTAL REQUIRED	30	64	95	541	123	(90)	1.10	(0.5)	(0.4)	2.5	(3.34)		
LB/AC	ANALYSIS	1	3	4	22	5	0.04				0.1		
	L - 19-0-0												
	L - 0-6-18												
	L 1 - 7-0-8												
	L 2 - 8-0-7												
5	DF Magnesium Sul				0.50	0.60							
	DF Iron Sul												
	DF Manganese Sul												
5.5	SOL-U-BOR						1.10						
115	D - TSP		53										
2,000	POULTRY LIT.	38	14	42	7	2	1	0.2	0.3		0.26		
	D - KCL												
	D - TIGER 90												
	S - pHast-Cal												
250	D - SPM			54		28	54						
	F - POT NIT												
	F - MKP												
	L - 11-37-0												
	L - 32-0-0												
	D - POT SUL												
10	F - Foliar-Cal				1			0.01					
	L 3 - 5-0-10												
	L - 14-0-7												
	DS 1 - 8-18-8												
TOTAL ADDED NUT.		38	67	95	8	30	56	1.11	0.2	0.3	0.26		
Nutrient Deficit		(8)	(3)	(1)	533	92	(145)	(0.01)	(0.7)	(0.6)	2.5 (3.60)		
NOTE:	pH for peanuts should be between 5.5 - 6.8 for optimum growth with 5.8 - 6.2 being the ideal range.									If P ₂ O ₅ starter enter 1		1	
Abbreviation definition	L = Liquid, D = Dry, A = Amendment, LS = Liquid Starter, DS = Dry Starter, F = Foliar Numbers indicate order of use in the program.												

Preplantvariable rate application of the Dolomitic Limestone and application of Gypsum @ 1,200 lb/ac should be considered. The limestone should/can be applied two months prior to the crop/field preparation and this will allow for soil movement and pH adjustment. The Gypsum should be applied on either side of the row or it can be broadcast to help/aid with calcium uptake in the pegging zone. Adequate moisture to move the calcium into the soil should be used. Preplant apply the poultry manure (1 ton/ac) ahead of planting, preferably durin the late fall or early winter to allow sufficient mineralization to occur.

