## The Survey of the Plant Parasitic Nematodes, Distributed in the Fields of the Export Plant and the Seed Potato.

 Classification of the main plant parastitic nematodes separated from sampling soil.

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A preliminary survey was complished by the Baermann funnel method throughout the sampling soil of 357 fields which grown export plant and seed potato in Japan in 1958. It was indicated that 223 fields out of 357 fields were infested with the plant parasitic nematodes, and at least 16 genera of parasitic nematodes inhabited.

The root-knot nematodes showed the widest distribution of all the 16 genera discovered, and the root-knot nematodes were found at 74 fields surveyed.

Likewise, it was a kind of Spiral nematode (Rotylenchus robustus Filipjev) undiscribed in Japan 55 fields, Dorylaimus spp. (contained possible plant parasitic nematodes) 44 fields, Root lesion nematodes (pratylenchus spp.) 39 fields, Cyst nematodes (Heterodera spp.) 23 fields, several species of True spiral nematode (Helicotylenchus muticinctus Golden and Helicotylenchus spp.) 34 fields, and Reniform nematode (Rotylenchulus reniformis Linford & Oliveira) 9 fields.

The results of this survey indicated that the ectoparasitic nematodes, especially, out of the plant pasasitic nematodes, are more widely distributed and are causing considerably more damage than previously believed.

					Species													
Prefecture & field No.		Plants (Summer season)  1956 1957 1958				Tetylenchus spp.	Ditylenchus dipsaci	Hoplolaimus sp.	Helicotylenchus spp.	Helicotylenchus multicinctus	Rotylenchus robustus	Pratylenchus spp.	Heterodera spp. Rotylenchulus reniformis	Meloidogyne spp.	Criconemoides spp.	Aphelenchoides bessei Tylenchulus semi-penetrans	Dorylaimus spp.	Miscellaneous
Hokkaido	1	cabbage	potato	tulip	-				-			++	+			w 2. w.		
"	2	onion	onion	lily					ļ			711						#
"	3	dahlia	dahlia	dahlia										##				#
Fukushim	a 1	potato	lily	lily					1				1	+			+	##
"	2		rice	red pine	ĺ				l		+		+	•			·	##
"	3	cucumber	cucumber	gladiolus							•		l '				+	##
"	4	_	gladiolus	"										##			+	##
Ibaragi	1	sweet potato	sweet potato	lily									ļ				+	##
"	2	rice	lily	"								+	++				+	##
"	3	sesame	kochia scoparia	gladiolus								+		##	+			##
"	4	rice	eggplant	"										##		}		##
"	5	_	tobacco	"										##				##
"	6	tobacco	sweet potato	"									++	#	+			##
"	7	sweet potato	rice	"					ĺ									##
"	8	_		"								+		+			+	##
"	9		-	"										##				##-
"	10		_	"									#	++		1		##
n	11			"											+			##
"	12	_	_	"														##
Tochigi	1	tobacco	sweet potato	lily												+		##
"	2	welsh onion	yam	"	i									#				##
"	3	taro	legenaria	gladiolus										##				##
"	4	rice	pumpkin	"														+
"	5	"	gladiolus	"										##				##

