

付表および付図

Attached list 1. Mein field crops in Hokkaido in recent years

Year	Sugar beet	Potato	Wheat & barley	Pulse	Vegetables	Forage crops	Total
	ha	ha	ha	ha	ha	ha	ha
1970	54100	69800	39000	127100	48700	364200	702900
1971	54300	70100	35700	125900	47800	419200	753000
1972	57800	73600	30200	131400	48800	453600	795400
1973	61800	74900	27500	124800	49200	486600	824800
1974	47500	68700	31900	123000	51000	510400	832500
1975	48100	71400	36900	105600	49400	531500	842900

Note: It referred to the year book of Agricultural and Fishery Statistics in Hokkaido

Attached list 2. The measurement for roor rot disease of sugar beet in Hokkaido in 1964 (fields and date of observation)

Field No.	Pre- fecture	Address	1st observation (in growth) date	2nd observation (on harvest) date	Degree of infection of the zone by forecasting	Company in charge (fuctory)
1	Tokachi	Satsunai Makubetsucho	Aug. 21	Oct. 18	Severe	Nitten (Obihiro)
2	do.	Nisshin Memurocho	27	29	do.	do.
3	do.	Suzuran Otofukecho	21	13	do.	do.
4	do.	Nintoku Toyokorocho	20	19	do.	do.
5	do.	Beppu Obihiroshi	21	17	Middle	do.
6	do.	Nakataiki Taikicho	20	18	do.	do.
7	do.	Nakasatsunaicho	24	12	do.	do.
8	do.	Tetsunan Sarabetsucho	22	Nov. 7	do.	do.
9	do.	Goinoichi Makubetsucho	21	Oct. 8	Minor	do.
10	do.	Toyocoro Hiroocho	23	7	do.	do.
11	Kushiro	Teshikagacho	Sept. 1	17	Severe	Nitten (Isobunai)
12	do.	do.	1	17	do.	do.
13	do.	do.	1	17	do.	do.
14	do.	do.	1	17	do.	do.
15	do.	Shiranukacho	Aug. 24	15	Minor	do.
16	do.	Ohonae Shiranukacho	24	15	do.	do.

(Continuance from the previous page)

17	Nemuro	Bekkaicho	25	25	do.	do.
18	do.	do.	25	25	do.	do.
19	do.	Hiraito Bekkaicho	29	11	do.	do.
20	do.	do.	29	11	do.	do.
21	Abashiri	Bikin Bihorocho	29	6	do.	Nitten (Bihoro)
22	do.	do.	31	6	do.	do.
23	Kamikawa	Kamifuranochi	20	12	Severe	Nitten (Shibetsu)
24	do.	do.	20	12	do.	do.
25	do.	Nakafuranochi	20	12	do.	do.
26	Sorachi	Furukawakita Yunicho	24	24	do.	do.
27	Kamikawa	Murayama Bieicho	20	9	Middle	do.
28	do.	Okukiusu Bieicho	20	9	do.	do.
29	Kamikawa	Furanochi	Aug. 24	Oct. 12	Middle	Nitten (Shibetsu)
30	Ishikari	Eniwacho	24	23	do.	do.
31	Kamikawa	Shibetsucho	20	12	Minor	do.
32	do.	do.	20	12	do.	do.
33	do.	Nayorocho	26	16	do.	do.
34	Abashiri	Engarucho	27	15	Severe	Shibaura (Kitami)
35	do.	do.	27	15	do.	do.
36	do.	Tannocho	20	14	do.	do.
37	do.	Engarucho	27	15	Middle	do.
38	do.	Kunneppucho	24	19	Minor	do.
39	do.	do.	24	19	do.	do.
40	do.	Rudeshidecho	27	15	do.	do.
41	do.	do.	27	15	do.	do.
42	do.	Engarucho	27	15	do.	do.
43	do.	kitamishi	24	25	do.	do.
44	do.	Saromacho	24	25	do.	do.
45	Tokachi	Shikaoicho	20	26	Severe	Hokuren (Shimizu)
46	do.	Shihorocho	24	7	do.	do.
47	do.	Shimizucho	24	6	do.	do.
48	do.	do.	26	6	do.	do.

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49	do.	Shintokucho	20	17	Middle	do.
50	do.	Shikaoicho	20	26	do.	do.
51	do.	Shihorocho	24	7	do.	do.
52	do.	Shimizucho	24	16	do.	do.
53	do.	Kamishihorocho	25	17	Minor	do.
54	do.	do.	25	29	do.	do.
55	Abashiri	Memanbetsucho	20	31	do.	Hokuren (Nakashari)
56	do.	do.	20	31	do.	do.
57	do.	Abashirishi	20	17	do.	do.
58	do.	do.	20	17	do.	do.
59	do.	do.	20	17	do.	do.
60	Abashiri	Abashirishi	Aug. 28	Nov. 15	Minor	Hokuren (Nakashari)
61	do.	do.	24	Oct. 22	do.	do.
62	do.	Koshimizucho	23	22	do.	do.
63	do.	do.	23	22	do.	do.
64	do.	Sharicho	20	20	do.	do.
65	do.	Kiyosatocho	20	13	do.	do.
66	Tokachi	Ikedacho	31	9	Severe	Dainihon (Honbetsu)
67	do.	Honbetsucho	20	16	do.	do.
68	do.	do.	19	16	do.	do.
69	do.	Ashorocho	24	19	do.	do.
70	do.	Rikubetsucho	21	3	Middle	do.
71	do.	Uraorocho	24	5	do.	do.
72	do.	do.	21	2	do.	do.
73	do.	Ikedacho	29	4	do.	do.
74	Abashiri	Okkopecho	29	10	Minor	do.
75	do.	Monbetsushi	28	9	do.	do.
76	Shiribeshi	Rusutsumura	Sept. 1	28	Severe	Taitoh (Dohnan)
77	do.	do.	1	27	do.	do.

(Continuance from the previous page)

78	Iburi	Datecho	Aug. 18	Nov. 4	do.	do.
79	do.	do.	18	4	do.	do.
80	Shiribeshi	Kimobetsucho	26	Oct. 27	Middle	do.
81	do.	do.	26	27	do.	do.
82	Iburi	Sohbetsucho	28	27	do.	do.
83	do.	do.	28	27	do.	do.
84	Shiribeshi	Kaributocho	24	21	Minor	do.
85	do.	do.	24	21	do.	do.
86	Oshima	Kamedacho	31	—	Severe	do.
87	do.	do.	31	—	do.	do.

Attached list 3. The measurement for root rot of sugar beet in Hokkaido in 1964. (evaluation of injury by root rot disease)

Field No.	in growth stage		on harvest time				
	Infection	Degree of infection	Rotated root	Degree of injury	Die out stand	Total of root weight	Counting of yield decreased
	%	a)	%	b)	%	kg/10a	% c)
1	22.6	6.4	11.6	9.4	3.3	—	—
2	43.7	14.4	20.2	8.2	0.9	2858	15.2
3	15.0	3.0	20.0	10.6	2.8	2285	43.2
4	33.3	12.8	31.5	11.4	0	3018	11.5
5	14.9	3.0	20.7	5.4	1.6	2820	91.6
6	3.9	0.1	2.3	1.8	0	2081	29.0
7	0	0	1.0	1.0	1.1	3079	0
8	4.2	0.1	10.6	4.8	1.6	3057	57.7
9	3.0	0.1	7.8	6.0	5.2	3565	77.3
10	1.3	0	0.2	0.4	0	—	—
11	5.7	1.6	6.2	2.4	0	2566	76.7
12	8.9	3.4	6.3	2.0	0	2967	58.1
13	7.6	2.0	7.4	2.6	0	2441	29.7

