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Agroscope

Scoring and evaluation of leaf and glume blotch on wheat

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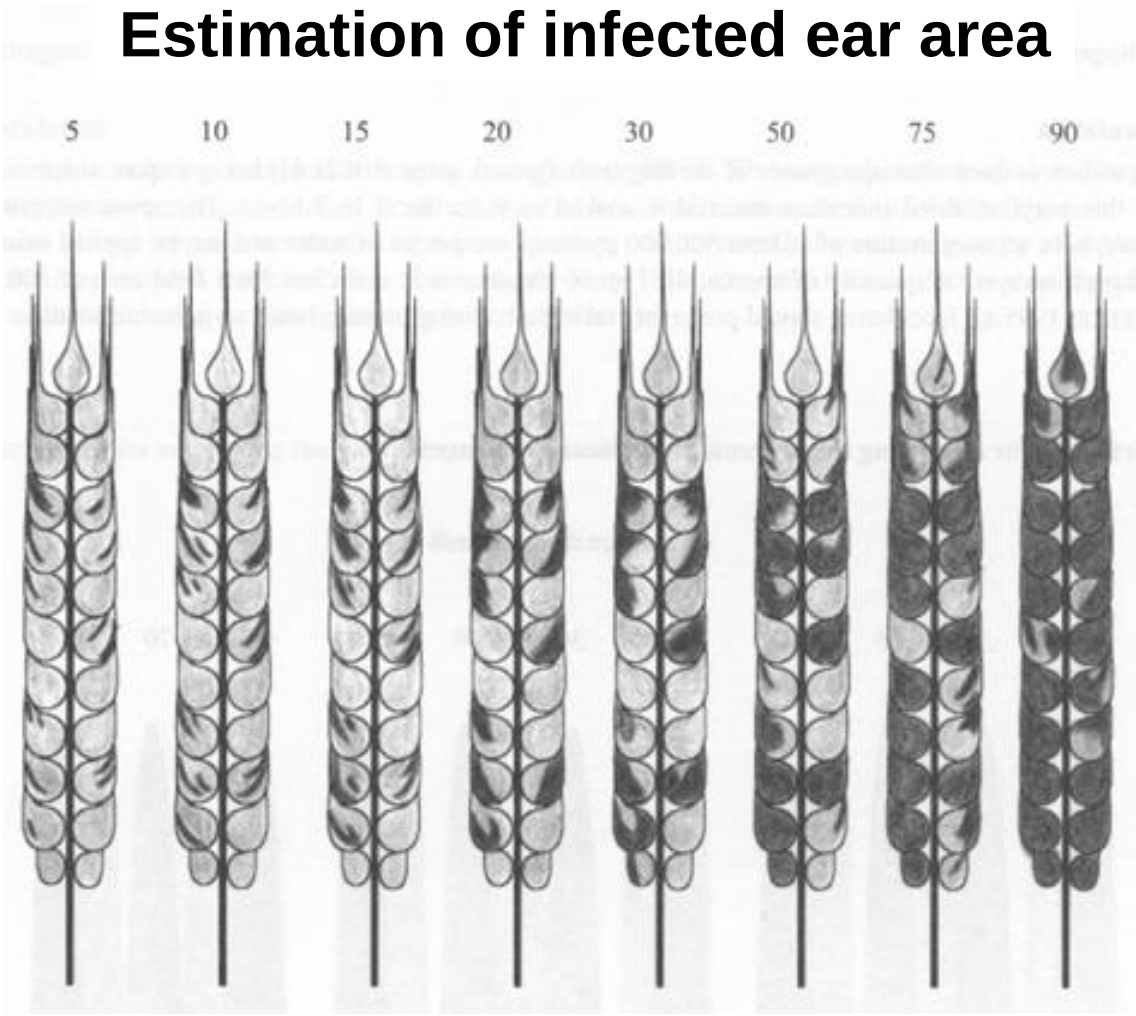
Septoria glume blotch (*P. nodorum*)

