Provisional Phosphorus Recommendations for Potato

Recent potato P rate research results

Current Potato Phosphorus Recommendations

Mehlich 3 Extractable Soil Phosphorus Index (mg/kg)			
	Low	Medium	High
	≤ 25	26 - 45	>45

	P_2O_5		
	Low	Medium	High
	(lb/A/crop season)		
Potato[1]	120	100	0

[1] Potatoes planted in cool soils might respond to up to 25 lb P_2O_5 applied as starter fertilizer in the furrow with the seed pieces. See also Footnote 253 in Table 4 in UF/IFAS Standardized Nutrient Recommendations for Vegetable Crop Production in Florida (https://edis.ifas.ufl.edu/cv002).

Source: 2022/2023 Vegetable Production Handbook

Recent Potato Research

- Hastings (TCAA) conducted by David Liu – 3-year large-scale study 2018-2020
  - Three P_2O_5 rates – 25, 50, and 100 lb ac^{-1}
  - Two farms each year
  - Randomized complete block design with 4 reps
- Nutrient Management LBR studies
  - 6 studies in or near HAEC
  - 1 study near GCREC
  - 2 studies near SWFREC
  - Six P_2O_5 rates – 0, 45, 90, 135, 180, and 225 lb ac^{-1}
  - Randomized complete block design with 4 replications

eturn in Farms A and B.

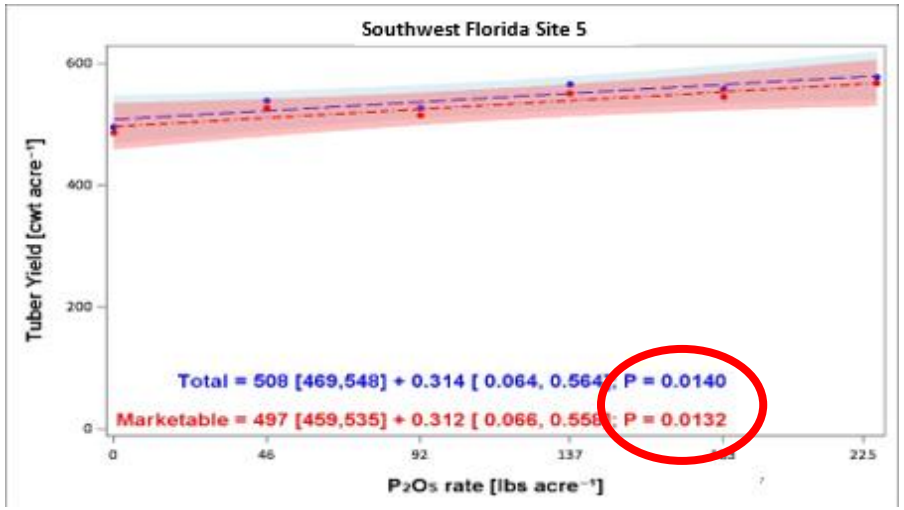
Mean Yield Response From Three Year Studies

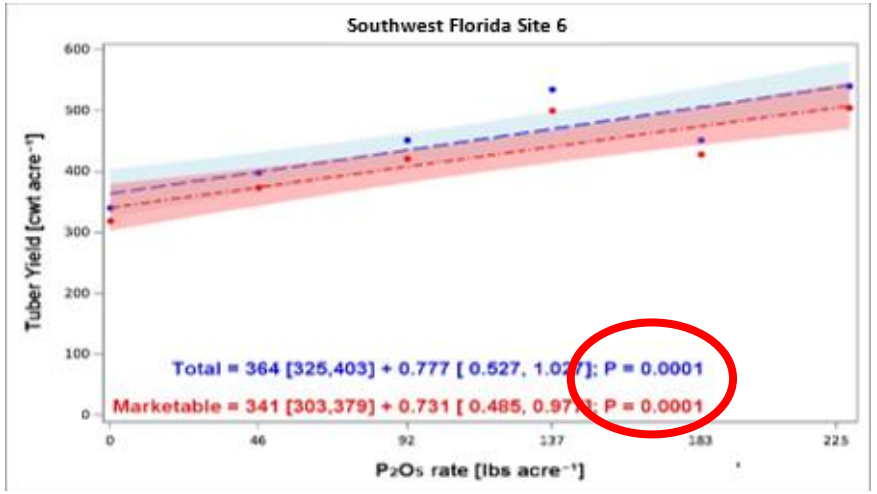
Farm	Year	P Rate (lb ac^{-1})	Yield (CWT ac^{-1})
Farm A	2018–2020	25	386.4
		50	390.0
		100	400.6
Farm B	2018–2020	25	347.2
		50	360.6
		100	375.7

