

Field A: Lime 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 rates and forms of fertilizers.

In the Lime fertilization trial four Ca fertilization levels have been tested: 0, 0.5, 1.0, 2.0 t CaO/ha every three years after the harvest of spring barley in three replicates. Three divisions (A1, A2, A3) allow for simultaneous cultivation of legumes, cereals, and root crops. N and K amounts are crop specific, but the same for all treatments. During the course of the trial, some changes from the original setup occurred. After 1980 only the first row of plots of each division was further fertilized with P. From 2002 to 2014, 100 kg/ha Mg was applied to the first and second row of each division.

The crop rotation includes *field beans – potatoes – spring barley, field peas – sugar beet – spring barley*.

The field is 3800 m² of size, each plot 30 m² (not randomized, three replicates in each division).

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)

A1			A2			A3		
p*	-	-	P	-	-	P	-	-
Mg**	Mg	-	Mg	Mg	-	Mg	Mg	-
2	2	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1	1
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0	0	0	0	0	0	0	0	0
2	2	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1	1
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0	0	0	0	0	0	0	0	0
2	2	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1	1
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0	0	0	0	0	0	0	0	0

Numbers indicate the amount of CaO (t/ha) applied every 3rd year, after spring barley

N↑



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Fertilization rates

Nutrient	Spring barley	Field bean/ Field pea	Potato/ Sugar beet
N (kg/ha)	60	-	120
P (kg/ha) *	20	40	40
K (kg/ha)	125	125	250
CaO (t/ha)	-	0, 0.5, 1, 2	-
Mg (kg/ha) **	100	100	100

* since 1980, only in the first row of each division

** 2002-2014, only in the first and second row of each division