FERTILIZER BLEND ANALYSIS FROM CALCULATION SHEET

SHEET 2

DATE	11/02/16	(Use this information to order Blended Fertilizer from Supplier)												
TEST DATE	10/14/16	FIELD	DP4E 1-20					CUSTOMER	EXAMPLE					
NUTRIENTS		N	P ₂ O ₅	K ₂ O	Ca	Mg	S	B	Zn	Mn	Fe	Cu		
TOTAL REQUIRED		30	64	95	541	123	(90)	1.100	(0.49)	(0.35)	2.50	(3.340)		
LB/AC	ANALYSIS	1	3	4	21.6	4.9		0.044			0.10			
	L - 19-0-0	19%												
	L - 0-6-18		6%	18%		0.3%		0.080%		0.65%		0.027%		
	L 1 - 7-0-8	7%		8%	0.4%		3.0%	0.030%		0.40%				
	L 2 - 8-0-7	8%		7%	0.4%			0.030%	0.05%	0.30%	0.20%			
5	DF Magnesium Sul					10.0%		12.0%						
	DF Iron Sul							12.0%			20.00%			
	DF Manganese Sul							14.0%		25.00%				
6	SOL-U-BOR							20.000%						
115	D - TSP		46%											
2000	POULTRY LIT.	1.91%	0.72%	2.08%	0.35%	0.12%	0.06%		0.011%	0.01%		0.013%		
	D - KCL			60.0%		0.1%								
	D - TIGER 90						90.0%							
	S - pHast-Cal				20.0%									
250	D - SPM			21.5%		11.0%	21.5%							
	F - POT NIT	13.5%		44.0%										
	F - MKP		52.0%	34.0%										
	L - 11-37-0	11.0%	37.0%											
	L - 32-0-0	32.0%												
	D - POT SUL			50.0%			17.0%							
10	F - Foliar-Cal				9.0%			0.10%						
	L 3 - 5-0-10	7%		7%		0.5%		0.030%	0.05%	0.30%	0.20%			
	L - 14-0-7	14%		7%		0.5%	3.0%			0.60%				
	DS 1 - 8-18-8	8%	18%	8%		4.0%	12.2%	0.100%		0.80%				
NUTRIENTS FROM BLENDS		38	67	95	8	30	56	1	0	0		0		
COMBINED NUT. STATUS		(8)	(3)	(1)	533	92	(145)	(0.010)	(0.72)	(0.61)	2.50	(3.60)		
NUTRIENTS		N	P ₂ O ₅	K ₂ O	Ca	Mg	S	B	Zn	Mn	Fe	Cu		
Recommendations made on this report are based on soil and other information as supplied by the grower or his agent. Seasonal adjustments may be necessary due to weather, variety, cultural practices, irrigation or disease/pest conditions encountered during the growing season. BMP guidelines should be followed to avoid excess application of nitrogen and/or phosphorus that could leach or otherwise impair ground waters, streams or other bodies of water.				LIME AND/OR GYPSUM				The attached suggested Dry Starter Blend sheet can be printed and sent to the fertilizer company for preparation of the materials. Substitutions can be made, however, total nutrient adjustment should be considered when this is done and the Calcium Nitrate included in the blend is very important to maintain in the program.						
				APPLY GYPSUM AT		1,200	Lb/Acre							
				APPLY DOLOMITE AT		615	Lb/Acre							
				CORRECT FOLIAR DEFICIENCIES BASED ON EARLY TISSUE ANALYSIS.										
<p>Peanuts are very responsive to foliar applications of calcium and boron. These applications need to be made before pollination is complete. Foliar application of MKP will help promote nutrient uptake and support leaf growth, especially during early stress periods. Both potassium and phosphorus move into the plant via diffusion that is driven by transpiration activity, therefore, any stress or conditions that would limit evapotranspiration provide good opportunity to apply foliar potassium and phosphorus. Rates of FOLIAR-CAL (9% Ca) foliar application are 1/2 - 1 gal/ac/application and MKP at 3 - 6 lb/ac/application. The suggested rates in this program may vary due to conditions present during the early growing period. EARLY NITROGEN APPLICATION OF 20-30 LB N/AC MAY HELP PLANT ESTABLISHMENT (Especially for High Yielding Fields), HOWEVER, LATE APPLICATIONS MAY HURT YIELD. GYPSUM CAN BE APPLIED PRE-PLANT OR BEFORE BLOOM, HOWEVER, PRE-PLANT BROADCAST IS BEST. IF DOLOMITIC LIMESTONE IS USED IT SHOULD ALWAYS BE APPLIED AT LEAST 30 DAYS PRE-PLANT.</p>														

Poultry Litter used as a soil amendment/nutrient source will contribute nutrients to the crop. Estimates of release and availability for nutrients vary with manure source. Plant nutrient needs vary (sequentially) during the growing season, therefore, cropping experience with a manure and application program is better than estimated tables. Keep records of rates, timing, method of application and crop nutrient levels after application to establish an experience log. (See the Crop Nut Charts for removal and crop needs.) A grower could assume that 35 - 70% of the nitrogen, 25% of the phosphorus, 80% of the potassium and around 30% of the other nutrients will be available during a growing season. These assumptions are taken into consideration in the "Estimated Nutrient Available in First Year" and "Estimated Nutrients Available During Plant Season" sections of the calculator below. It is very important to incorporate the manure at least three weeks prior to planting so ammonia release will not inhibit seed germination or cause root problems to the young plants. Rates, timing, method of incorporation, irrigation and soil type all influence release rates and efficiency of nutrient use when manures are used as nutrient sources.

ESTIMATED NUTRIENT RELEASE DURING THE CROP GROWING SEASON

(These are only estimates and may vary due to manure composition, moisture, oxygen availability in the soil, incorporation depth, and incorporation timing).