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	%			%		kg/10a	%
14	13.4	5.0	11.1	4.6	0	2302	75.2
15	8.7	4.6	18.3	11.8	3.7	1935	44.8
16	11.7	5.6	9.0	7.0	2.3	1861	53.8
17	0.4	0	1.1	0.6	0	2275	41.9
18	1.4	0.8	4.9	4.0	2.5	2148	76.2
19	5.8	0.1	11.6	2.4	0	2533	—
20	3.8	0.1	6.3	2.6	0	2430	39.0
21	11.5	6.6	24.4	16.8	6.3	2316	8.2
22	7.7	3.2	16.9	10.4	4.9	1948	20.4
23	13.8	6.0	28.5	14.8	4.0	2741	68.5
24	39.4	24.0	58.6	41.0	26.8	3540	83.9
25	31.5	13.4	22.7	13.6	6.3	3514	65.6
26	20.2	10.2	32.3	22.2	7.7	2521	83.9
27	38.0	20.0	47.9	28.0	0	2250	55.6
28	68.3	41.2	80.1	53.0	0	1802	86.1
29	4.2	2.8	9.6	7.6	0.3	2654	79.6
30	20.3	10.6	14.7	10.6	0	3478	—
31	1.7	1.0	10.9	8.6	4.1	—	—
32	0.3	0.2	12.0	10.0	7.1	—	—
33	24.2	13.4	40.3	25.6	11.3	2550	33.5
34	23.0	13.4	36.3	29.8	20.5	2441	67.5
35	25.3	9.4	25.6	11.8	3.5	2936	42.4
36	19.9	7.4	37.3	31.2	23.3	2511	60.9
37	45.0	18.2	43.3	27.0	1.0	1920	59.2
38	0.1	0	0	0	0	3092	—
39	2.6	0.8	7.2	4.2	2.6	3082	79.6
40	9.9	3.0	17.5	12.2	7.3	2729	81.2
41	0.4	0.4	12.5	4.4	1.4	2644	76.2
42	7.1	3.2	7.2	4.8	2.8	2321	86.0

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	%		%		%		kg/10a	%
43	7.8	4.4	29.1	18.8	6.7	2696	68.0	
44	4.5	1.8	8.3	3.4	0.5	2925	37.5	
45	29.8	12.0	45.5	20.0	5.8	2947	21.5	
46	44.7	17.2	46.6	39.9	9.3	1516	21.1	
47	9.2	4.8	15.4	13.0	10.4	3078	71.6	
48	62.7	26.8	51.1	30.0	10.5	2323	81.3	
49	24.4	10.4	9.6	5.4	1.4	2837	40.7	
50	13.7	4.0	21.5	7.0	2.7	3251	70.6	
51	15.3	3.0	0	0	0	2164	—	
52	7.7	3.8	17.0	8.0	4.2	3490	73.9	
53	16.1	4.8	22.5	14.8	8.5	2643	39.1	
54	16.4	5.4	17.5	12.8	5.6	2852	58.9	
55	0	0	0	0	0	3301	—	
56	0	0	0	0	0	4217	—	
57	3.9	0.8	8.0	0	0	2275	7.2	
58	3.1	0.6	3.5	2.0	0	2093	10.2	
59	16.8	3.4	17.5	1.0	0	2293	— 13.8	
60	1.1	0.2	0	4.4	0	3658	—	
61	0	0	0	0	0	2958	—	
62	1.2	0.2	0.7	0.2	0	5187	—	
63	0.3	0	1.6	0.8	0	3567	—61.3	
64	20.8	4.2	35.4	7.6	0	3076	53.5	
65	0.2	0	2.4	2.0	1.9	3396	—	
66	31.0	11.6	39.4	17.4	0	2324	18.2	
67	92.5	33.2	57.2	31.6	22.4	943	54.7	
68	19.7	6.2	18.8	8.8	1.9	2242	60.2	
69	24.5	5.8	45.9	23.2	15.0	1652	72.6	
70	6.6	1.4	7.6	5.8	5.1	2115	80.1	

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	%		%		%	kg/10a	%
71	30.2	9.4	44.5	25.2	4.5	1354	63.5
72	22.7	8.8	14.6	12.8	12.8	1555	94.3
73	38.1	20.0	59.2	42.8	23.1	—	—
74	4.4	2.0	16.0	9.2	0.7	2360	70.9
75	6.1	2.2	8.9	4.6	3.4	2059	86.7
76	74.9	45.2	52.1	36.2	0	2839	76.7
77	56.2	20.0	20.9	15.6	0	4799	65.0
78	36.0	18.8	82.3	25.2	1.1	2308	—
79	58.0	24.6	77.9	31.8	18.2	2730	—
80	31.2	12.8	11.9	9.2	2.8	3252	76.3
81	71.1	36.8	20.6	15.0	1.4	3294	77.9
82	40.9	18.2	41.9	18.6	9.3	3370	65.9
83	57.0	24.6	47.7	19.2	7.1	3747	53.6
84	5.5	1.8	10.4	6.4	1.7	2897	77.4
85	2.8	0.6	2.4	0.6	0	3301	20.5
86	67.5	21.0	—	—	—	—	—
87	55.5	14.8	—	—	—	—	—

Note:

$$a) \& b) = \frac{(\text{No. of plants in every class} \times \text{Proper indexes}^x)}{\text{No. of total plants} \times \text{Maximum index}} \times 100$$

* See attached chart 2&3

$$c) = \frac{(\text{The same as denominator}) - (\text{Average of root weight corresponded index 3\&5})}{\text{Average of root weight corresponded 0\&1}}$$

Attached list 4. Surroundings of root rot measurement field of sugar beet in Hokkaido in 1964.
(information about the observed field and the sugar beet cultured zone including it)

Field No.	Observed field		Zone corresponded to this field			
	Soil texture	Infectional degree of this field per that of nearby	Sugar beet area	Severe	Middle	Minor
			ha	ha	ha	ha
1	Sandy loam	Middle	447	20	120	307
2	Loam with volcanic ash	do.	2069	50	60	1959
3	do.	do.	857	5	40	812
4	Loam	High	631	1	10	620
5	Volcanic ash earth	Low	446	2	50	394
6	do.	Middle	403	0	3	400
7	do.	Low	138	0	3	135
8	do.	Middle	265	1	4	261
9	Sandy loam with Volcanic ash	Low	207	0	0	1
10	Loam	do.	161	0	0	161
11	Loam with volcanic ash	High	413	0	15	12
12	do.	do.				
13	do.	do.				
14	do.	do.				
15	Loam	do.	74	0	0	15
16	do.	do.				
17	Volcanic ash earth	Low	943	0	11	35
18	do.	Middle				
19	Loam	do.				
20	do.	do.				
21	do.	High	1731	0	0	1731
22	Sandy loam with volcanic ash	do.				
23	Loam	do.	223	33	54	136
24	Clayish loam	do.				
25	Loam	do.				
26	Sandy loam	Middle	344	15	4	325
27	Clayish loam	High	575	10	55	510

(Continuance from the previous page)

			ha	ha	ha	ha
28	Loam	High				
29	Clayish loam	Middle	770	37	110	623
30	Sandy loam with volcanic ash	do.	202	196	2	4
31	Sandy loam	Low	243	0	10	233
32	do.	do.				
33	Loam	High	116	1	2	113
34	Clayish soil	do.	13	3	4	5
35	do.	do.				
36	Volcanic ash earth	do.	60	5	10	10
37	Clayish loam	do.	7	0	0	1
38	Loam	Low	—	—	—	1
39	do.	do.	—	—	—	0
40	do.	High	526	0	0	15
41	do.	do.				
42	Clayish loam	Middle	10	0	1	2
43	Sandy loam	High	50	1	0	1
44	Clayish soil	Middle	848	0	—	—
45	Loam with volcanic ash		588	147	353	88
46	do.	High	15	3	4	2
47	Clayish loam with volcanic ash	Middle	25	2	3	5
48	Volcanic ash earth	High	25	0	0	0
49	do.	do.	215	45	81	89
50	Sandy loam with volcanic ash	Middle	588	147	353	88
51	Loam with volcanic ash	Low	8	1	6	1
52	Clayish loam with volcanic ash	High	27	1	3	4
53	Loam with volcanic ash	do.	30	—	—	1
54	do.	do.	50	—	—	3
55	Volcanic ash earth	Middle	492	0	0	0
56	do.	do.				
57	do.	High	313	1	10	21

