

## Field C: Potassium 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 potassium (K; kalium) fertilization trial four K forms and four K amounts are tested on a crop rotation of *potato – silage maize – spring wheat – sugar beet – spring barley*. Each crop is grown in every year (main plots a-e).

K amounts (K0-K4) are 0, 40, 80, 160 kg K/ha to cereals, and 0, 80, 160, 320 kg K/ha to root crops as muriate of potash.

K forms (I-IV) include *Kainite*, muriate of potassium, potassium sulfate, *Kamex*. In this part of the trial they are applied on the level K2 (80 kg K/ha to cereals; and 160 kg K/ha to root crops).

The field is 5358 m<sup>2</sup> of size, each plot 30m<sup>2</sup> (not randomized, three replicates).

The results show a large K release potential of the sandy loess due to its illitic clay minerals.

### 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)

a		b		c		d		e		N↑
K4	IV	K4	IV	K4	IV	K4	IV	K4	IV	
K2	III	K2	III	K2	III	K2	III	K2	III	
K1	III	K1	III	K1	III	K1	III	K1	III	
K0	I	K0	I	K0	I	K0	I	K0	I	
K4	IV	K4	IV	K4	IV	K4	IV	K4	IV	
K2	III	K2	III	K2	III	K2	III	K2	III	
K1	III	K1	III	K1	III	K1	III	K1	III	
K0	I	K0	I	K0	I	K0	I	K0	I	
K4	IV	K4	IV	K4	IV	K4	IV	K4	IV	
K2	III	K2	III	K2	III	K2	III	K2	III	
K1	III	K1	III	K1	III	K1	III	K1	III	
K0	I	K0	I	K0	I	K0	I	K0	I	



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I *Kainite*; II muriate of potash; III potassium sulphate;  
IV *Kamex* (all applied on the level K2; see table below).

### Fertilization rates (kg/ha/year)

Nutrient	Potato	Maize	Spring wheat	Sugar beet	Spring barley
N	150	150	60	160	50
P	40	40	20	40	20
K0	0	0	0	0	0
K1	80	80	40	80	40
K2	160	160	80	160	80
K4	320	320	160	320	160