Estimation of infected ear area



Source: RESI

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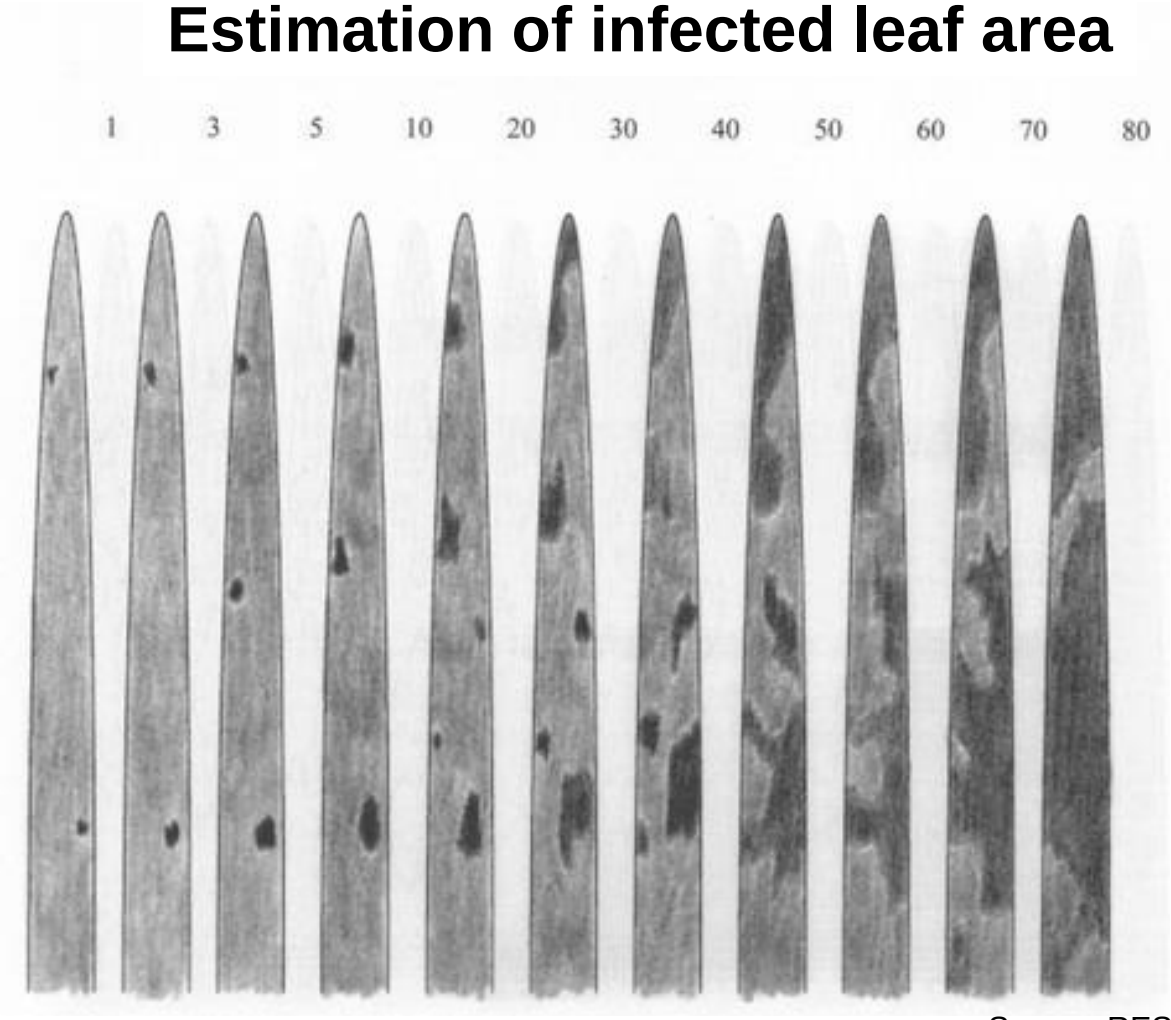
Septoria leaf blotch (*P. nodorum*)