(Continuance from the previous page)

			ha	ha	ha	ha
58	Volcanic ash earth	High				
59	do.	do.				
60	Peat	Middle	494	0	0	0
61	Volcanic ash earth	—	683	0	0	0
62	Sandy loam with volcanic ash	Middle	1926	0	0	30
63	do.	do.				
64	Volcanic ash earth	High	1921	0	0	3
65	Sandy loam with volcanic ash	Middle	1548	3	2	5
66	Loam	High	14	1	1	12
67	Loam with volcanic ash	do.	765	50	190	524
68	Sandy loam	do.				
69	do.	do.	291	44	87	160
70	Loam	Low	210	0	6	204
71	do.	High	611	3	185	329
72	Clayish loam	Middle	448	2	125	241
73	Loam with volcanic ash	do.	310	4	4	303
74	Clayish loam	High	122	0	0	122
75	Clayish soil	do.	379	3	10	366
76	Volcanic ash earth	do.	243	30	60	153
77	do.	do.				
78	Sandy loam	—	641	0	0	0
79	do.	High				
80	Clayish loam	Middle	106	3	5	15
81	Loam	do.				
82	Sandy loam with volcanic ash	Low	189	—	—	—
83	do.	do.	14	—	6	—
84	Loam	Middle	—	—	—	4
85	Clayish loam	do.	—	—	—	—
86	—	Low	27	2	3	5
87	—	Middle	28	2	2	2

Attached list 5. The fungicides used in this paper

Component	Short form
acrylonitrile (CH = CHCN)	AN
benzothazol	BT
bis (dimethyl thiocarbamoyl) disulfide	TMTD
chloropicrin	CP
cycloheximide	Actidione
1,2-dibrom-3-chloropropane	DBCP
dichloroisopropyl ether	DPE
disodiummethylene bisdithiocarbamate	DEDC
ethyl mercury phenethyl	EMPT
ethyl mercury phenyl	EMPH
ethyl mercury phosphate	EMP
hydroxy methyl isoxazol	HMO
lime nitrogen	LN
methyl arsenic chloride	MAC
methyl arsenic dimethyl dithio carbamate	URBAZID
methyl arsenic sulfide	MAS
methyl bromide	MB
methyl mercury iodide	MMI
mercury acetylide	MA
<i>n</i> -methyl dithiocarbamate natrium	VAPAM
pentachloronitrobenzene	PCNB
pentachlorophenol-sodium	PCP
sodium <i>p</i> -dimethylaminobenzene diazosulfonate	DAPA
thioureaform	TUF
triphenyltin acetate	TPTA
zinc dimethyldithiocarbamate	ZIRAM

Attached list 6. Effects on control of root rot and yield of sugar beet with the fungicide used.
(Kimobetsu, 1960)

Fungicide	Element (per 10a)	Aug. 1st		Oct. 22		
		Infection	Die out stand	Roted root	Degree of injury	Root weight (per 10a)
	g	%	%	%		kg
MA (Hg 3%)	30.4 (Hg)	61.4	12.2	86.7	49.3	1982
MMI+EMP (Hg 1.9%)	49.2 (Hg)	53.4	15.9	76.5	38.9	2064
MAS 5%	254.5	62.8	15.6	84.8	43.8	1996
MAC 2.5%	254.5	67.4	10.6	86.0	51.9	2006
TMTD 40%, ZIRAM 20% URBAZID 20%	297.0	72.4	12.5	90.5	48.2	1727
PCNB 20%	2072.0	57.6	15.1	80.3	38.5	2013
PCNB 10%, TMTD 10%	2072.0	67.0	11.4	81.1	38.8	2285
AN 10%	518.0	69.0	13.3	88.6	48.3	1884
PCP 5%,LN (N 1.9%)	4854.0	59.4	17.8	86.4	49.4	1624
No treatment	—	53.4	14.4	84.9	50.0	1801
L. S. D.		—	—	N. S.	N. S.	N. S.

Note: 1) The fungicides are used twice (before sowing and early infecting time).
 2) The field was cultured sugar beet and very severe infected in last year.
 3) The field is designed with randomized 3 repetition and one plot is 14.9m².

Attached list 7. The same as attached list 6. (Kimobetsu, 1960 but the fungicides treated in 1959)

Fungicide	Element (per 10a)	Aug. 1st		Oct. 22		
		Infection	Die out stand	Roted root	Degree of injury	Root weight (per 10a)
	1	%	%	%		kg
TUF 30%	18	61.3	15.7	85.7	49.3	2257
PCNB 20%	6 kg	59.7	8.0	70.0	36.5	2316
PCP 20%	6 Kg	61.0	15.0	79.7	43.0	2145
VAPAM 30%	18	65.0	10.3	84.7	50.5	2033
No treatment	—	65.3	11.7	77.3	44.5	2187
L. S. D.		—	—	N. S.	N. S.	N. S.

Note: 1) The fungicides were treated in soil on Oct. 23, last year.
 2) The field was cultured sugar beet and very severe infected in last year.
 3) The field is designed with randomized 3 repetition and one plot is 16.5m².

Attached list 8. Effects on control of root rot and yield of sugar beet with the fungicides used.
(Kimobetsu, 1961)

Field No.	Fungicide	Element (per 10a)	Oct. 23			
			Die out stand	Roted root	Degree of injury	Root weight (per 10a)
		Kg	%	%		Kg
1	PCNB 20%	4	10.2	45.1	18.4	2262
2	PCNB 10%	4	14.6	52.2	24.6	1911
3	TMTD 80%	16	16.0	59.2	27.8	1983
4	AN 20%	1350 ml	13.1	56.2	23.2	1994
5	PCNB 10%, TMTD 10%	4 Kg	13.6	53.7	23.9	1890
6	PCNB 10%, AN 10%	1350 ml	11.9	59.4	23.4	2200
7	PCNB 10%, MAS 5%	3 Kg	10.0	46.6	18.7	2097
8	PCNB 20%	4	18.3	59.4	30.1	1787
9	PCNB 20%	5.4	14.0	49.5	21.9	2035
10	PCNB 10%	5	9.0	41.2	17.0	2004
11	No treatment	—	12.5	58.8	23.3	2231

Note: 1) The fungicides of No. 1~7 are mixed in all surface soil of each plots before sowing.
 2) The whole dosage at No.8, 1/3 of dosage at No.9, 1/5 of dosage at No.10 were mixed in sowing ditch soil, but 2/3 at No.9 and 4/5 at No.10 were used the same as note 1).
 3) The field was designed with randomized 4 repetition and one plot is 14.9 m².

Attached list 9. The same as attached list 8. (Eniwa, 1962)

Field No.	Fungicide	Element (per 10a)	Oct. 24					
			Die out stand	Roted root	Degree of injury	Root weight (per 10a)	Average of root weight	
							Symptom less	Slight symptom
		Kg	%	%		Kg	g	g
1	PCNB 20%	16	25.6	12.7	7.4	2311	266	517
2	TMTD 80%	64	22.9	12.7	7.5	2174	262	407
3	MMI+EMP 3% (Hg 1.9%)	0.3 (Hg 0.2)	7.9	32.5	21.3	2942	332	468
4	DEDIC 93%	3.72	14.8	32.8	22.3	2909	360	363
5	No treatment	—	13.8	28.3	19.4	2715	348	350
L. S. D. (0.05)			—	8.1	6.1	—	86	148

Note: 1) The use of fungicide is divided 4 times; 1st treatment is mixed in sowing ditch before sowing, 2nd is July 10, 3rd is July 27 and 4th is Aug. 13, that were sprayed on surface soil.
 2) The field is volcanic ash earth with severe infection in last year.
 3) The field is designed with randomized 8 repetition and one plot is 14.9 m².