					L						pecie							
Prefectu & field I		1956	Plants (Summer season)  1956 1957 1958					Hoplolaimus sp.	Helicotylenchus multicinctus Helicotylenchus spp.	Pratylenchus spp.	Rotylenchulus reniformis	Heterodera spp.	Meloidogyne spp.	Criconemoides spp.	Tylenchulus semi-penetrans	Aphelenchoides bessei	Aphelenchoides ritzema-bosi	Dorylaimus spp.
Gunma	1	rice	taro	lily	1.5						2.			_	5	22.	₩.	
"	2	soy bean	soy bean	"					]									+
"	3	eggplant	cucumber	"														+
."	4	sweet potato	eggplant	gladiolus					1		-		##				+	
Saitama #	2	rice lily	hollyhock cucumber	lily									#					
"	3	sweet potato	sweet potato	"														+
"	4	"	rice	"													+	
"	5	rice	sweet potato	gladiolus					-			+	##		1		'	+
"	6	"	carrot	"									##					+
"	7	_	dahlia	dahlia						++								
" Chiba	8	lilu.		"														÷
m.	2	lily .	ginger //	// tomato									+			#		
"	3	peanut	peanut	lily									+					
"	4	"	taro	"							+	+	•					
"	5	_	radish	gladiolus					+	ŀ			++					
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	6	sweet potato	sweet potato	"									##					
Kanagawa	1 2	rice //	",	lily					+	-					ĺ			
"	3	cryptomeria	rice	"	1				l									
"	4	"	"	",					}		1	##			ĺ			+
"	5	rice	sweet potato	"								+						+
Niigata	1	watermelon	tulip	tulip					+							+		
"	2	"	"	"												+		
"	3	rape "	tobacco	iris														
".	4 5	tulip	",	tobacco									+					
"	6	// <sup>4</sup>	,,,	//						+			#		+			
"	7		tulip	tulip						7		+			+			+
"	8	-	potato	potato									+		'			
"	9	-	sweet potato	tulip														
"	10	potato	iris	iris								##						
Niigata	11	_	potato	potato	1											+		+
"	12		<i>"</i>	//							ŀ		+					
"	13 14	sweet pea	zinnia "	tulip tulip														
	15	watermelon	tobacco	iris									+					
	16	"	"	"							1							+
"	17	rape	sweet potato	tobacco														
"	18	"	"	"	ŀ													
"	19	tulip	lily	iris														
	20 21	tree peony	herbaceous peony hyacinth	tomato . tulip					+									
	22	lily	tomato	iris					· ·									
"	23	sweet potato	potato	tulip														
"	24	eggplant	"	<b>"</b> ·														
	25	clover	sweet' potato	lily														
"	26	watermelon	tomato	, ",														
"	27 28	soy bean potato	soy bean sweet potato	gladiolus "						+			##					
"	29	watermelon	tobacco	",									##					
"	30	pumpkin	tomato	"						+								
`oyama	1	rice	rice	tulip									+					
"	2 .	"	"	potato														
"	3	"	"	tomato, eggplant														
"	4 5	"	",	tulip "														
"	6	tulip	eggplant,	",						+			+					+
"	7	sweet potato	watermelon eggplant, tulip	sweet potato									•			+		+
"	8	rice	watermelon	potato														
"	9	_	chinese milk vetch	rice														
"	10	_	rice	tulip									+					
"	11 12	rice	"	potato														
"	13	<u> </u>	",	tulip potato	1													

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Prefectu & field M			Plants (Summer seaso	n)	Tylenchorhynchus sp.	Tetylenchus spp.	Ditylenchus dipsaci	Hoplolaimus sp.	Helicotylenchus spp.	Helicotylenchus multicinctus	Rotylenchus robustus	Pratylenchus spp.	Rotylenchulus renifo	Meloidogyne spp.	Criconemoides spp.	Miscellaneous  Dorylaimus spp. Aphelenchoides ritzema-bosi Aphelenchoides bessei Aphelenchulus Tylenchulus semi-penetrans
		1956	1957	1958	ıs sp.		acı		spp.	ictus	stus		rmis	٠	Ď.	-bosi essei
Toyama	14	rice	rice	tulip												##
Yamanash "	2	_	lily —	lily —						#	#					##
"	3															+ #
Nagano "	1 2	• chrysanthemum	gladiolus chrysanthemum	chrysanthemum herbaceous peony				+								+ #
. "	3	mulberry	radish	carrot				#					+			+ ##
"	4 5	radish tomato	soy bean dicentar spectabilis	lily				#			+					##
"	6		chinese bellflower	chinese bellflower												##
"	7 8	potato rice	carrot soy bean	lily gladiolus							+					##
"	9	eggplant	watermelon	giadioius //												111
"	10	rice	rice	"												#
"	11 12	soy bean	soy bean	",							+					+ ##
"	13		-	,,					ļ	+	#	#				+ ##
Gifu	1	sweet potato	sweet potato	"								+		#		##
" Shizuoka	2 1	"	lily	lily						+	+	#	+			"
"	2	"	sweet potato	"						+						##
"	3 4		tobacco peanut	gladiolus						+						. ##
"	5	sweet potato	rice	"										-		"
Aichi	1	mulberry	watermelon	"												#
"	2	forest	forest sweet potato	",							#	+				##
"	4	sweet potato	"	"							••			H		##
"	5 6		"	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,												##
"	7	rice sweet potato	rice cabbage	rice gladiolus										+		+ #
"	8	"	potato	"												#
" Aichi	9 10	fallow	spinach sweet potato	gladiolus												+
//	11	ianow —	cabbage	giadioius "						+	+					
"	12	_	burdeck	"												#
"	13 14	sweet potato	sweet potato	// dahlia						+						++
Mie	1	sweet potato	sweet potato	gladiolus		+			1		+					111
"	2	watermelon	rice	"				í						+		
"	3 4	taro	soy bean taro	"												##
"	5	sweet potato	sweet potato	"							#		ļ	#		+++
"	6 7	corn corn	"	"							#			#	+	##
"	8	sweet potato	"	"												111
"	9	<b>"</b>	rice	"										#		##
"	10 11	corn corn	sweet potato	",	-											##
"	12	tea	tea	"										#		#
"	13 14	sweet potato	sweet potato	"						#	#	ħτ		111		##
"	15	radish	gladiolus	",								##		711		#
″	16	sweet potato	soy bean	"										+		# #
"	17 18	"	sweet potato	",					+		+			##		##
"	19	watermelon	watermelon	"	1				ļ .		·					#
"	20	sweet potato	//	",					,					##		##
"	21 22	<i>"</i>	soy bean	"					+							##
"	23	″,	sweet potato	"												+
"	24 25	soy bean sweet potato	" taro	"										++		##
"	26	soy bean	"	"										11		#
// //	27 28	cábbage	watermelon	"												111
"	28	sweet potato	"	"	1											#

