

Updates on Sunflower Diseases in Manitoba

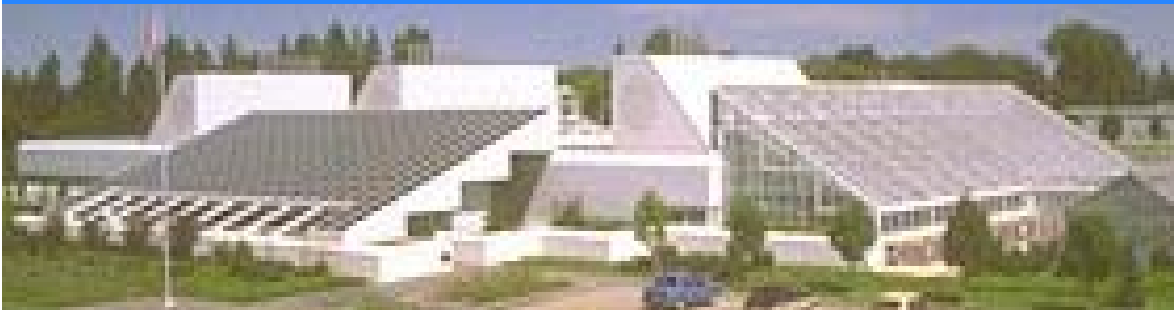
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MAJOR SUNFLOWER DISEASES IN CANADA

- * **SCLEROTINIA WILT, HEAD ROT, MID-STEM**
- * **VERTICILLIUM WILT**
- * **RUST**
- * **DOWNY MILDEW**

MINOR SUNFLOWER DISEASES IN CANADA

- * **Stem lesions: PHOMA and PHOMOPSIS**
- * **Leaf Spots: SEPTORIA and ALTERNARIA**
- * **Charcoal rot, Macrophomina**
- * **White rust, *Albugo spp.***
- * **Botrytis Head rot**
- * **Rhizopus head rot**
- * **Bacterial stem / head rot, *Erwinia spp.***
- * **Phytoplasma / Viruses, AY, CMV, SMV, SRSV, SYBLC**

Sunflower growing areas



Sclerotinia Wilt, Root and Basal stem infections, and Basal-stalk Rot

Mycelia from germinating sclerotia in the soil can infect the roots or main stem causing wilt and death of the plant

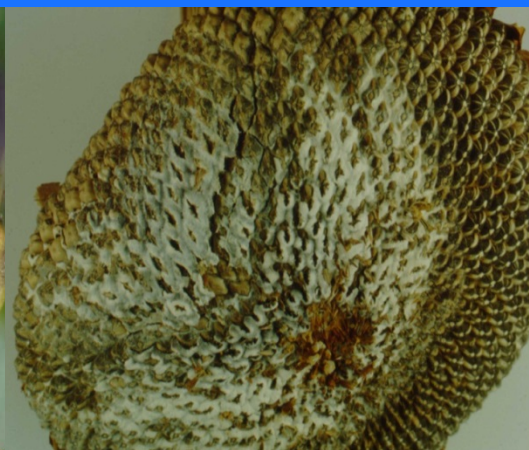
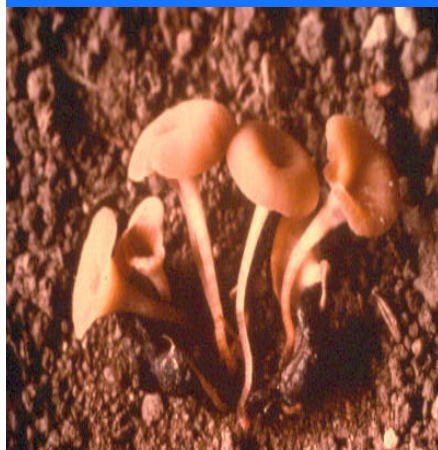
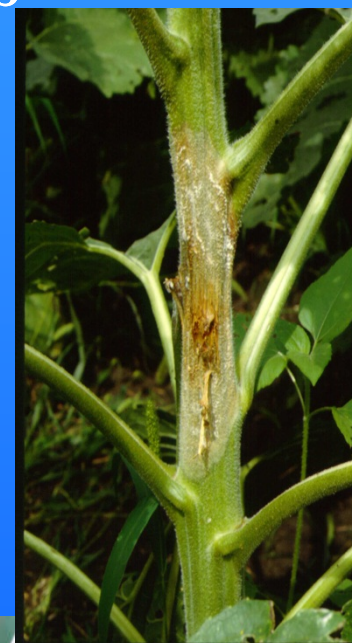
No of Crops	% of Crops	<u>Disease Incid./Severity</u>	
		Mean	Range
23 / 43	54%	4%	T – 5%