Attached list 10. Effects on control of root rot and yield of sugar beet with the fungicides used. (Shikaoi, 1962)

Field No.	Fungicide	Element (per 10a)	Oct. 17			
			Die out stand	Roted root	Degree of injury	Root weight (per 10a)
		kg	%	%		kg
1	PCNB 20%	8	17.0	7.7	4.1	2465
2	PCNB 20%+TMTD 80%	6+8	18.5	5.0	2.2	2618
3	PCNB 20%+EMPT 2%	6+0.2	22.1	8.0	3.6	2481
4	No treatment	—	15.6	18.5	12.5	2618
L. S. D. (0.05)			—	55	43	N. S.

Note: 1) The use of fungicide is divided 2 times, 1st treatment is mixed in sowing ditch before sowing, 2nd is sprayed on surface soil on July 20.
 2) The field is sandy loam with volcanic ash and soy bean cultured in last year.
 3) The field is designed with randomized 10 repetition and one plot is 22.3 m².

Attached list 11. The same as attached list 10. (Shikaoi, 1963)

Field No.	Fungicide	Element (per 10a)	Oct. 14				
			Roted root	Degree of injury	Root weight (per 10a)	Sugar content in root	Pure sugar
		kg	%		kg	%	%
1	PCNB 20%	8	29.2	21.6	1949	15.6	87.7
2	PCNB 20%+TMTD 80%	8+16	26.7	15.8	1675	15.3	88.8
3	PCNB 20%+TMTD 80%	6+ 8	20.0	11.3	1804	14.9	86.8
4	PCNB 20%+TMTD 80%	4+16	25.7	16.2	1725	15.2	87.5
5	PCNB 10%	4	39.6	22.2	1808	14.5	86.1
6	PCNB 10%	4	33.9	18.2	1872	14.6	86.7
7	No treatment (1)	—	66.8	29.0	1535	15.6	87.5
8	No treatment (2)	—	67.1	27.5	1535	15.3	87.6
L. S. D. (0.05)			89	79	N. S.	—	—

Note: 1) The use of fungicide is divided 2 times, 1st treatment is mixed in sowing ditch before sowing, 2nd is sprayed on surface soil on July 9.
 2) The field is loam with volcanic ash and severe infection in last year.
 3) The field is designed with randomized 4 repetition and one plot is 20.3 m².

Attached list 12. Effects on control of root rot and yield of sugar beet with the fungicides used. (Shikaoi, 1964)

Field No.	Fungicide	Element (per 10a)		Oct. 28		
		1965	1964+1965	Roted root	Degree of injury	Root weight (per 10a)
		Kg	Kg	%		kg
1	PCNB 10%	4	12	13.2	8.1	1810
2	PCNB 10%+TMTD 40%	2+8	6+24	23.0	17.2	1533
3	PCNB 50%+TMTD 80%+BT 50%	3.8+0+3.8	9.8+8.0+3.8	15.1	10.2	1646
4	TMTD 40%+PCNB 20%	16+0	32+4	19.2	12.5	1736
5	PCNB 10%	0	4	39.0	21.9	1211
6	PCNB 5%	2	6	24.4	18.3	1552
7	PCNB 10%+DAPA 4%	4+1.6	4+1.6	12.9	8.2	2108
8	No treatment	0	0	36.2	17.6	1659
L. S. D. (0.05)				9.2	6.8	295

Note: 1) The use of fungicide is divided 2 times, 1st treatment is 1/2 of dosage mixed in sowing ditch soil before sowing and 2nd is 1/2 of dosage sprayed on surface soil on July 22.

2) The field design is used same as last year test (attached list 11).

3) The variety of sugar beet is polyrave.

Attached list 13. The same as attached list 12. (Shimizu, 1964)

Field No.	Fungicide	Element (per m ²)	DAPA 4% 1Kg/10a used			DAPA no used			Sugar content in root	Pure sugar
			Roted root	Degree of injury	Root weight (per 10a)	Roted root	Degree of injury	Root weight (/10a)		
		g	%		kg	%		kg	%	%
1	MB 98%	36.3	8.3	2.0	2173	14.0	3.1	2236	15.1	83.1
2	CP 98%	23.8 ^{ml}	27.1	7.8	1541	17.8	4.7	1345	14.9	82.5
3	CP 80%	26.4	25.3	5.9	1586	28.0	6.6	1164	14.9	82.8
4	DPE 100%	55.0	14.5	3.3	605	11.4	2.4	364	14.9	82.3
5	No treatment	—	26.2	6.0	1518	31.1	7.0	1054	14.9	84.3
L. S. D. (0.05)			15.1	N. S.	374	15.4	3.2	487	—	—

Note: 1) The fungicide of No. 1 is used in soil with covered film. At No.2, No.3 and No.4, they were injected 20cm under ground with injector. These fields were plowed after 24 days to put gases away.

2) DAPA was mixed in soil at planting time.

3) The field is designed with randomized 3 repetition, one plot of No.1 is 108m². one of No.5 is 156m² and the others were 132m².

4) The variety of sugar beet is Polyrave, planted at May 28, harvested at Oct. 28.

Attached list 14. Control effect of the fungicides to spread of root rot infection of sugar beet.
(Shimizu and Shikaoi, 1964)

Field No.	Fungicide	Element (per m ²)	Infection			Degree of injury		
			Before treatment (A)	treatment 14 days after (B)	B - A	Before treatment (A)	treatment 14 days after (B)	B - A
		g	%	%	%			
1	PCNB 5% (dust)	4.0	43.2	39.2	- 4.0	17.5	11.6	-5.9
2	TMTD 40% (dust)	32.0	47.5	41.1	- 6.4	16.6	10.2	-6.4
3	DAPA 70% PCNB 70% (wettable powder)	0.84 0.45	36.0	42.3	+ 6.3	13.9	12.2	-1.7
4	EMPH 3.3% (emulsion)	0.4	46.9	51.6	+ 4.7	17.6	15.7	-1.9
5	TPTA 20% (wettable powder)	0.96	59.8	72.8	+13.0	27.0	30.2	+3.2
6	TPTA 20% (wettable powder) Actidione 0.5%	0.48 0.01	69.0	80.6	+11.6	29.0	35.5	+6.5
7	No treatment	-	42.7	69.0	+26.3	20.4	20.8	+0.4

Note: 1) The test fields were used 4 places (2 in Shimizu and 2 in Shikaoi) and one treatment plot is 32 plants.
 2) The dust is sprayed by hand duster, the liquid is sprayed 300ml/plant on surface soil at July 22.
 3) The variety of sugar beet is Polyrave.

Attached list 15. Effects on control of root rot and yield of sugar beet with the fungicides used.
(Nakashibetsu, 1965)

Field No.	Fungicide	Element (per 10a)	Oct. 1				
			Roted root	Degree of injury	Root weight (per 10a)	Die out stand	Blix
		%	%		kg	%	
1	DAPA 4% PCNB 5%	0.4 1.0	4.5	0.8	1256	0	18.3
2	DAPA 4% PCNB 5%	0.4 1.5	11.5	2.6	1428	0	18.6
3	DAPA 4% PCNB 5%	0.4 0.5	14.8	4.9	1303	1.7	18.6
4	PCNB 20%	4.0	1.9	1.1	103	18.1	17.4
5	PCNB 5%	1.0	6.8	2.3	775	7.4	18.7
6	TPTA 20%	1.0	3.8	1.5	735	6.7	17.2
7	No treatment	-	9.3	4.2	859	19.5	16.7
L. S. D. (0.05)			7.6	3.0	253	5.8	1.5

Note: 1) The fungicide is mixed in sowing ditch soil before sowing (May 19), and PCNB dust at No.1, 2 and 5 are sprayed on surface soil on early July.
 2) The variety of sugar beet is KW-E, by direct sowing culture.
 3) The field is designed with randomized 3 repetition, one plot is 22 m².