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Prefect & field			Plants (Summer season)					Hoplolaimus sp.	Heiicotylenchus spp.	multicinctus	Rotylenchus robustus	Pratylenchus spp.	Heterodera spp. Rotylenchulus reniformis	Meloidogyne spp.	Criconemoides spp.	Aphelenchoides, bessei Tylenchulus semi-penetrans	Dorylaimus spp. Aphelenchoides	
		1956	1957	1958	Tylenchorhynchus sp.		Ditylenchus dipsaci		ğ	tus	tus		mi:		_	ans	i	
Mie	29	sweet potato	tobacco	gladiolus														
"	30	peanut	sweet potato	"														
"	31 32	lily sweet potato	"	"							+							
",	33	"	",	",							Τ.					j		
"	34	"	tobacco	"									İ	++				
"	35	"	sweet potato	"		+								+				
"	36	. "	"	"									1					
"	37	tobacco	tobacco	"					+		+							
",	38 39	sweet potato tobacco	sweet potato	",		+					+							
"	40	sweet potato	taro	"						+	+		İ					
"	41	,,	sweet potato	"												i		
"	42	"	"	"	-				ļ									
"	43	" ,	watermelon	"					İ									
"	44	watermelon	lily	",												]	+	
"	45 46	sweet potato	sweet potato	",													+	
"	47	mulberry	"	, ,,	1													
"	48	sweet potato	"	"								+		+				
"	49	"	rice	"				+										
"	50	soy bean	sweet potato	"	İ								1					
"	51 52	sweet potato	"	",	1								1	#				
"	53	forest	azuki bean	",							+	#						
"	54	butter bean	tomato	"								"				1		
"	55	sweet potato	sweet potato	"				+										
"	56	"	"	"									ļ					
"	57	"	"	"	İ				ļ									
"	58 59	rice	watermelon	",									1					
"	60	soy bean	sweet potato soy bean	",				+	1				ĺ					
"	61	"	sweet potato	"													+	
Лiе	62	soy bean	sweet potato	gladiolus	1								į				++	
"	63	"	"	"							#					ļ		
"	64	sweet potato	sesame	"								•	į					
"	65	Horse bean	sweet potato	"														
"	66 67	forest soy bean	forest soy bean	",									Í	++				
"	68	soy bean	my bean	",						+	+			#				
"	69	sweet potato	sweet potato	,,,														
"	70	"	soy bean	"					+		+							
"	71	"	sweet potato	"														
"	72	soy bean tobacco	soy bean	",					-		+							
Vyoto	73 1	arum	tobacco gladiolus	,,									1	+		ĺ		
"	2	sweet potato	sweet potato	"									1					
"	3	_	arum	"				+						#				
"	4	cryptomeria	azuki bean	"									1					
"	5	rice	rice	"														
"	6 7	fallow soy bean	fallow	",		.IL			ł		#	- 44						
"	8	sweet potato	soy bean	,,,		#					11	П	l					
"	9	watermelon	rice	"	ŀ								++		+			
Iyogo	1	rice	"	dahlia									1					
"	2	"	"	"														
"	3	<b>"</b>	"	"														
"	4	// forget	" forest	",	1.	+												
"	5 6	forest	iorest //	,,,	+													
"	7	chrysanthemum	rice	"												+		
"	8	coronarium "	radish	"				5				+						
"	9	"	rice	"								##				1		
Varą	1			lily									+			1		
"	2	lily //	lily "	"												1		
.,	0	ı "	1 "	"	1				1				1			1		

