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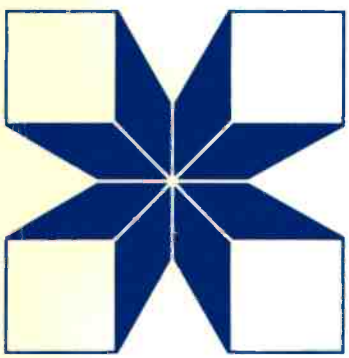

CANADA

OIL CROPS: SESAME AND SUNFLOWER SUBNETWORKS

PROCEEDINGS OF THE JOINT SECOND WORKSHOP HELD IN CAIRO, EGYPT, 9–12 SEPTEMBER 1989

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This series includes meeting documents, internal reports, and preliminary technical documents that may later form the basis of a formal publication. A Manuscript Report is given a small distribution to a highly specialized audience.

La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.

Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.

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OIL CROPS:
SESAME AND SUNFLOWER SUBNETWORKS

Proceedings of the Joint Second Workshop held in Cairo, Egypt, 9–12 September 1989

Edited by
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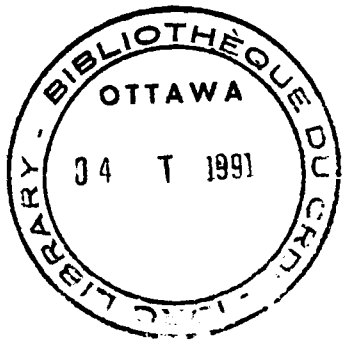

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FOREWORD

In September 1989, the Sunflower and Sesame subnetworks held their bi-annual meetings in Cairo, Egypt. The meetings were well attended and papers, presented in these proceedings, provide a very informative overview of some of the cropping systems, management practices, production constraints and research highlights for both crops in several countries.

Chronic edible oil deficit is a major problem facing many developing countries in Africa and Asia where most countries are forced to import large quantities to satisfy the requirements of their growing populations. With the present rates of population increase and the improvement of nutrition standards it is likely that the consumption of edible oil will rise over the years, increasingly drawing on scarce foreign exchange for the importation of this vital food staple. For this reason, several countries have opted to increase self-sufficiency in edible oil.

Production deficits are due to a number of factors, among which neglect in oilcrops research, in both developed and developing countries has been a major one. This is particularly true for minor crops such as sesame. In the context of the IDRC oilcrops network, initiated in 1981, the interchange of information and the sharing of results between scientists have proved to be very useful and beneficial for the generation of scientific knowledge and the stimulation of research in this important area. It is hoped that conclusions and recommendations of this meeting will stimulate further research and development in the future.

A second important reason for limited national production has been the exceptionally low levels of world prices for oils and fats in the 1980's and the comparative advantage of importation over production for developing countries. The description of a case study using a system's approach to analysis the Vegetable Oil/Protein System of Kenya has stirred much interest during the Cairo meetings and it is hoped that similar work can be carried out in other countries in the future.

The Cairo meetings will also unfortunately be remembered as the one which has witnessed the diagnosis of the fatal disease of late Dr. Hiruy Belayneh, Chairman of the Brassica Subnetwork. We will all regret his absence.

On behalf of IDRC and of all participants, I would like to thank the Government of Egypt for its hospitality, the organizers for the excellent arrangements and all those who contributed to the success of these meetings by their presentations and discussions.

Eglal Rached,
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CONTENTS

REPORT ON ROOT-ROT AND WILT DISEASES OF SESAME IN EGYPT

A.A. El-Deeb

Sesame is one of the oldest oil seed crops in Egypt and many countries of the world. It is attacked by root-rot and wilt diseases, which are now wide spread especially in Quena, Sohag, Sharkia and Ismaelia Governorates. Root-rot caused by *Macrophomina phaseolina* and *Rhizoctonia solani* and wilt caused by *Fusarium oxysporum* f. sp. *sesami* and *Verticillium albo-atrum* were recorded on sesame in different countries.

Attempts were made to control root-rot and wilt diseases of sesame by selecting disease resistant genotypes treating the seed and/or soil with fungicides, and using different levels of NPK fertilizers.

Seed treatments

In general, seed dressing with some tested fungicides decreased infection percentage of sesame root-rot and wilt diseases when compared with the non-treated control, Table 1. Sumisclex (5g/kg seed), Benlate (5 g/kg seed) and Quinolate (6 g/kg seed) significantly reduced root-rot and wilt of sesame compared to the control and other treatments.