Attached list 16. Effects on control of root rot and yield of sugar beet with the fungicides used. (Eniwa, 1965)

Field No.	Fungicide	Element (per 10a)	Oct. 6		
			Roted root	Degree of injury	Root weight (per 10a)
		kg	%		kg
1	DAPA 4%+PCNB 10 (5) %	0.2+1.5	2.8	1.4	3750
2	DAPA 4%+PCNB 10 (5) %	0.4+2.0	4.5	1.2	4260
3	DAPA 4%+PCNB 10 (5) %	0.6+2.5	5.9	4.6	3820
4	DAPA 4%+PCNB 10 (5) %	0.4+1.0	5.9	3.6	3770
5	DAPA 4%+PCNB 5%	0.4+1.0	2.9	2.6	4280
6	PCNB 5%	3.0	4.7	3.8	3820
7	No treatment	-	14.4	10.0	3480

Note: 1) The fungicide is mixed in planting ditch soil before planting (May 9), and PCNB 5% dust is sprayed on surface soil on middle July.
 2) The field is loam with volcanic ash and designed with randomized 4 repetition, and one plot is 20m².
 3) The variety of sugar beet is KW-Monopolybeta, by paper pot planting culture with sowing at March 29.

Attached list 17. The same as attached list 16. (Honbetsu, 1965)

Field No.	Fungicide	Element (per 10a)	Harvest time			
			Roted root	Root weight (/10a)	Sugar (per 10a)	Sugar content in root
		kg	%	kg	kg	%
1	PCNB 10%	2.0	0.1	3654	670	17.5
2	DAPA 4%	0.8	0.1	3901	610	17.6
3	DAPA 4%+PCNB 10%	0.8+2.0	0.2	3615	564	17.8
4	PCNB 10%	4.0	0.1	3642	550	17.2
5	DAPA 4%	1.6	0.1	3768	585	17.6
6	DAPA 4%+PCNB 10%	1.6+4.0	0.0	3737	560	17.1
7	DAPA 4%+PCNB 10 (5) %	0.8+3.0	0.0	3568	560	17.7
8	DAPA 4%+PCNB 10 (5) %	0.4+2.0	0.1	3732	584	17.6
9	PCNB 5%	2.0	0.1	3581	551	17.5
10	No treatment	-	0.2	3594	553	17.4
L. S. D. (0.05)			-	N. S.	N. S.	-

Note: 1) The fungicide is mixed in sowing ditch soil before sowing, and PCNB 5% dusts of No. 4~9 are sprayed on surface soil at July 29.
 2) The field is designed with randomized 4 repetition, one plot is 20m² and was cultured corn in last year.
 3) The variety of sugar beet is KW-E, by direct sowing culture.

Attached list 18. Effects on control of root rot and yield of sugar beet with the fungicides used. (Engaru, 1965)

Field No.	Fungicide	Element (per 10a)	Sept. 1		Oct. 11		
			Infection	Degree of injury	Root weight (/10a)	Sugar (/10a)	Sugar content in root
		kg	%		kg	kg	%
1	PCNB 20%	2.0	32.0	8.0	3696	528	17.2
2	PCNB 20%	4.0	23.3	6.3	3611	529	17.4
3	DAPA 4%+PCNB 10%	0.4+1.0	21.7	5.5	3657	530	17.3
4	PCNB 20%	1.0	32.3	8.5	3843	562	17.3
5	PCNB 20%	2.0	25.7	7.0	3681	539	17.4
6	PCNB 20%	4.0	21.0	5.5	3464	509	17.4
7	PCNB 20%	2.0	27.7	7.0	3661	550	17.6
8	PCNB 20%	4.0	20.3	5.3	3580	523	17.4
9	PCNB 20%	8.0	30.3	7.5	3507	504	17.2
10	DAPA 4%+PCNB 20 (10) %	0.4+2.0	20.7	5.3	3522	517	17.4
11	No treatment	-	34.0	9.8	3650	526	17.1
L. S. D. (0.05)			9.0	2.5	N. S.	N. S.	N. S.

Note: 1) The fungicides at No.1~3 are mixed in sowing ditch soil before sowing, they at No.7~9 are sprayed on the surface soil at early and late July, one at No.10 is mixed before sowing and sprayed at early July.

2) The field is designed with randomized 6 repetition, one plot is 10m².

3) The variety of sugar beet is AJ-Poly 1, by direct sowing culture with sowing at May 5.

Attached list 19. The same as attached list 18. (Kimobetsu, 1965)

Field No.	Fungicide	Element (per 10a)	Nov. 16		
			Rotated root	Degree of injury	Root weight (per 10a)
		kg	%		kg
1	DAPA 4%+PCNB 10 (5) %	0.2+1.5	20.6	4.4	3180
2	DAPA 4%+PCNB 10 (5) %	0.4+2.0	22.0	5.8	2970
3	DAPA 4%+PCNB 10 (5) %	0.6+2.5	24.3	5.2	2970
4	DAPA 4%+PCNB 10%	0.2+1.0	31.5	8.6	2940
5	DAPA 4%+PCNB 5%	0.4+1.0	45.1	16.2	3360
6	PCNB 5%	3.0	24.6	7.2	3350
7	DBCP 20%	2.4	57.3	20.0	2750
8	TMTD 50%	30.0	33.1	10.0	3210
9	CaO 100%	12.0	40.7	10.8	3090
10	CaCO 100%	12.0	48.6	14.2	3180
11	No treatment	-	46.8	15.2	3090
L. S. D. (0.05)			19.3	8.6	N. S.

Note: 1) The fungicides of No.1~5 are mixed in sowing ditch soil before sowing, but PCNB 5% dust and they of No.6~10 are sprayed on the surface soil at middle July.

2) The field is designed with randomized 4 repetition, one plot is 24m².

3) The variety of sugar beet is Tsukisappu, by direct sowing culture with sowing at April 27.

Attached list 20. Effects on control of root rot and yield of sugar beet with the fungicides used. (Rokunohe in Aomori pref. 1965)

Field No.	Fungicide	Element (per 10a)	Oct. 23				
			Roted root	Degree of injury	Root weight (/10a)	Sugar content in root	Sugar (/10a)
		kg	%		kg	%	kg
1	DAPA 4%+PCNB 10 (5) %	0.4+2.0	0.9	3.0	3768	17.3	573
2	DAPA 4%+PCNB 10 (5) %	0.8+3.0	3.0	12.2	3618	17.7	572
3	DAPA 4%+PCNB 10 (5) %	1.2+4.0	2.1	8.6	3795	17.4	589
4	DAPA 4%+PCNB 10%	0.8+2.0	2.6	10.2	3627	17.7	582
5	DAPA 4%+PCNB 5%	0.4+1.0	2.7	10.8	3927	18.0	636
6	PCNB 5%	3.0	8.3	22.5	3859	18.1	622
7	No treatment	-	0.5	1.8	3864	17.9	624
L. S. D. (0.05)			N. S.	N. S.	N. S.	-	-

Note: 1) The fungicides of No.1~5 except PCNB 5% are mixed in sowing ditch soil before sowing, but PCNB 5% dust is sprayed on surface soil at early July.

2) The field is designed randomized 4 repetition, one plot is 20m².

3) The variety of sugar beet is Donyu No.2, by direct sowing culture at April 23 sowing.

Attached list 21. The same as attached list 20. (Shikaoi, 1966)

Field No.	Fungicide	Element (per 10a)	Oct. 25		
			Roted root	Degree of injury	Root weight (per 10a)
		kg	%		kg
1	DAPA 4%+PCNB 10 (5) %	0.2+1.5	21.7	13.0	2400
2	DAPA 4%+PCNB 10 (5) %	0.4+2.0	17.4	10.0	2500
3	DAPA 4%+PCNB 10 (5) %	0.6+2.5	24.3	10.0	2000
4	DAPA 4%+PCNB 10%	0.4+1.0	23.7	14.0	2100
5	DAPA 3.3%+PCNB 10 (5) %	0.3+2.0	22.2	14.0	2090
6	DAPA 4%+PCNB 10 (5) %	0.4+1.0	31.9	15.0	2280
7	PCNB 5%	1.0	21.5	13.6	2100
8	No treatment	-	44.7	29.8	2080
9	DAPA 4%	4 g	26.1	18.0	1370
10	PCNB 5%	750	50.0	29.0	1780
11	DAPA 4%+PCNB 5%	4+500	37.8	21.8	1470
12	DAPA 4%+PCNB 5%	4+750	27.7	15.4	1890
13	DAPA 4%+PCNB 5%	4+1000	24.7	12.6	1930
L. S. D. (0.05)			N. S.	N. S.	N. S.