REPORTED NUTRIENT LEVEL		ESTIMATED NUTRIENT AVAILABLE IN FIRST YEAR		ESTIMATED NUTRIENTS AVAILABLE/SEASON		It is very important that the manure be incorporated into the top 4-6 inches of soil to achieve maximum benefits and to prevent a surface layer of salts that could damage the corn seedlings and reduce yield. Pockets of salts, especially since the manure has ~ 0.6% sodium, could be a problem without incorporation.
Ammonium Nitrogen %	0.52%	80.00%	%/ac/yr Available	7.56	lb/ac/crop PER TON	
organic Nitrogen %	2.81%	60.00%	%/ac/yr Available	30.65	lb/ac/crop PER TON	
Phosphorus P ₂ O ₅ %	3.15%	25.00%	%/ac/yr Available	14.32	lb/ac/crop PER TON	
Potassium K ₂ O %	2.86%	80.00%	%/ac/yr Available	41.60	lb/ac/crop PER TON	
Calcium %	1.76%	30.00%	%/ac/yr Available	7.04	lb/ac/crop PER TON	
Magnesium %	0.450%	40.00%	%/ac/yr Available	2.40	lb/ac/crop PER TON	
Sulfur %	0.480%	30.00%	%/ac/yr Available	1.92	lb/ac/crop PER TON	
Zinc %	0.034%	50.00%	%/ac/yr Available	0.23	lb/ac/crop PER TON	
Copper %	0.039%	50.00%	%/ac/yr Available	0.26	lb/ac/crop PER TON	
Manganese %	0.039%	50.00%	%/ac/yr Available	0.26	lb/ac/crop PER TON	
Sodium %	0.609%	70.00%	%/ac/yr Available	5.68	lb/ac/crop PER TON	
Moisture %	25.1%	NO WARRANTIES OR GUARANTEES ARE MADE OR IMPLIED AS TO THE NUTRIENT VALUE OR RELEASE POTENTIAL BY THIS PROGRAM.			Poultry Litter can vary from site to site and from one season to the next. It is advised to periodically re-test for nutrient content.	

CCS™

PEANUT NUTRITIONAL CHECKLIST

SHEET 4

pH or Nutrient	Soil Test Sufficiency (Mehlich 1)	RECOMMENDATIONS
pH	5.8 - 6.5	Liming to a pH value of 6.3 - 6.4 will maximize soil Ca levels and reduce Zn toxicity if Zn is above 10 lb/ac. Mn deficiency may occur at higher pH levels.
Nitrogen		A low rate of starter nitrogen (20 - 40 lb/ac) may be useful in low CEC or highly leached sandy soils. Use an in-furrow inoculant if the soil has not been in peanuts for 3 years. Excess or late applied N may reduce yields.
Sulfur	40 lb/ac	Sulfur usually is not a limiting factor on peanuts because of gypsum use.
Phosphorus	60 lb/ac	Peanut requirements for phosphorus are lower than other crops because peanuts are very efficient in scavenging for P. Add 30 - 40 lb/ac P2O5/ac if soil test levels are moderate (~ 20 lb/ac P) and 80 - 90 lb/ac if tests are low (<15 lb/ac).
Potassium	50 - 150 lb/ac	If the soil test shows a medium amount of K, add 40 - 60 lb/ac K2O. Do not add more than 150 lb/ac because excessive Potassium can interfere with Calcium uptake by pods.
Calcium	600 - 800 lb Ca/ac 3:1 Ca:K ratio	For Virginia types always use gypsum. Runner type peanuts may not respond to gypsum when calcium levels are above 600 - 800 lb/ac. Gypsum should be applied to insure the basic level in the soil is within this range. Soil pH should be maintained with Dolomitic Limestone. Apply prior to blooming.
Magnesium	60 - 80 lb/ac CEC level ~10% Mg. (Ideal is 12%)	Peanuts mine magnesium very well. Dolomitic Limestone should be used if pH levels are below 5.8 and Base Saturation Mg is less than 10 - 12%.
Boron	0.4 - 0.8 lb/ac	If the soil test is below 0.5 lb/ac, apply foliar Boron at 0.2 - 0.4 lb along with foliar calcium. A good timing would be prior to bloom and with the first fungicide application. Excessive Boron application can cause toxicity.
Manganese	pH 5.8 = 6 lb/ac pH 6.5 = 12 lb/ac	If the soil manganese is too low and the pH is below the target pH, apply foliar manganese at 1 lb Mn/ac (4-5 lb manganese sulfate or Tecmangam). A good time would be with the second fungicide application.
Zinc	Deficient if < 1.6 lb/ac	Zn levels above 10 lb/ac can be toxic if the pH is < 6.0. Dolomitic applications will help alleviate Zn toxicity problems. If high Zn levels are present (> 30 lb/ac) do not plant peanuts. Zn level 6-10 lb/ac = lime to pH 6.2 and Zn level above 20 lb/ac lime to 6.5.
Copper, Chlorine, Iron and Molybdenum	Cu: 0.5 & Fe: 15 lb/ac Mo: 1-2 oz/ac (Inoculant)	No deficiency symptoms have been observed in most growing areas.

