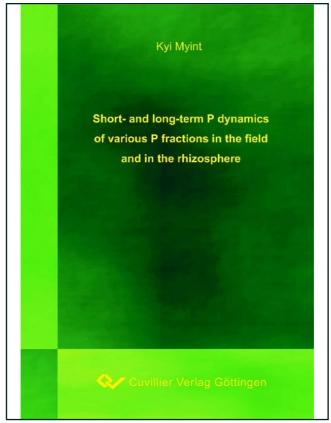


## Kyi Myint (Autor)

## Short- and long-term P dynamics of various P fractions in the field and in the rhizophere



https://cuvillier.de/de/shop/publications/2467

## Copyright:

Cuvillier Verlag, Inhaberin Annette Jentzsch-Cuvillier, Nonnenstieg 8, 37075 Göttingen, Germany

Telefon: +49 (0)551 54724-0, E-Mail: info@cuvillier.de, Website: https://cuvillier.de

## Contents

С	ontents		l
Α	bbreviation	1	IV
Li	st of tables	S	V
Li	st of figure	S	VII
Li	st of apper	ndices	IX
S	ummary		i
1	Genera	I Introduction	1
	1.1	Principal objective of the study	1
	1.2	Phosphorus forms in soil	
	1.3	Phosphorus fixation	
	1.4	Phosphorus transformation and availability in soils	
	1.5	Phosphorus fractions defined by the extractants	
	1.6	General hypothesis and objectives of the study	
2	soil of	phosphorus fractions in the long-term experiments at the loamy Reinshof and at the sandy soils of Eickeloh, Düshorn and agen	8
	2.1	Introduction	8
	2.2	Materials and methods	9
	2.2.1	Experimental sites	9
	2.2.2	Experimental design	10
	2.2.3	Soil sampling	12
	2.2.4	Analytical procedure	12
	2.2.4	1 Phosphorus fractionation	12
		2 Determination of separate total-P	
	2.2.5	Data analysis	
	2.3	Results	
	2.3.1	Changes in P fractions as related to P fertilization and long-term cropping at Reinshof	
	2.3.1	1 NaHCO <sub>3</sub> –P <sub>i</sub>	16
	2.3.1	2 NaHCO <sub>3</sub> -P <sub>0</sub>	19
		3 NaOH-P <sub>i</sub> 4 NaOH-P <sub>o</sub>	
	2.3.1	5 HCI-P	22
	231	6 Conc HCLP	23

	2.3.1. 2.3.1.	7 Residue-P	25 26
	2.3.2	Changes of P fractions as related to P fertilization and long-term cropping at acid sandy soils in Eickeloh, Düshorn and Hodenhagen	
	2.3.2. 2.3.2. 2.3.2. 2.3.2. 2.3.2.	1 NaHCO <sub>3</sub> -P <sub>i</sub>	29 31 32 33
	2.4	Discussion	34
3	compari	rm P depletion of different P fractions in the rhizosphere and its son to the depletion pattern induced by artificial P removal from solution	42
	3.1	Introduction	42
	3.2	Material and methods	45
	3.2.1	Design of the experiment	45
	3.2.2	Preparation of pots and fertilization	46
	3.2.3	Two compartment tube for rhizosphere soil collection	46
	3.2.4	Seedling preparation and planting	48
	3.2.5	Rhizosphere soil sampling	49
	3.2.6	Plant Analysis	49
	3.2.6.	1 Harvest and P determination	
	3.2.7	Soil analysis	51
	3.2.7.	<ul><li>1 Concentration of P in soil solution</li><li>2 Determination of Calcium-Acetate-Lactate P (CAL-P)</li><li>3 Soil P fractionation in the rhizosphere</li></ul>	51
	3.2.8	Artificial P removal from the soil solution	52
	3.2.8.	<ul><li>1 Iron oxide impregnated filter paper</li><li>2 Phosphorus adsorbing property of the Fe-strip</li><li>3 Phosphorus desorption from the soil sample by the Fe-strips</li></ul>	52
	3.2.9	Statistical Analysis	54
	3.3	Results	55
	3.3.1	Maize	55
	3 3 1	Absolute and relative dry matter yield of maize	55

	5.5.1.2 Phosphorus concentration in soil solution and CAL-P as	
	related to soil type, P fertilizer and plant age	56
	plant age	58
	3.3.1.4 Phosphorus uptake and P influx by maize as related to soil type, P fertilizer and plant age	60
	3.3.1.5 Changes in the P fractions in the rhizosphere of maize at the first harvest	61
	3.3.1.6 Changes in the P fractions in the rhizosphere of maize at the second harvest	63
	3.3.1.7 Changes in the P fractions in the rhizosphere of maize at the third harvest	65
	3.3.2 Oilseed rape	66
	3.3.2.1 Dry matter yield and relative yield of oilseed rape	66
	3.3.2.2 Phosphorus concentration in soil solution and CAL-P as related to soil type, P fertilizer and plant age	67
	3.3.2.3 Shoot P concentration and pod P concentration in oilseed rape as related to soil type, P fertilizer and plant age	69
	3.3.2.4 Root length and root length-shoot weight ratio of oilseed rape	
	3.3.2.5 Phosphorus uptake and P influx by oilseed rape as related to	70
	soil type, P fertilization and plant age	73
	3.3.2.7 Changes in the P fractions in the rhizosphere of oilseed rape at the second harvest	73
	3.3.2.8 Changes in the P fractions in the rhizosphere of oilseed rape at the third harvest	76
	3.3.3 Soil P depletion induced by artificial removal of P from the soil solution (Fe-strip)	77
	3.3.3.1 Changes in the P fractions from bulk soil after depleting by maize roots or Fe-strip at 70 days after transplanting	77
	3.3.3.2 Changes in the P fractions from bulk soil after depleting by oilseed rape roots or Fe-strip at 56 days after transplanting	
;	3.4 Discussion	
4	Conclusions	89
5	References	
6	Appendices	. 102

Acknowledgement

Curriculum Vitae