

Field experiment of potato cultivation (an example)

Purpose: Effects of chemical fertilizers and organic fertilizers are compared.

Chemical fertilizer plot (1): Standard application rates in Hokkaido are adopted.

Chemical fertilizer plot (2): Blended fertilizer for potato is used with the same nitrogen rate as (1).

Organic fertilizer plot (3): Mixture of fish meal and rape seed residue is used with the same N rate as (1) and (2).

Organic fertilizer plot (4): The same organic fertilizer supplemented with K and P so that the rates of N, P, K become the same as (2).

Potato variety: Kita-akari

Area of 1 plot: 5 m x 5 m = 25 m²

6 rows in one plot, with 80 cm distance between the rows.

Numbers of seed potatoes: 90 / plot.

Blended fertilizer composition:

N 5.28 %, P₂O₅ 25.4 %, K₂O 10.6%, MgO 4.84 %

Phosphate fertilizer composition:

P₂O₅ 40 %, MgO 5%

Organic fertilizer: Rape seed 65%, fish meal 35%

N 6%, P₂O₅ 3%, K₂O 1%

Potassium sulfate:

K₂O 50 %

Ammonium sulfate:

N 21%

Treatments and fertilizer application rates:

Applied amount /10 a	Basal dose (kg /10a)			Supplemented (kg /10a)	
	Blended F.	Organic F.	Ammonium S.	P fert.	K sulf.
1) Blended fertilizer	113.6	0	0	0	0
2) Chemical fertilizers with standard NPK	0	0	28.6	50	24
3) Organic fertilizer	0	100	0	0	0
4) Organic fertilizer + PK	0	100	0	42.5	22

Doses of constituents /10 a	Basal dose (kg /10a)			Supplemented (kg /10a)		Total dose (kg /10a)		
	N	P ₂ O ₅	K ₂ O	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
1) Blended fertilizer	6	28.9	12	0	0	6	28.9	12
2) Chemical fertilizers with standard NPK	6	0	0	20	12	6	20	12
3) Organic fertilizer	6	3	1	0	0	6	3	1
4) Organic fertilizer + PK	6	3	1	17	11	6	20	12

Doses (kg /25 m ²)	Doses (kg /25 m ²)					total	per row
	Blended F.	Organic F.	Ammonium S.	P fert.	K sulf.	kg	kg
1) Blended fertilizer	2.84	0	0	0	0.00	2.84	0.47
6) Chemical fertilizers with standard NPK	0	0	0.715	1.25	0.6	2.052	0.34
3) Organic fertilizer	0	2.5	0	0	0	2.50	0.42
4) Organic fertilizer + PK	0	2.5	0	1.063	0.55	4.113	0.69

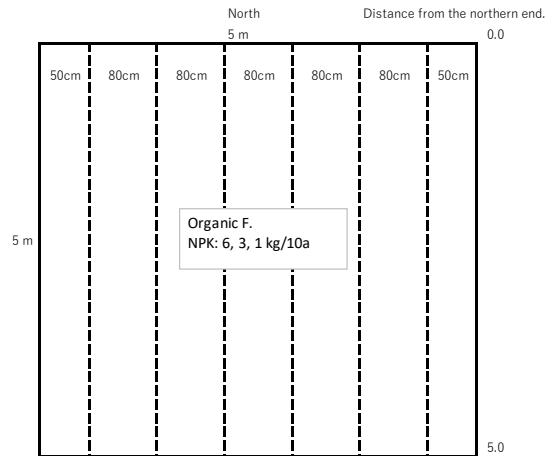
Doses /row	Doses (kg /row)					Total
	Blended F.	Organic F.	Ammonium S.	P fert.	K sulf.	kg
1) Blended fertilizer	0.47	0.00	0.00	0.00	0.00	0.473
6) Chemical fertilizers with standard NPK	0.00	0.00	0.12	0.208	0.10	0.342
3) Organic fertilizer	0.00	0.42	0.00	0.00	0.00	0.417
4) Organic fertilizer + PK	0.00	0.42	0.00	0.177	0.092	0.686

Standard application rates of NPK for potato in Hokkaido.

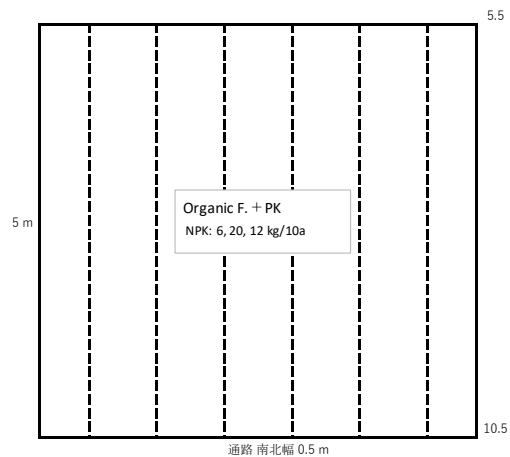
N	P ₂ O ₅	K ₂ O
6	20	12

Design of potato field plots

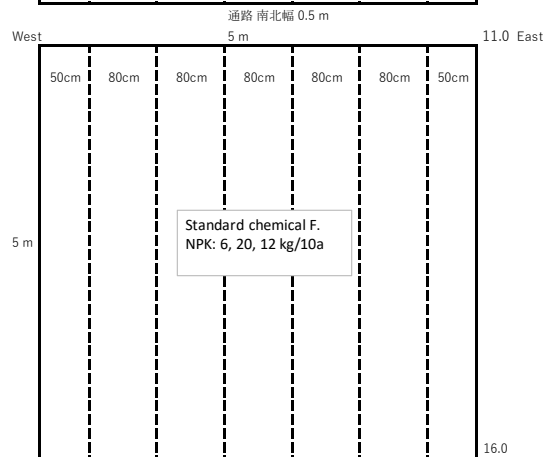
Repetition: 2



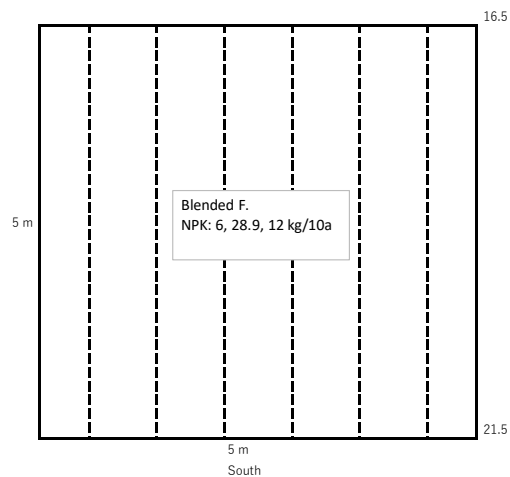
	Doses (kg /25 m ²)	Dose (kg/row)
Organic F.	2.5	0.42



	Doses (kg /25 m ²)	Dose (kg/row)
Organic F.	2.5	0.42
P fertilizer	1.06	0.177
K sulfate	0.55	0.092



	Doses (kg /25 m ²)	Dose (kg/row)
Ammonium Sul.	0.715	0.12
P fertilizer	1.25	0.208
K sulfate	0.6	0.1



	Doses (kg /25 m ²)	Dose (kg/row)
Blended F.	2.84	0.47