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Prefectu & field N			Plants (Summer seas	on)	Tylenchorhynchus sp.	Tetylenchus spp.	Ditylenchus dipsaci	Hoplolaimus sp.	Rotylenchus robustus Helicotylenchus multicinctus Helicotylenchus spp.	_	Heterodera spp Rotylenchulus reni	Meloidogyne spp.	Criconemoides spp.	Aphelenchoides bessei Tylenchulus semi-penetrans	Dorylaimus spp. Aphelenchoides ritzema-bosi	Miscellaneous
		1956	1957	1958	s sp.		ũ.		stuš ctus pp.	٠	formis		P.	ans.	bosi	
Nara	4	watermelon	lily	lily	1							++				##
"	5 6	arum tomato	arum	"					1							##
",	7	lily	gladiolus	,,							İ					##
"	8	sweet potato	lily	"					++						+	##
"	9	butter bean	cucumber	"							+			į		##
"	10	watermelon	spinach	\ ."	1					•	}			1		##
"	11 12	zuki bean	burdock soy bean	dahlia "												##
"	13	"	"	"					+							##
"	14	gladiolus	watermelon	"					İ					1		##
"	15	azuki bean	tobacco	"	1									1		##
"	16	1,1,1;-	soy bean	"							l		+	İ		##
"	17 18	dahlia azuki bean	dadlia azuki bean	"					+	#	++					##
"	19	watermelon	watermelon	"						**						##
"	20	sweet potato	dahlia	"								+			+	##
Tottori	1	"	sweet potato	gladiolus												##
// T-bb'	2	"	watermelon	"								+				##
Tokushim	a 1 2	watermelon	burdock	lily										1	+	#
n	3	mulberry	mulberry	"	1				1						+	##
"	4		potato	"	1									1		##
"	5	_	-	"					ļ					ĺ	+	##
<i>"</i>	6	-	taro	"											+	##
Saga "	1 2	_	_	",							++	+				#
"	3	_	_	"						+	#			1		##
Nagasaki	1		sweet potato	potato					+						+	##
"	2	_	"	"					}						+	##
"	3 4		rice	"		##			++					1		##
"	5	_	sweet potato	"							1	##				#
Nagasaki	6	_	sweet potato	potato								##		1		##
"	7	_	soy bean	"		##			1	+				1		##
"	8	-	mulberry	"					#	+						##
"	9		sweet potato	"					++							##
"	10 11		",	"	1		+			+		##		1	+	#
"	12	_	<u>"</u>	"			т		+	+		ш				π ##
"	13		sweet potato	"	ĺ				+							##
"	14	_	-	"												##
"	15 16	_	_	"	-				+		+	#				##
,,	17	_	_	,,,		++			İ			##				#
"	18	-	_	lily		11				+						##
"	19	-		rape						+						##
"	20	_	potato	carrot					+							##
"	21 22	_		plantain cabbage	1	##			1	++						##
"	23		_	lily		++				т					т	π ₩
"	24		_	"		#				+				ĺ	+	##
"	25	-	-	"					+							##
"	26 27	_	_	//	1				+		١.			l		#
"	28	_	_	mandrine orange lily					1		++			++	+	##
"	29	_		" "					+	++	Ι΄.					##
"	30	_	sweet potato	"					##		+					##
"	31	_	"	"					++		+	+				#
"	32	sweet potato	"	"					#	+	<u> </u>					##
"	34	<i>"</i>	",	",	1					+	+ +					#
"	35	"	"	"												#
"	36	"	"	"	Ì				1	+						##
"	37	<u>"</u>	"	"	1				1	+						##
"	38	-	"	"						•				1		