Head Rot and Mid-stem Infections

Carpogenic germination of sclerotia produces apothecia and ascospores which infect the heads and stems causing head rot and mid-stem rot

No of Crops	% of Crops	<u>Disease Incid./Severity.</u>	
		Mean	Range
16 / 43	37%	4%	T – 10%



Sclerotinia Head Rot Epidemics 2004



SUNFLOWER RUST *Puccinia helianthi*

* Very destructive, Explosive, New Races.

* Five spore stages on sunflower

• Overwinters locally on stubble

No of Crops	% of Crops	<u>Disease Severity (LAA).</u>	
		Mean	Range
36 / 43	84%	10%	T – 40%

Races:

355, %

737, %

747, %

777. %



Prevalence and Severity of Rust in Manitoba

Year	% Inf. Fld.	Mean-Dis %LAI	Range %LAI	Races old(new)
2014	84%	8%	T- 40%	4(700)
2013	55%	6%	T-40	4(700)
2012	55%	5%	T-10%	4(700)
2011	46%	5%	T-8%	4(700)
2010	40%	15%	T-40	4(700) & 3(300)
2009	70%	20%	T-40	4(700) & 3(300)
2008	74%	15%	T-50	3(300) & 4 (700)
2007	57%	10%	T-50	3 (300) & 4 (700)
2006	66%	6%	T-40	3 (300) & 4 (700)
2005	27%	8%	T-40	3 (300) & 4 (700)
2004	60%	8%	T-30	3 (300) & 4 (700)
2003	65 %	20	T->50	3 (300) & 4 (700)
2002	50 %	15	T->50	na
2001	27 %	8	T-20	na
2000	40 %	15	T->50	na
1999	60 %	5	T-20	na

Prevalent Sunflower Rust Races in Manitoba, 2003-12

Year	Race 100 (1)	Race 300 (3)	Race 500 (2)	Race 700 (4)
2003	12%	6%	0	82%
Prevalent Races	120, 126	326	-	726, 702, 736, 737
2004	20%	65%	0	15%
Prevalent Races	126, 106	326, 306, 320, 336	-	726, 727
2005	0	87%	0	13%
Prevalent Races	-	326, 336, 337, 376	-	726, 776, 777
2006	0	84%	4%	12%
Prevalent Races	-	320, 324, 326, 337, 365	520	734
2007	0	80%	4%	16%
Prevalent Races	-	336, 326, 304, 377	536	726, 736, 774
2008	0	62%	0	38%
Prevalent Races	-	336, 326, 320, 324 , 337	-	736, 724, 726, 734
2009	3	24%	0	73%
Prevalent Races	-	336, 326, 320, 324 , 337	-	736, 724, 726, 734
2010	0	7%	0	93%
Prevalent Races	-	336	-	726, 736, 776, 766
2011	0	0	0	100%
Prevalent races	-	-	-	726
2012	0	0	6%	94%
Prevalent Races	-	-	564	776, 726, 736
2013	0	0	5%	95%
Prevalent Races	-	-	540	776, 726, 736, 777
2014	0	60%	0	40%
Prevalent races	-	377, 375, 367, 355, 345, 337, 335, 330	-	737, 777, 735, 747, 757

DOWNY MILDEW *Plasmopara halstedii*

Soil-, and seed-borne, systemic
Favored by wet soil, < 18 ° C
Several races, fungicide resistant races

No of Crops	% of Crops	<u>Disease Incid./Severity</u>	
		Mean	Range
19 / 43 Late	44%	8%	T – 10%
20 Early	100%	10%	T - 10%

Races:

