

# 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. Since 2002, 100 kg/ha Mg is applied to the first and second row of each division.

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

The field is 3800 m<sup>2</sup> of size, each plot 30 m<sup>2</sup> (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 <sub>p</sub> 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 3<sup>rd</sup> year, after spring barley

N↑



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### Fertilization rates

Nutrient	Spring barley	Field bean	Pea	Potato	Sugar beet
N (kg/ha)	60	-	-	120	160
P (kg/ha) *	20	20	20	40	40
K (kg/ha)	125	125	125	250	250
CaO (t/ha)	0, 0.5, 1, 2	0, 0.5, 1, 2	0, 0.5, 1, 2	0, 0.5, 1, 2	0, 0.5, 1, 2
Mg (kg/ha) **	100	100	100	100	100

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

\*\* since 2002, only in the first and second row of each division