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					7	7		7	7		, ×		ecies	r 8	- 0	r.	A	<u>.</u>	D	
D. G. town		Pl	ants (Summer season)	)	Tylenchorhynchus sp.	Tetylenchus spp.	Ditylenchus dipsaci	Hoplolaimus sp.	Helicotylenchus spp.	multicinctus multicinctus	Rotylenchus robustus	Pratylenchus spp.	Rotylenchulus reniformis	Metordogyne spp.	Criconemoides spp.	Tylenchulus semi-penetrans	Aphelenchoides bessei	Aphelenchoides ritzema-bosi	Dorylaimus spp.	Miscellaneous
Prefecture & field No	- 1				horh)	ıchus	ichus	aimu	ylenc	mu	ichus	nchu	chuli	gyne terri	moid	ulus emi-f	ichoic	ritz	mus	теои
a nota vi					nchu	spp.	dips	s sp.	hus	lticin	robu	dds s	us us mifor	spp.	es sp	enetr	tes be	tes ema-l	sp <b>p</b> .	s
		1956	1957	1958	s sp.		zci.		pp.	ctus	gtus	•	mis.			ans	ssei.	2005		
-	39	ramie	sweet potato	lily																##
	40	soy bean	soy been	"																₩
	42	-	potato	potato					#	+	++			H						##
	43 44	_	sweet potato	horse bean soy bean					+		#			+						##
	45	- [	-	sweet potato						+								+		##
	46 47	_	_	" chrysanthemum																##
	48	-	sweet potato	sweet potato potato					110											#
	49 50	_	_	potato "					++											##
	51	_	pumpkin	cabbage sweet potato												Ì				##
	52 53	_	sweet potato	"																##
	54	_	"	soy bean																+
	55 56	_	"	rape soy bean					Ì	+										##
	57	— fallow	- fallow	carrot fallow											+  +					++
	58 59	nanow "	nanow "	"											+					##
. "	60	" "	"	"											<b>+</b> ₩					##
"	61 62	"	<i>"</i>	"							+			1	31					##
"	63	" "	"	// //						+										##
"	64 65	"	"	"																#
"	66	"	",	"																+
" Kumamot	67 o 1	sweet potato	sweet poteto	lily						+	ŀ					ŀ				##
"	2	mulberry	mulberry	"					1											#I
"	3	sweet potato tobacco	sweet poteto	<i>",</i>	ĺ					.+										##
Kumamote "/	o 5 6	sweet potato	sweet potato tobacco	lily "	Ì					+					+	1				#
"	7	"	"	 "						Ċ										##
<i>''</i>	8 9	_	corn //	potato //										#						##
"	10		_	<i>"</i>												1				##
Oita "	1 2	string bean	rice watermelon	lily				+			+	+			-1	-				##
"	3		taro	"		+							ļ							##
Miyazaki "	1 2	_	rice	sweet potato													+			##
"	3	-	"	"															#	+11+
"	4 5	_	"	"																##
"	6		"	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,											+					+++
"	7 8	_	"	"													+	•		## ##
"	9		lupine	"											+					414
"	10 11	_	rice —	iris								+					+	-		<del>   </del>
"	12	de de la companya de la companya de la companya de la companya de la companya de la companya de la companya de	rice	potato											+					##
Kagoshim "	a 1	sweet potato	sweet potato	lily "	+						+							+		##
"	3	-	"	"																##
"	4 5	_	"	"							+	ł								# <del> </del>
"	6	_	"	"							+	t						- 4		##
"	7 8	_	"	",	++	+	+				+	+ +							-	41t
"	9	_	"	"														4		##
"	10 11	sweet potato	cucumber sweet potato	"	-							+!								<del>111</del>
"	12	sweet potato	eggplant	,,, "								+				++				##
"	13 14	éggplant	cucumber —	lily sweet potato					+	+	i	t								##
	15	sweet potato	sweet potato	lily							<del>-</del>					++				++

# many, # moderate, + few