722

732

772

702



DM race changes 2005-2013

Year	Race 100 (1)	Race 300 (2, 6, 7)	Race 500 (4)	Race 700 (3)
2005	12%	21%	5%	62%
Races	100	300	500	700-730?
2006	8%	16%	21%	55%
Races	100	333, 300	500, 560	733, 773, 700
2007	4%	25%	11%	59%
Races	130	330, 300	510, 530	730, 710, 700
2008	NA	41%	NA	59%
Races	NA	330, 320	NA	730, 720, 700
2009	NA	10%	NA	90%
Races	NA	330, 320	NA	730, 770, 773
2010	5%	13%	2%	75%
Races,	110, 120	320, 330	520	720, 730, 770
2011	0	17%	3%	80%
Races,	-	334, 300	500	730, 720, 700
2012	0	21% 0	0	79%
Races	-	331, 333	-	732, 730, 720
2013	5%	10%	2%	83%
Races	102, 120	300, 310, 320	500	700, 732, 700
2014	0	2%	2%	96%
Races	-	322	522	722, 732, 702, 772

VERTICILLIUM WILT, LEAF MOTTLE

V. dahliae, *V. albo-atrum*

Soil-borne, seed-borne, systemic

No of Crops	% of Crops	<u>Disease Incid. /Severity.</u>	
		Mean	Range
39/43	91%	10%	T – 40%



STEM LESIONS, Phoma, Phomopsis

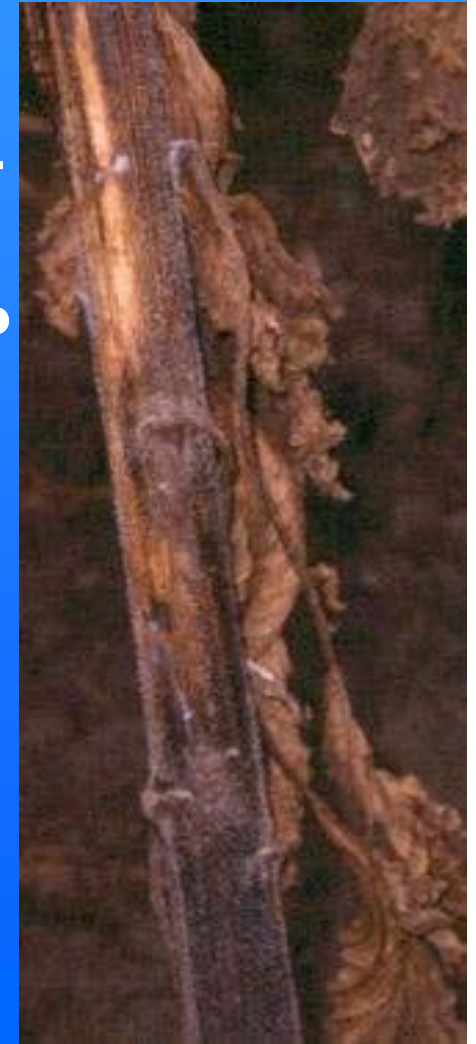
Phoma macdonaldii

Phomopsis helianthi

Phomopsis

No of Crops	% of Crops	<u>Disease Severity</u>	
		Mean	Range
10 / 43	23%	4%	T – 5%

Phoma



Leaf Spots, Septoria & Alternaria

No of Crops	% of Crops	<u>Disease Severity</u>	
		Mean	Range
16 / 43	37%	4%	T – 5%

Septoria



SUNFLOWER DISEASES 2014/13/ 12/11/10

Disease	<u>% of Fields</u>					<u>Range % Incidence / Severity</u>				
	14	13	12	11	10	14	13	12	11	10
ScL. Wilt	54	36	82	46	55	T-5	T-5	T-50	T-5	T-30
ScL. Hd Rot	37	33	24	27	21	T-10	T-5	T-5	T-1	T-20
Verticillium	91	76	67	64	30	T-50	1-40	T-60	T-20	T-10
D. Mildew	44	24	20	82	58	T-5	T-5	T-5	T-10	T-30
Rust	84	55	55	46	40	T-40	1-40	T-15	T-8	T-30
Septoria	37	52	63	9	42	T-5	1-10	T-30	T-1	T-5
P. Mildew	T	T	T	10	5	T-1	T-1	T-1	T	T-5
Phoma/ Phomopsis	23	18	27	10	30	T-5	T-5	T-1	T-5	T-5

THANK YOU

QUESTIONS ?