Also, seed yield was significantly increased over the control when the tested fungicides were applied in two doses. The highest seed yield was obtained with Sumisclex (5g/kg seed) followed by Benlate (5 g/kg seed) and Quinolate 15 CTS (6 g/kg seed).

Table 1. Effect of seed dressing on infection percent of root-rot and wilt and on yield of sesame under field conditions.

		Sohag*								Sharkia*							
	Dose	1984				1985				1984				1985			
Fungicides	g/kg seeds	R	W	R+W	Y	R	W	R+W	Y	R	W	R+W	Y	R	W	R+W	Y
Benlate	2	8.3	7.5	16.3	567	6.4	9.1	15.0	436	6.2	7.9	17.1	523	6.3	8.4	14.6	421
"	5	5.8	6.1	14.8	615	4.9	8.9	13.0	548	4.4	5.6	15.8	525	4.4	8.4	13.6	554
Sumisclex	3	7.5	6.7	15.0	576	6.6	9.0	15.6	491	6.2	6.8	16.3	573	6.3	8.9	15.3	464
"	5	5.0	5.8	14.2	654	5.5	7.5	12.4	588	4.2	5.8	15.4	625	4.3	7.9	13.3	615
Quninclate 15 CTS	3	7.1	7.1	14.6	581	7.9	7.3	17.9	491	5.0	7.5	14.2	553	7.6	8.5	18.0	440
"	6	4.2	6.3	13.8	845	7.0	5.6	15.7	540	5.0	5.0	14.2	615	7.3	7.6	14.3	509
V/captan	2	10.8	8.8	17.5	495	9.1	18.9	23.7	395	7.1	5.6	17.5	456	8.5	16.0	23.6	383
"	5	5.2	8.8	15.8	508	7.1	16.0	20.4	405	5.8	9.2	17.1	485	7.5	17.3	21.4	393
Quin. V 4x	3	12.9	9.6	18.8	440	10.6	20.6	23.6	381	10.0	10.4	17.1	438	10.3	13.6	23.0	370
"	6	11.3	9.2	18.8	486	9.9	18.1	21.5	369	8.8	10.4	17.1	514	9.4	16.9	21.1	405
Vitox	3	12.5	10.8	18.8	503	12.8	21.9	23.9	359	10.8	10.8	17.9	491	11.9	21.8	23.8	319
"	6	11.7	10.4	18.3	521	11.1	19.1	21.3	376	9.6	10.4	17.5	516	11.3	19.8	21.8	335
Homi	3	14.6	12.9	19.6	493	14.1	21.0	23.1	335	12.5	12.5	20.8	473	12.9	20.9	22.4	323
"	6	14.2	12.5	19.2	534	11.9	17.9	21.0	384	11.7	12.9	20.4	525	12.3	19.8	20.6	371
Rovral TMTD	3	16.7	13.3	19.2	429	15.3	22.0	23.6	331	12.9	13.8	20.8	468	14.8	22.5	24.0	313
"	6	16.3	12.9	19.6	446	12.8	20.5	22.8	361	12.5	13.3	20.4	480	13.4	21.6	23.4	314
Rezolex	3	10.0	11.3	16.7	563	8.4	14.1	19.8	396	9.2	10.8	17.1	586	7.5	15.4	19.8	395
"	5	9.6	7.5	15.4	573	7.1	13.3	16.9	426	8.3	10.0	15.8	584	6.6	14.0	16.1	421
Control	0	25.8	23.8	27.9	359	23.9	22.0	30.5	260	23.3	20.3	30.8	366	23.1	23.3	30.5	284
L.S.D. 5%		1.4	1.3	1.6	041	0.7	2.2	1.5	035	1.4	1.5	1.2	039	0.7	1.0	1.7	027

* R = Root rot, W = Wilt, Y = Yield in g/plot.

Results in Table 2 indicate that increasing the doses of Benlate, Sumisclex and Quinolate 15 CTS from 2 to 5 g/kg seed significantly reduced root-rot and wilt infections and increased seed yield. While the increase to 7 or 10 g/kg seed resulted in different reactions. Benlate at 10 g/kg seed showed some phytotoxicity effect, yellowed leaves and stunted plants. Generally, among the four tested rates, 5 g/kg seed was the best in reducing root-rot and wilt diseases.

Table 2. Effect of four rates of three fungicides as seed dressing on the infection percent of root-rot and wilt and on yield of sesame under field conditions.