Note: 1) The fungicides of No.1~7 except PCNB 5% are mixed in sowing ditch soil before sowing, DAPA 4% dust of No.9~13 coated on seeds with 5% per weight. PCNB 5% dust is sprayed on surface soil at middle July.

2) The field is designed randomized 4 repetition, one plot is 16 m².

3) The variety of sugar beet is Polyrave, by direct sowing culture at May 9.

Attached list 22. Effects on control of root rot and yield of sugar beet with the fungicides used. (Eniwa, 1966)

Field No.	Fungicide	Element (per 10a)	Oct. 4		
			Roted root	Degree of injury	Root weight (per 10a)
		kg	%		kg
1	DAPA 4%+PCNB 10 (5) %	0.2+1.5	3.3	1.8	3930
2	DAPA 4%+PCNB 10 (5) %	0.4+2.0	6.4	3.0	3708
3	DAPA 4%+PCNB 10 (5) %	0.6+2.5	8.5	3.8	3643
4	DAPA 4%+PCNB 5%	0.4+1.0	15.7	5.8	3563
5	DAPA 4%+PCNB 5%	0.4+1.0	3.2	1.2	3815
6	PCNB 5%	3.0	14.2	6.6	3598
7	No treatment	-	13.9	6.4	3783

Note: 1) The fungicides except PCNB 5% are mixed in planting ditch soil before planting, but PCNB 5% dust is sprayed on surface soil at early Aug.
 2) The field is designed landomized 4 repetation, one plot is 20m².
 3) The variety of sugar beet is KWS-Monopolybeta, by paper pot planting at May 4.

Attached list 23. The same as attached list 22. (Honbetsu, 1966).

Field No.	Fungicide	Element (per 10a)	Oct. 12				
			Roted root	Degree of injury	Root weight (/10a)	Sugar content in root	Sugar (per 10a)
		kg	%		kg	%	kg
1	DAPA 4%+PCNB 10 (5) %	0.2+1.5	5.1	1.6	2733	14.3	291
2	DAPA 4%+PCNB 10 (5) %	0.4+2.0	5.3	1.4	2578	14.0	265
3	DAPA 4%+PCNB 10 (5) %	0.6+2.5	3.1	1.8	2508	14.2	273
4	DAPA 4%+PCNB 10%	0.4+1.0	8.7	7.4	2573	14.2	261
5	DAPA 4%+PCNB 5%	0.4+1.0	4.0	4.2	2856	14.4	313
6	PCNB 5%	3.0	9.5	2.6	2740	14.3	271
7	DAPA 4%	0.4	8.1	7.6	2604	14.2	270
8	PCNB 10%	1.0	15.5	12.6	2469	13.8	240
9	PCNB 10 (5) %	2.0	7.4	2.2	2461	13.9	243
10	No treatment	-	15.4	7.8	2729	13.9	258
L. S. D. (0.05)			-	6.6	-	N. S.	39

Note: 1) The fungicides except PCNB 5% are mixed in sowing ditch before sowing, but PCNB 5% dust is sprayed on surface soil at late July.
 2) The field is designed landomized 4 repetation, one plot is 20m².
 3) The variety of sugar beet is KWS-E, by direct sowing at May 17.

Attached list 24. Effects on control of root rot and yield of sugar beet with the fungicides used. (Engalu, 1966)

Field No.	Fungicide	Element (per 10a)	Oct. 24			
			Roted root	Degree of injury	Root weight (/10a)	Sugar content in root
		kg	%		kg	%
1	DAPA 4%+PCNB 10 (5) %	0.2+1.5	55.6	33.6	982	15.8
2	DAPA 4%+PCNB 10 (5) %	0.4+2.0	45.0	33.6	973	15.9
3	DAPA 4%+PCNB 10 (5) %	0.6+2.5	61.5	33.2	809	15.9
4	DAPA 4%+PCNB 10%	0.4+1.0	62.7	39.4	810	15.8
5	DAPA 4%+PCNB 5%	0.4+1.0	62.3	44.6	676	16.1
6	PCNB 5%	3.0	73.7	48.0	570	15.7
7	No treatment	-	79.4	60.6	388	15.4

Note: 1) The fungicides except PCNB 5% are mixed in sowing ditch soil before sowing, but PCNB 5% dust is sprayed on surface soil at middle July.
 2) The field is designed randomized 4 repetition, one plot is 20m².
 3) The variety of sugar beet is S-10, by direct sowing at May 6.
 4) The growth of sugar beet is injured by many rainfall in August and bad drainage of field.

Attached list 25. The same as attached list 24. (Kimobetsu, 1966)

Field No.	Fungicide	Element (per 10a)	Oct. 22				
			Roted root	Degree of injury	Root weight (/10a)	Sugar content in root	Pure sugar
		kg	%		kg	%	%
1	DAPA 4%+PCNB 10 (5) %	0.4+2.0	20.7	29.5	2422	16.1	88.4
2	DAPA 4%+PCNB 10%	0.4+1.0	22.4	37.1	2251	15.9	88.8
3	DAPA 4%+PCNB 5%	0.4+1.0	18.7	30.0	2363	16.3	89.9
4	PCNB 5%	3.0	47.1	54.7	2520	16.6	89.8
5	No treatment (direct sowing)	-	45.5	61.5	2305	16.1	89.1
6	DAPA 4%+PCNB 10 (5) %	0.4+2.0	33.7	64.0	2587	14.4	90.2
7	DAPA 4%+PCNB 10%	0.4+1.0	36.1	67.3	2590	14.5	90.2
8	DAPA 4%+PCNB 5%	0.4+1.0	39.4	75.0	2471	15.1	90.5
9	PCNB 5%	3.0	38.8	64.3	2589	15.8	90.8
10	No treatment (paper pot planting)	-	40.4	65.5	2708	15.4	90.3
L. S. D. (0.05)			N. S.	12.2	N. S.	0.3	0.5

Note: 1) The fungicides except PCNB 5% are mixed in sowing or planting ditch soil, but PCNB 5% dust is sprayed on surface soil at early August.
 2) The field is designed split plot 4 repetition, one plot is 27m².
 3) The variety of sugar beet is Tsukisappu, by paper pot planting at May 12.

Attached list 26. Effects on control of root rot and yield of sugar beet with the fungicides used. (Rokunohe in Aomori Pref. 1966)

Field No.	Fungicide	Element (/10a)	Nov. 12				
			Roted root	Degree of injury	Root weight (/10a)	Sugar content in root	Sugar (/10a)
		kg	%		kg	%	kg
1	DAPA 4%+PCNB 10 (5) %	0.2+1.5	29.8	15.0	2087	12.6	214
2	DAPA 4%+PCNB 10 (5) %	0.4+2.0	37.3	18.6	2043	13.1	223
3	DAPA 4%+PCNB 10 (5) %	0.6+2.5	26.9	12.4	2009	12.7	210
4	DAPA 4%+PCNB 10%	0.4+1.0	34.5	18.8	2014	12.8	210
5	DAPA 4%+PCNB 5%	0.4+1.0	41.0	20.3	1748	12.9	184
6	PCNB 5%	3.0	32.3	21.6	2134	12.5	219
7	No treatment	-	33.2	18.4	2043	12.5	207
L. S. D. (0.05)			N. S.	N. S.	N. S.	N. S.	N. S.

Note: 1) The fungicides except PCNB 5% are mixed in planting ditch soil before planting, but PCNB 5% dust is sprayed on surface soil at early July.

2) The field is designed with randomized 4 repetition, one plot is 20m².

3) The variety of sugar beet is Dounyu No.2, by paper pot planting at May 11.