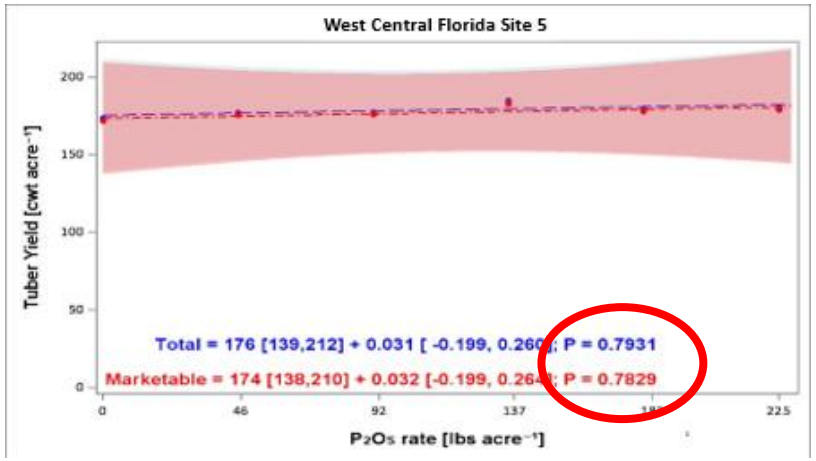
Soil Test and Yield Results for LBR Studies

Site number	Crop	Beginning M1-P	Beginning M1-P Index	Beginning M3-P	Beginning M3-P	Total Yield Significance	Total Yield at 0 P_2O_5 rate
Southwest Florida (Hendry, Glades, and Collier counties)							
SWFla-5	Potato	198 ± 26	Very High	208 ± 23	High	**	508
SWFla-6	Potato	179 ± 32	Very High	167 ± 19	High	***	364
West Central Florida (Manatee and Hillsborough Counties)							
WCFla-5	Potato	90 ± 20	Very High	119 ± 29	High	NS	176
Northeast Florida (St Johns County)							
NEFla-1	Potato	167 ± 29	Very High	314 ± 57	High	***	386
NEFla-2	Potato	69 ± 9	Very High	198 ± 18	High	***	354
NEFla-3	Potato	30 ± 10	Medium	67 ± 14	High	***	286
NEFla-4	Potato	140 ± 28	Very High	281 ± 58	High	NS	253
NEFla-5	Potato	**Study ended because of errant fertilizer application**					
NEFla-6	Potato	186 ± 27	Very High	330 ± 47	High	**	400