		Sohag*								Sharkia							
	Dose	1985				1986				1985				1986			
Fungicides	g/kg seeds	R	W	R+W	Y	R	W	R+W	Y	R	W	R+W	Y	R	W	R+W	Y
Benlate	2	6.3	10.0	17.1	544	6.1	8.0	14.5	499	6.2	7.9	15.6	519	6.4	8.4	14.8	500
"	5	4.2	7.9	14.6	630	4.1	7.5	13.5	549	4.2	6.7	12.9	623	4.3	7.3	13.9	549
"	7	4.2	7.9	15.0	835	3.8	8.0	13.4	566	4.2	6.3	12.5	850	4.2	6.7	13.3	557
"	10	3.8	8.3	14.6	846	0.9	7.0	12.8	582	4.6	6.7	15.5	825	4.0	6.4	13.1	550
Sumisclex	2	5.8	9.8	17.5	595	6.0	9.0	15.6	512	6.3	7.1	16.3	561	4.8	9.3	16.4	491
"	5	3.8	7.5	15.0	670	4.5	7.8	14.5	574	4.3	6.5	14.2	859	4.0	7.3	13.2	532
"	7	4.2	7.9	14.2	646	3.8	4.7	13.3	619	3.8	5.0	13.8	645	3.8	7.2	15.2	547
"	10	3.8	7.9	14.2	646	3.9	7.4	12.6	618	4.2	6.7	14.2	625	3.7	6.8	15.4	545
Quinolage 15 CTS	2	6.7	10.4	17.7	580	7.0	9.2	17.8	445	6.2	7.9	14.2	574	7.2	8.3	17.4	448
"	5	4.2	6.3	15.0	674	6.2	6.3	14.5	509	4.2	7.1	11.3	680	6.2	7.4	18.0	535
"	7	4.6	7.5	15.4	674	6.6	7.8	13.0	518	4.2	7.1	11.3	676	6.0	7.3	13.5	554
"	10	4.6	8.3	14.6	669	6.2	6.9	12.5	520	4.2	7.1	12.1	660	6.2	7.3	13.5	554
Control	0	22.9	17.1	22.5	341	23.5	23.0	24.6	355	24.6	23.9	24.2	305	22.2	22.7	24.8	354
L.S.D. 5%		1.6	2.2	1.7	197	0.7	0.8	0.9	41	1.9	1.9	1.2	52	0.5	0.6	0.8	27

* R = Root rot, W = Wilt, Y = Yield g/plot.

Soil treatments

Sumisclex was the best in reducing root-rot and wilt diseases followed by Daconil 2787 and Benlate as compared to other treatments, Table 3. Generally, all the fungicides reduced infection and increased yield as compared to the control. When Sumisclex as a soil treatment is combined with Benlate 5g/kg seed as a seed dressing, the lowest infection and highest yield is obtained.

Varietal reaction

The ten tested sesame cultivars varied in their reaction to root-rot and wilt diseases under naturally heavily infested field conditions, Table 4. Mutation-48 was the least infected with root-rot and wilt diseases followed by Giza-32 and Mutation- 8 as compared to other cultivars. On the other hand, the highest percentage of infection was recorded on Giza-25 and Mutation-14.As regards to seed yield, Mutation-48 gave the highest yield followed by Giza-32, while Giza-25 and Mutation-14 gave the lowest yield.

Fertilization

Results in Table 5 indicate that percentage of root-rot and wilt diseases of sesame differed for the different levels of fertilizers. The highest yield and the least infection with the diseases were obtained with 30-30-48 followed by 30-30-24 NPK levels. On the contrary, the highest infection and

the least yield levels were obtained when no fertilizers were added preceded by 15 unit N only. Adding 15 P only reduced percentage of infection but yield remained low compared with other treatments.

Table 3. Effect of fungicidal soil treatment on the infection percent of root-rot and wilt and on yield of sesame under field conditions.

