

New York Starter Phosphorus Project: Does Starter P Fertilizer Impact Silage Quality?

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Dairy producers have been facing increasing pressure to reduce phosphorus (P) inputs in the form of feed and fertilizer. These past three years, on-farm and research station trials were conducted to determine if band-applications of fertilizer P are needed for optimum yield and quality of corn for silage on fields that test high or very high in P. The results (see "What's Cropping Up?" (2004) 14 (1): 1-3) indicated that for sites that test *high* in P and have no manure applications planned for the season, no yield penalty is expected when P starter levels are *reduced* below 25 lbs P₂O₅/acre. On sites that test *very high* in P or when manure is applied to high testing sites, there is a low probability of a starter P response and P could be *eliminated* from the starter without a yield penalty. The one question remaining was: What about silage quality? Table 1 shows the results of the quality analyses for the study. Bottom line is that differences were not significant and well within laboratory analytical uncertainty, indicating that **leaving P out of the starter fertilizer in high or very high P soils did not impact silage quality.**

Table 1: Effect of starter phosphorus addition on corn silage quality in New York State.

Quality parameter	Research Station Trials (9 trials)				On-Farm Trials (62 trials)			
	No Starter	200 lbs 10-0-10 /acre	200 lbs 10-10-10 /acre	200 lbs 10-20-10 /acre	No Starter	N(+K) only	N(+K)+ 10-25 lbs P ₂ O ₅ /acre	N(+K)+ >25 lbs P ₂ O ₅ /acre
	----- % of dry matter-----							
Moisture content	64	65	64	64	60	60	60	59
Neutral detergent fiber	43.5	42.3	43.4	42.8	42.1	42.6	42.7	41.6
	----- % of NDF -----							
Digestibility of NDF	62.2	62.2	62.2	62.6	62.3	60.8	61.7	61.6
	----- lbs -----							
Milk per ton of silage	3692	3699	3700	3703	3734	3652	3683	3712
	----- % of dry matter -----							
Crude protein	7.4	7.3	7.3	7.5	7.6	7.5	7.7	7.6
P	0.21	0.21	0.20	0.20	0.23	0.23	0.23	0.23
K	0.83	0.88	0.85	0.84	1.09	1.09	1.10	1.11
Ca	0.21	0.20	0.19	0.20	0.17	0.18	0.18	0.18
Mg	0.19	0.17	0.17	0.18	0.14	0.14	0.14	0.14
	----- ‰ of dry matter -----							
Zn	16.4	16.6	16.0	15.6	17.6	17.9	17.3	16.5
Cu	4.3	4.3	4.2	4.3	3.8	3.9	3.7	4.1
Mn	17.6	16.9	16.2	16.8	13.3	13.7	13.6	13.7

It is obvious that with the increased attention directed toward P non-point source pollution, it makes little sense to use more starter P than is necessary to support optimum

Table 2: Phosphorus fertilizer guidelines for corn in New York State.

Soil Test P	lbs P ₂ O ₅ /acre	
	With manure	No manure
Very Low	20-30	60-70*
Low	20-30	50-60*
Medium	20-30	25-50*
High	0	0-25
Very High	0	0

* Put ~25 lbs P₂O₅/acre in the starter fertilizer band; balance may be included in the band or broadcast.

yields, especially on fields where significant amounts of manure nutrients are regularly applied. Corn responds to N in the starter band more often than P and we continue to recommend 20-30 lbs of banded starter N, even where P is eliminated. We recommend that corn growers test their fields for soil fertility status at least once in three years, apply manure to low and medium P fields and adjust starter P application rates accordingly (Table 2).

For Further Information

For further information contact your local Cornell Cooperative Extension office. You could also contact Quirine M. Ketterings at (607) 255 3061 or qmk2@cornell.edu and/or visit the New York Starter P Project website: <http://nmsp.css.cornell.edu/projects/starterp.asp>.

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