Attached list 27. The same as attached list 26. (Shikaoi, 1967)

Field No.	Fungicide	Element (/10a)	Oct. 11		
			Roted root	Degree of injury	Root weight (/10a)
		g	%		kg
1	PCNB 5%	1500	3.8	1.4	2530
2	DAPA 70%	1.4	2.5	1.0	3030
3	MHO 50%	1.0	6.9	4.4	2800
4	DAPA 70%+PCNB 5%	1.4+1500	2.8	1.2	2820
5	DAPA 4%+PCNB 5%	1.4+1750	3.3	0.8	2820
6	No treatment	-	7.5	5.2	2850
L. S. D. (0.05)			N. S.	N. S.	N. S.

Note: 1) In the fungicides, they except PCNB 5% of No.2~4 coated on seeds 1% per seed weight and it of No.5 is mixed in sowing ditch soil before sowing. PCNB 5% dust of No.1,4 and 5 sprayed on surface soil at middle July.

2) The field is designed randomized 6 repetition, one plot is 40m².

3) The variety of sugar beet is Polyrave, by direct sowing at April 27.

Attached list 28. The same as attached list 26. (Eniwa, 1967)

Field No.	Fungicide	Element (/10a)	Roted root	Degree of injury	Root weight (/10a)
		g	%		kg
1	PCNB 5%	1500	19.0	10.4	2900
2	DAPA 70%	1.4	25.9	15.6	3000
3	MHO 50%	1.0	21.4	11.0	3160
4	DAPA 70%+PCNB 5%	1.4+1500	21.9	12.2	2960
5	DAPA 4%+PCNB 5%	1.4+1750	15.8	8.2	2960
6	No treatment	-	26.0	14.2	2900
L. S. D. (0.05)			8.7	N. S.	N. S.

Note: 1) The treatment method of fungicides is same as that of attached list 27.

2) The field is designed with randomized 8 repetition, one plot is 40m².

3) The variety of sugar beet is Polybeta, by direct sowing at April 24.

Attached list 29. Difference of black scurf symptoms between be used seed tuber with severe and minor sclerotia. (on early growth stage of potato)

Stage	Matters for checkup	Severe sclerotia plot	Minor sclerotia plot
15 days after planting (June 1)	No. of germ	5.3	4.5
	No. of abnormal germ	2.3	2.1
	Degree of infection	46.7	26.7
	Degree of sclerotia on seed tuber	62.2	31.1
	Isolate from lesion on germ		
	Rhizoctonia	6/20 *	0/4
	Fusarium	5/20	1/4
28 days after planting (June 14)	Bacteria	8/20	3/4
	Sterile	1/20	0/4
	No. of germ	8.4	3.8
46 days after planting (July 1)	No. of abnormal germ	4.0	2.5
	Degree of infection	56.7	50.0
	No. of stem	3.9	2.5
	Stem with hypha on ground level part	84.6 %	0 %
	Stem with browning or hollow on ground level part	17.9 %	80.0 %
	Under ground germ	1.1	0.7
	Infection of under ground germ	100 %	85.7 %

Note: 1) The figures in list showed with average of 15 plants.

2) The degree of infection and sclerotia is calculated with follow expression and index Nos. are 0, 1, 2 and 3.

$$\frac{\sum(\text{No. of plants in every class} \times \text{Proper indexes})}{\text{No. of total plants} \times \text{Maximum index}} \times 100$$

3) * is strain corresponded/No. of tissues isolated.

Attached list 30. The same as attached list 29.
(on middle growth stage of potato)

Stage	Matters for checkup	Severe sclerotia plot			Minor sclerotia plot
		Plants show symptom	Symptom less plants	Average	
61 days after planting (July 16)	No. of stolon	9.3	20.3	14.8	10.2
	Browned stlon	73.8 %	78.6 %	76.2 %	33.3 %
	No. of young tuber	2.0	4.0	3.0	2.4
	Degree of infection (per stem)	4.7	8.0	6.4	2.8
	Stolon : Fusarium 1/6, Penicillium 1/6, Bacteria 4/6				
	Young tuber : Fusarium 5/8, Alternaria 1/8, Sterile 1/8				
	Root : Rhizoctonia 2/8, Fusar. 2/8, Macrosporium 1/8 Sterile 1/8, Bact. 2/8				
77 days after planting (August 1)	No. of stolon	23.7	22.5	23.1	15.8
	Browned stlon	64.8 %	66.7 %	65.8 %	45.6 %
	No. of young tuber	11.0	11.0	11.0	7.8
	Degree of infection (per stem)	81.8	31.8	56.8	15.4
	Stolon : Fusarium 8/11, Penicillium 1/11, Bacteria 2/11				
	Young tuber : Fusarium 6/12, Bacteria 6/12				
	sclerotia on tuber : Rhizoctonia 6/12, Fusarium 2/12, Bacteria 4/12				
93 days after planting (August 17)	No. of stolon			24.3	18.0
	Browned stlon			57.7 %	33.3 %
	No. of young tuber			11.5	9.3
	Browned tuber			34.8 %	5.4 %
	Bottom of stem : Fusarium 6/7, Bacteria 1/7				
	Stolon : Fusarium 9/15, Bacteria 3/15, Sterile 3/15				
	Young tuber : Fusarium 1/5, Penicillium 1/5, Bact. 1/5, Sterile 1/5				
	Root : Fusarium 2/3, Bacteria 1/3				

Note: 1) The figures in list showed with average of 5 plants.

2) Look at the note of the attached list 29 about other checkup.

Attached list 31. The same as attached list 29.
(on late growth stage of potato)

Stage	Matters for checkup	Severe sclerotia plot	Minor sclerotia plot
110 days after planting (Sept. 3)	No. of stolon	27.5	11.8
	Browned stolon	84.5 %	40.4 %
	No. of young tuber	19.3	8.0
	Browned tuber	46.8 %	18.8 %
	Weight of new tuber	825.0 g	750.0 g
	Isolate from lesion	Bottom of stem : Fusarium 5/6, Bacteria 1/6	
		Stolon : Fusarium 12/15, Bacteria 1/15, Sterile 1/15	
		Young tuber : Fusarium 5/10, Bacteria 2/10, Sterile 3/10	
124 days after planting (Sept. 17)	No. of stolon	25.5	13.0
	Browned stolon	82.4 %	65.4 %
	No. of young tuber	16.5	7.8
	Sclerotia formed tuber	81.8 %	22.6 %
	Degree of sclerotia	9.5	2.4
	Weight of new tuber	737.5 g	612.5 g
	Size of yielded tuber	Big 3.8 % 15.2 %	
		Middle 10.5 % 39.4 %	
		Small 21.9 % 15.2 %	
		Too small 63.8 % 30.3 %	
149 days after planting (Oct. 12)	Isolate from lesion	Bottom of stem : Fusarium 4/17, Sterile 3/7	
		Stolon : Fusarium 4/13, Bacteria 4/13, Sterile 5/13	
		Young tuber : Fusarium 3/6, Sterile 3/6	
	Total of tuber weight	658.9 g	696.3 g
	No. of total tuber	12.5	8.5
	Weight of good tuber	609.9 g	680.5 g
	No. of good tuber	7.3	6.4
	Weight of too small tuber	49.0 g	15.8 g
	No. of too small tuber	5.1	2.1
	Degree of sclerotia	38.2	6.6

Note: 1) The figures in list showed with average of 5 plants.

2) At size of tuber, big is over 120g, middle is 70~120g, small is 30~70g, too small is under 30g.

3) The commercial tuber is that small~big in size and 1 or 0 of sclerotia index.