	Sohag**								Sharkia**							
	1985				1986				1985				1986			
Fungicides	R	W	R+W	Y	R	W	R+W	Y	R	W	R+W	Y	R	W	R+W	Y
Daconil 2787 (5 kg*)	4.6	4.6	6.3	759	4.6	4.9	8.4	769	4.2	4.6	8.3	0.775	3.8	4.5	8.3	779
Benlate (2 kg)	4.2	5.0	5.8	764	4.5	5.3	7.4	765	4.6	4.8	7.5	0.750	3.9	4.5	7.5	767
Sumisclex (4 kg)	4.2	3.8	5.4	790	4.1	5.0	7.3	779	3.8	4.2	7.5	0.775	3.4	4.5	6.9	785
Vitavax 3p (1.5 lit.)	4.9	5.0	6.7	743	4.4	6.3	8.6	689	4.2	6.7	8.3	0.783	4.4	6.5	7.5	759
Ronilan (4 kg)	5.0	5.0	6.7	734	5.0	6.1	11.1	677	5.4	5.6	7.5	0.772	5.3	6.5	12.1	640
Botren (5 kg)	5.4	9.2	11.3	655	5.1	8.8	12.0	629	5.8	10.4	12.5	0.648	5.6	10.5	12.4	636
Control 0	21.7	20.8	31.3	376	24.5	21.8	30.8	320	22.5	21.3	31.3	0.366	22.5	22.0	30.8	335
L.S.D. 5%	1.5	1.4	1.9	40	2.1	0.5	0.6	44	1.2	1.6	1.8	0.073	0.4	0.5	0.6	18

*Formulated material per faddan., ** R = Root rot, W = Wilt, Y = Yield g/plot.

Table 4. Percentage of infection with root-rot and wilt diseases and yield of ten sesame cultivars under field conditions.

	Schag*								Sharkia*							
	1985				1986				1985				1986			
Cultivars	R	W	R+W	Y	R	W	R+W	Y	R	W	R+W	Y	R	W	R+W	Y
Hagen 86/10	10.7	12.0	14.3	570	10.8	12.8	14.3	602	10.7	12.3	14.3	455	10.3	11.2	14.3	498
Mutation 48	6.0	7.8	9.2	788	6.0	7.8	7.5	734	5.4	7.2	7.3	740	4.3	6.0	8.7	713
" 5	12.0	13.2	15.3	520	12.2	11.2	12.3	525	10.8	12.2	14.2	423	11.3	13.0	14.7	475
Giza-32	5.8	10.5	12.7	734	5.5	8.0	10.7	707	5.8	10.0	11.0	672	6.3	8.3	13.5	700
Local 36	13.5	13.2	16.0	604	13.2	13.5	13.0	660	14.2	12.5	12.2	530	13.5	11.6	13.5	403
Giza-25	18.5	20.3	22.0	429	18.0	16.5	21.0	467	22.2	18.0	17.3	393	20.2	18.0	17.3	404
Mutation 14	17.50	19.7	21.2	492	16.2	15.7	17.8	498	21.0	15.5	19.8	335	18.0	15.2	21.8	412
Hagen 81/10	9.0	11.7	17.8	595	10.8	13.0	15.8	598	6.8	11.7	15.2	322	6.5	8.7	15.2	565
Mutation 8	7.5	12.5	17.3	622	8.3	11.5	16.3	640	8.0	17.3	17.3	520	6.7	15.3	16.3	554
Local 270	13.2	28.3	18.7	537	14.3	18.0	17.8	343	12.2	16.5	17.8	442	10.3	12.3	16.7	494
L.S.D 5%	1.9	1.7	2.1	787	2.5	1.9	2.4	72	2.0	1.7	2.7	73	2.2	2.4	2.9	61

R = Root rot, W = Wilt, Y = Yield g/plot.

Table 5. Effect of different levels of fertilizers (NPK) on the infection percent of root-rot and wilt and on yield of sesame under field conditions.

Treatments			Sohag 1985				Sharkia 1986			
N	P	K	Root-rot	Wilt	Root-rot and wilt	Yield g/10 m^2	Root-rot	Wilt	Root-rot and wilt	Yield g/10 m^2
0.0	0.0	0.0	28.5	32.3	27.2	296	28.3	24.8	28.8	286
15	0.0	0.0	23.2	24.3	22.3	363	22.3	24.2	23.5	335
30	0.0	0.0	24.2	22.8	24.0	400	23.0	23.7	23.7	390
0.0	15	0.0	17.5	21.0	18.5	371	18.5	22.7	23.3	346
30	15	0.0	17.5	20.0	19.0	418	18.8	18.8	23.2	410
30	30	24	18.7	20.3	19.3	431	16.0	18.0	23.5	453
30	30	48	16.8	13.3	17.3	475	16.3	15.8	22.8	481
45	30	24	19.7	22.3	21.8	460	19.5	22.0	22.5	461
45	30	48	18.7	21.2	20.5	471	18.7	21.3	21.8	481
L.S.D. 5%			1.6	2.7	2.1	29	1.5	1.8	1.8	27