Southwest Florida Yield Response

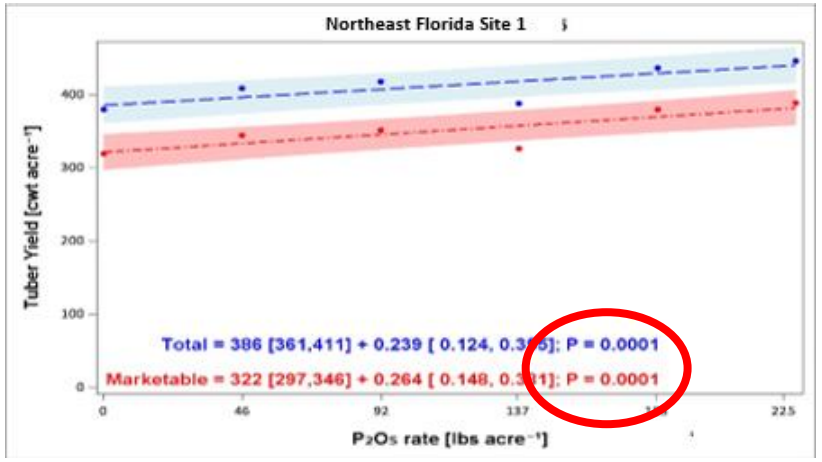


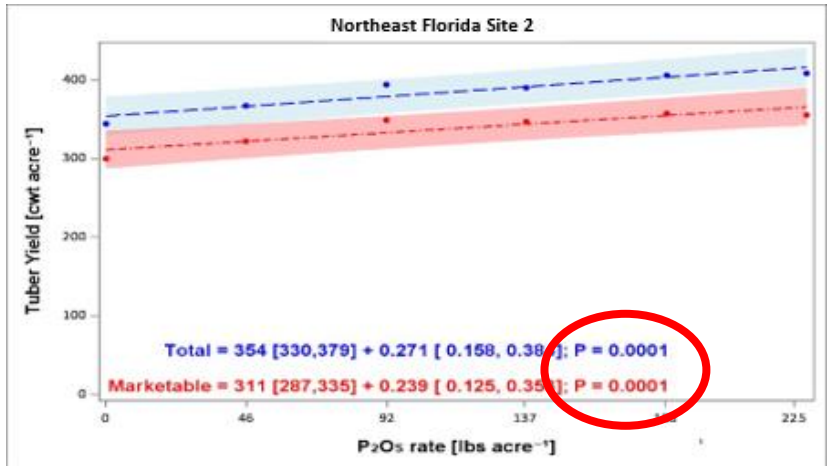


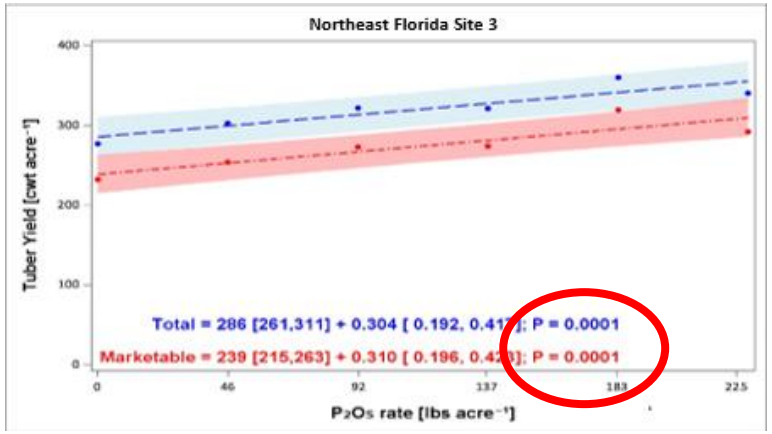


Note: Not Significant, low yield as a result poor crop growth because of frost damage

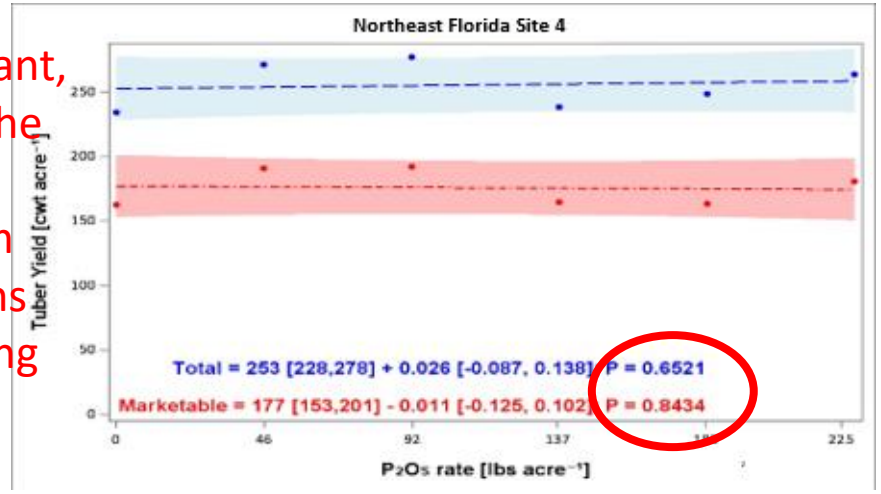
Northeast Florida Yield Results

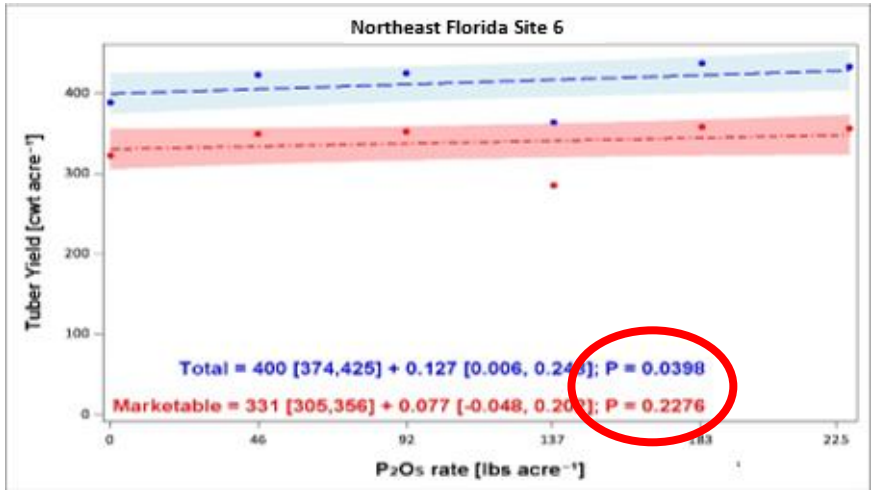






Note: Not Significant, lower yield than the other sites due to less than optimum weather conditions early in the growing season





Suggested Provisional Potato Phosphorus Recommendations

- Soil Tests – recent research results found that potato yield increased with increasing phosphorus rates at current IFAS recommended high M1 and M3 index values.
  - Recommendation – suspend use of M1 and M3 soil test requirements for fertilizer applications until better data are found.
- Yields increased with increased phosphorus rates up to 100 lb/ac P2O5 in the Liu studies, and up to 225 lb/ac for LBR studies.
  - Recommendation – use existing IFAS fertilizer P rates for low M1 and M3 soil test of up to 120 lbs/ac (+ 25 lbs/ac in cold soils) supplemental fertilizer application.