WATERS	1	A&L	Summary Soil Test Dated								DATE	10/14/16	CROP	PEANUT					SHEET 4			
CCS	Customer		EXAMPLE					Test Taken By			Buford Creech, CCA				Tested Area			DP4E 1-20				
No.	SAMPLE	P1	P2	K	Mg	Ca	Na	Ph	CEC	%K	%Mg	%Ca	%Na	S	Zn	Mn	Fe	Cu	B	Ds/M	O.M. %	
1	1		45	105	122	1275		6.4	6.2	2.2	8.2	51.2		20	7.3	29	25	5	0.8		1	
1	2		84	168	157	1694		6.6	7.5	2.9	8.7	56.4		20	10.5	32	25	5	0.8		1	
1	3		80	125	88	1372		6.1	6.0	2.7	6.2	57.6		20	10.3	28	25	5	0.8		1	
1	4		71	170	80	1139		6.5	5.4	4.0	6.2	52.7		20	7.7	33	25	5	0.8		1	
1	5		55	178	174	1742		6.5	7.7	3.0	9.4	56.5		20	7.6	35	25	5	0.8		1	
1	6		72	188	166	1781		6.7	7.8	3.1	8.9	57.2		20	9.9	38	25	5	0.8		1	
1	7		64	215	141	1783		6.5	8.1	3.4	7.2	54.9		20	11.5	46	25	5	0.8		1	
1	8		65	175	132	1486		6.6	6.9	3.3	8.0	53.9		20	8.1	39	25	5	0.8		1	
1	9		92	85	102	1133		6.4	5.4	2.0	7.9	52.8		20	8.3	27	25	5	0.8		1	
1	10		104	178	147	1317		6.7	6.1	3.7	10.0	53.7		20	8.7	34	25	5	0.8		1	
1	11		64	223	109	1351		6.8	6.1	4.7	7.4	55.2		20	9.6	24	25	5	0.8		1	
1	12		60	175	136	1486		6.4	6.1	3.7	9.3	60.8		20	9.9	32	25	5	0.8		1	
1	13		65	187	229	2014		6.6	7.8	3.1	12.2	64.3		20	11.8	44	25	5	0.8		1	
1	14		80	128	165	1438		6.8	5.6	2.9	12.2	63.7		20	11.5	40	25	5	0.8		1	
1	15		114	199	162	1745		6.3	7.3	3.5	9.3	59.8		20	12.5	41	25	5	0.8		1	
1	16		71	126	115	1289		6.6	5.1	3.2	9.5	63.6		20	8.6	25	25	5	0.8		1	
1	17		89	128	128	1188		6.8	4.9	3.4	11.0	61.0		20	8.6	24	25	5	0.8		1	
1	18		67	177	99	1157		6.8	4.7	4.8	8.7	61.1		20	8.4	24	25	5	0.8		1	
1	19		57	152	144	1511		6.5	6.2	3.2	9.7	61.2		20	8.6	36	25	5	0.8		1	
1	20		102	154	203	1768		6.7	6.7	3.0	12.7	66.3		20	12.5	44	25	5	0.8		1	
MEASUREMENTS		P1	P2	K	Mg	Ca	Na	Ph	CEC	%K	%Mg	%Ca	%Na	S	Zn	Mn	Fe	Cu	B	Ds/M	O.M. %	
20.0	Total		1501	3236	2799	29669		131.3	127.5	65.44	182.39	1163.99		400.0	191.8	675.0	500.0	100.00	16.00		20.00	
	Avg. ppm		37.5	80.9	70.0	741.7		6.6	6.4	3.3	9.1	58.2		10.0	4.8	16.9	12.5	2.5	0.4		0.5	
	Lb/Ac		75.1	161.8	140.0	1483.5								20.0	9.6	33.8	25.0	5.0	0.8			
	STDEV		14.46	29.14	28.85	217.55		0.15	0.88	0.50	1.39	3.81			1.41	5.95			0.00			
	STD/AVG		0.39	0.36	0.41	0.29		0.02	0.14	0.15	0.15	0.07			0.29	0.35			0.00			
	FLAG		↔	↔	↔	↔									↔	↔						
	Ammend Flag		YES	YES	YES	YES									YES	YES						
	Highest Value		114	223	229	2014		6.8	8.12	4.79	12.69	66.33		20	12.54	46	25	5	0.8		1	
	Smallest Value (SV)		45	85	80	1133		6.1	4.73	2.03	6.15	51.16		20	7.25	24	25	5	0.8		1	
	LOOK AT IF (SV) <		53	103	103	1049								13	6.6	23.3	16.7	3.33	0.53			
		RED NUMBERS = LOW VALUES BLUE NUMBERS = HIGH VALUES GREEN = SUBSTITUTE NUMBERS (NOT TESTED)											CALCULATED AVG. " N " RELEASE FROM O.M./AC/YR					10.0				
													EST. AVG. % N RELEASE/YR. FROM O.M. ~(1-4%)/YR.					2				
													(This release varies with moisture & temp.)									

