

Field D: Phosphate fertilization trial



The complex of six fertilization trials was established by Karl Schmalfuß in 1949 to examine the response of crops and soil to different doses and kinds of fertilizers.

In this trial the test of increasing application rates of P fertilizers is combined with the comparison of three forms of P fertilizers.

The fertilization is applied annually or triennially. Therefore, the P amounts are 0, 15, and 45 kg P/ha (annual), and 0, 45, and 135 kg P/ha (triennial), respectively.

P fertilizer forms are basic slag (a) and superphosphate (b1 and b2). Previous trial parts with Rhenania phosphate were discontinued in 1995.

The crop rotation includes: *alfalfa– alfalfa – potato – winter rye – sugar beet – barley*, with only one crop being grown each year.

The field is 4615 m² in size, each plot 30 m² (not randomized, four replicates).

Geographical position

Julius-Kühn-Field, Halle, 113 m above sea level	Eastern foreland of Harz Mountains (East Germany)	51° 28' 58.44 N 11° 58' 9.48 E
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Climate (1981-2010)

Annual mean air temperature	Annual average sum of precipitation	Average sum of precipitation April-July
9.7 °C	490 mm	48 mm

Soil conditions

Soil type	Sand	Silt	Clay	Humus content (A _p horizon)	Atmospheric N deposition
Sandy loess (80-120 cm)	69 %	22 %	9 %	2.1 to 2.6 %	40-50 kg/(ha*a)

Current experimental set up (complete systematic block design)

	a	b 1	b 2	a	b 1	b 2	N
triennial	P3	P3	P3	P3	P3	P3	↓
	P1	P1	P1	P1	P1	P1	
	P0	P0	P0	P0	P0	P0	
annual	P3	P3	P3	P3	P3	P3	
	P1	P1	P1	P1	P1	P1	
	P0	P0	P0	P0	P0	P0	
triennial	P3	P3	P3	P3	P3	P3	
	P1	P1	P1	P1	P1	P1	
	P0	P0	P0	P0	P0	P0	
annual	P3	P3	P3	P3	P3	P3	
	P1	P1	P1	P1	P1	P1	
	P0	P0	P0	P0	P0	P0	



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a = Basic slag phosphate
b = Triple superphosphate

Fertilization rates (kg/ha/year)

Nutrient	Alfalfa I	Alfalfa II	Potato	Winter rye	Sugar beet	Spring barley
Annual P-fertilization						
N	0	0	50	40	160	50
K	400	0	250	125	250	125
P0	0	0	0	0	0	0
P1	15	15	15	15	15	15
P3	45	45	45	45	45	45
Triennial P-fertilization						
N	0	0	50	50	160	50
K	400	0	250	125	250	125
P0	0	0	0	0	0	0
P1	45	0	0	45	0	0
P3	135	0	0	135	0	0