Attached list 32. Suppressive effect for black scurf of potato by the fungicides in field. (test 1)

Field No.	Fungicide	Element (/10a)	Total tuber (/10a)	No. of tuber (/10a)	Too small tuber	Tuber with sclerotia	Good tuber (/10a)	Commercial yield ^{*)}
		kg	kg	×100	%	%	kg	%
1	PCNB 20%	9	1415	252	32.6	9.1	1255	99.7
2	PCNB 20%	6	1550	268	34.1	14.6	1350	98.4
3	PCNB 20%	3	1530	252	33.5	27.0	1245	92.6
4	PCNB 20%	6	1510	272	36.4	20.0	1265	96.0
5	PCNB 20%	4	1660	272	35.1	25.0	1345	91.6
6	PCNB 20%	2	1650	260	27.7	24.0	1420	95.6
7	TCNB 20%	6	1550	230	31.2	39.1	1300	90.0
8	TCNB 20%	4	1580	251	31.6	43.8	1250	86.2
9	TCNB 20%	2	1780	272	29.5	38.3	1480	89.5
10	EMP 0.5% (Hg 0.3%) 0.45		1740	282	34.3	36.8	1335	84.5
11	No treatment	-	1740	317	35.3	72.0	955	63.0
L. S. D. (0.05)			N. S.	-	N. S.	20.8	N. S.	8.4

Note: 1) The fungicides of No.1~3 are mixed in surface soil of plot, and that of No.4~10 are mixed in planting ditch soil before planting.

2) *) = weight of good tuber / weight of total tuber.

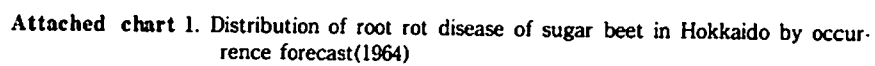
Attached list 33. The same as attached list 32. (test 2)

Variety	Fungicide	Element (/10a)	Total tuber (/10a)	No. of tuber (/10a)	Too small tuber	Tuber with sclerotia	Good tuber (/10a)	Commercial yield
		kg	kg	×100	%	%	kg	%
Hokkai No. 16	PCNB 20%	4	2230	290	20.3	27.3	1890	86.2
	TCNB 20%	4	2030	252	18.7	59.6	1380	68.3
	No treatment	-	2290	306	23.5	65.1	1475	65.3
	L. S. D. (0.05)		-	-	N. S.	22.0	N. S.	17.3
Ohojiro	PCNB 20%	4	1250	268	28.7	12.8	1160	99.6
	TCNB 20%	4	1330	233	25.9	29.6	1230	95.5
	No treatment	-	1580	288	28.2	32.0	1425	95.3
	L. S. D. (0.05)		-	-	-	12.2	N. S.	-

Attached list 34. The same as attached list 32. (test 3)

Sterilization of seed tuber	Fungicide	Element (/10a)	Total tuber (/10a)	No. of tuber (/10a)	Tco small tuber	Tuber with sclerotia	Good tuber (/10a)	Commercial yield
		kg	kg	×100	%	%	kg	%
No try	PCNB 20%	4	2830	337	15.5	11.5	2640	95.0
No try	No treatment	-	2950	299	12.8	39.2	2240	77.0
Try	PCNB 20%	2	2880	294	10.6	10.7	2640	92.9
Try	PCNB 20%	4	2830	303	9.9	14.0	2560	91.8
Try	PCNB 20%	6	2690	288	12.6	12.9	2520	93.4
Try	No treatment	-	2760	287	13.3	39.9	2120	76.0
L. S. D. (0.05)			-	-	-	-	281	-

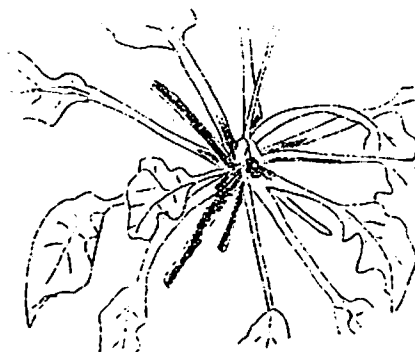
Note: The sterilization of seed tuber is sinking 20 minutes in diluted 1000 times bichloride of mercury, and then the tuber is dried after washed with water.



Attached chart 1. Distribution of root rot disease of sugar beet in Hokkaido by occurrence forecast(1964)



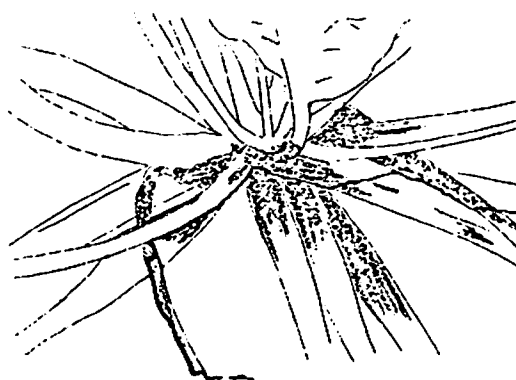
1) No infection (index 0)



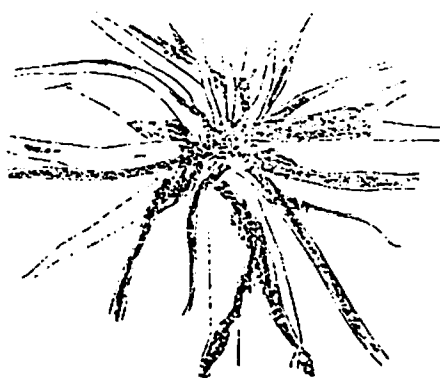
2) Infection of only basic part of petiole (index 1)



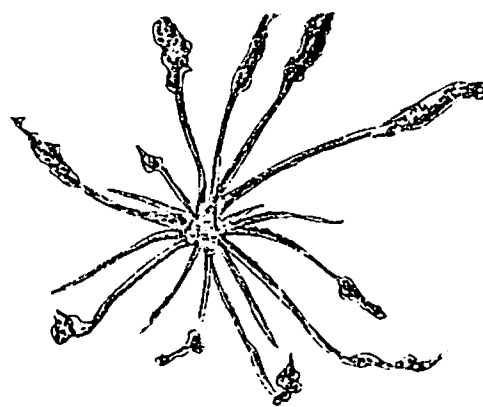
3) A little expanse of infection on petiole (index 1)



4) Big expanse of infection on petiole (index 3)



5) Several leaves are killed by infection (index 5)

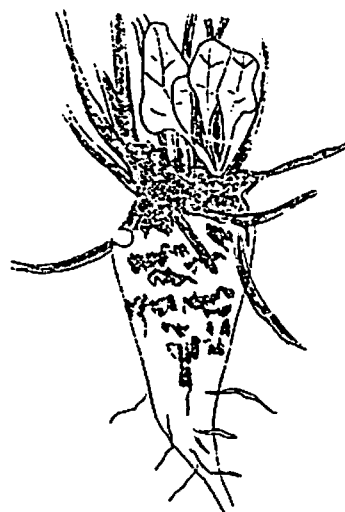


6) All leaves are killed by infection (index 5)

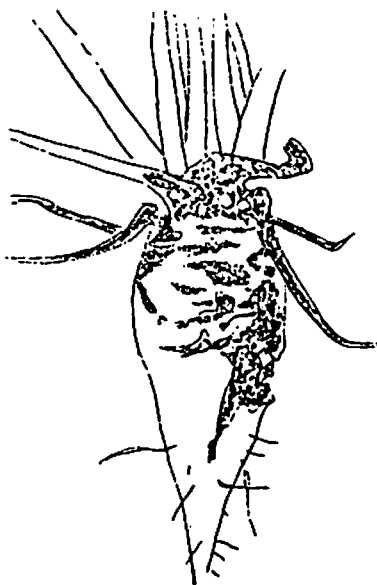
Attached chart 2. The model of observation about infection on sugar beet. (in growth stage)



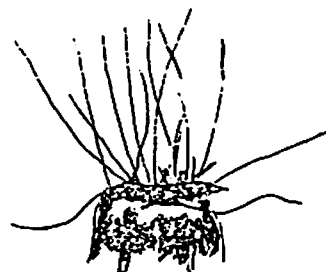
1) No root rot (index 0)



2) Minor root rot (index 1)



3) Severe root rot (index 3)



4) Complete root rot (index 5)

Attached chart 3. The model of observation about root rot of sugar beet. (on harvest time)