Phosphorus levels are low for most areas in this block. Variable rate apply TSP was recommended to be applied pre-plant at an average ~ 115 lb/ac to supply needed: N, Phosphorus to the field for the target 7,000 lb peanut yield. Poultry litter should be applied in the late fall or early winter to allow enough time for mineralization to take place. We do not want excess ammoniacial nitrogen on the peanut crop.

Soil pH levels are lower than ideal for peanut (legume) production. The ideal pH would be 6.8 and the average amount of Dolomitic Limestone required would be 615 lb/ac (Dr. Plank equation using the buffer pH, actual soil Water pH, target root depth and target pH). Additional Gypsum was recommended @ 1,200 lb/ac to further supply calcium for pegging and to supply sulfur for legume production. Sulfur addition is very important, however, Sulfur, Iron, Boron, Copper or Orgnic Matter was not tested in these samples. The green numbers are substitute numbers that most probably fit the fields in question. If other numbers are accurate, please substitute them or ask for reformulation.

SPM was recommended at 250 lb/ac to supply additional sulfur, magnesium and potassium for the crop. This material can be broadcast in the fields prior to planting or sidedressed in the row after planting. If sidedressing is used, reduce the amount by 30%. Other materials recommended are MKP and foliar application of Boron and Calcium should be considered to insure adequate root growth, calcium uptake prior to flowering/bloom set and pegging. The SPM rate is standard because of the variable amount of magnesium needed. To vary this rate would proportionally alter/variable apply potassium in the fields.

After evaluation of this program adjustments or modifications can be made to accommodate cultural/application limitations. High yielding Penuts require additional nitrogen to support vigorous initial plant growth to support the nut load on the plants. Additional calcium is also included in this program to insure the pegging zone contains adequate material. The soil pH levels need to be elevated toward 6.8 for optimum performance. The recommended Dolomitic Limestone was made based on the average amount needed to adjust the soil pH to 6.8. Foliar application of nutrients should be considered, especially calcium and boron to help bloom, pollination and pegging. Pathway microbial starter blends should be used for seed treatment and root zone treatment during planting.

Poultry litter use on the preceding crop will supply some nitrogen to the peanuts. I would assume the amount of available N would not be greater than 40 lb/ac from previous applications. If higher rates are available the total amount of starter should be reduced accordingly. This program has a litter component that can be used to adjust the N if litter has been used on these fields withing one year of this program. Pathway microbial inputs should begin early and continue during the season in the foliar sprays and injected in the irrigation system using the Thix Bricks. Foliar tissue testing should begin when the peanut plants have a canopy the size of a baseball and continue every two weeks. Use this information to insure major nutrient levels are adequate as well as Boron.