Estimation of infected leaf area



Source: RESI

Scoring scheme

Note	% surface	Symptom
1	0	No symptoms
2	2.5	Few symptoms
3	10	1/10 of the leaf or spike with symptoms
4	25	1/4 of the leaf or spike with symptoms
5	50	1/2 of the leaf or spike with symptoms
6	75	1/4 of the leaf or spike without symptoms
7	90	1/10 of the leaf or spike without symptoms
8	97.5	Few parts of the leaf or spike without symptoms
9	100	Leaf or spike completely covered with symptoms

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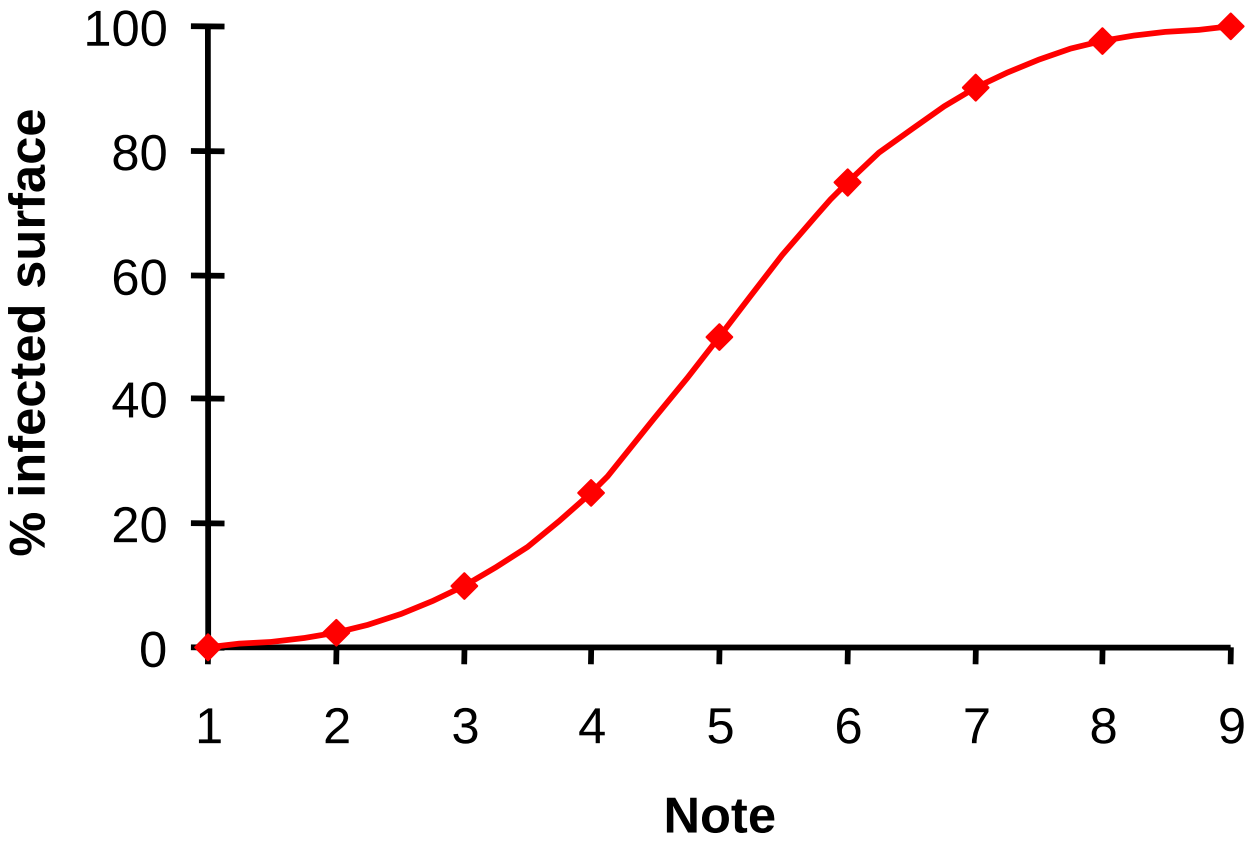
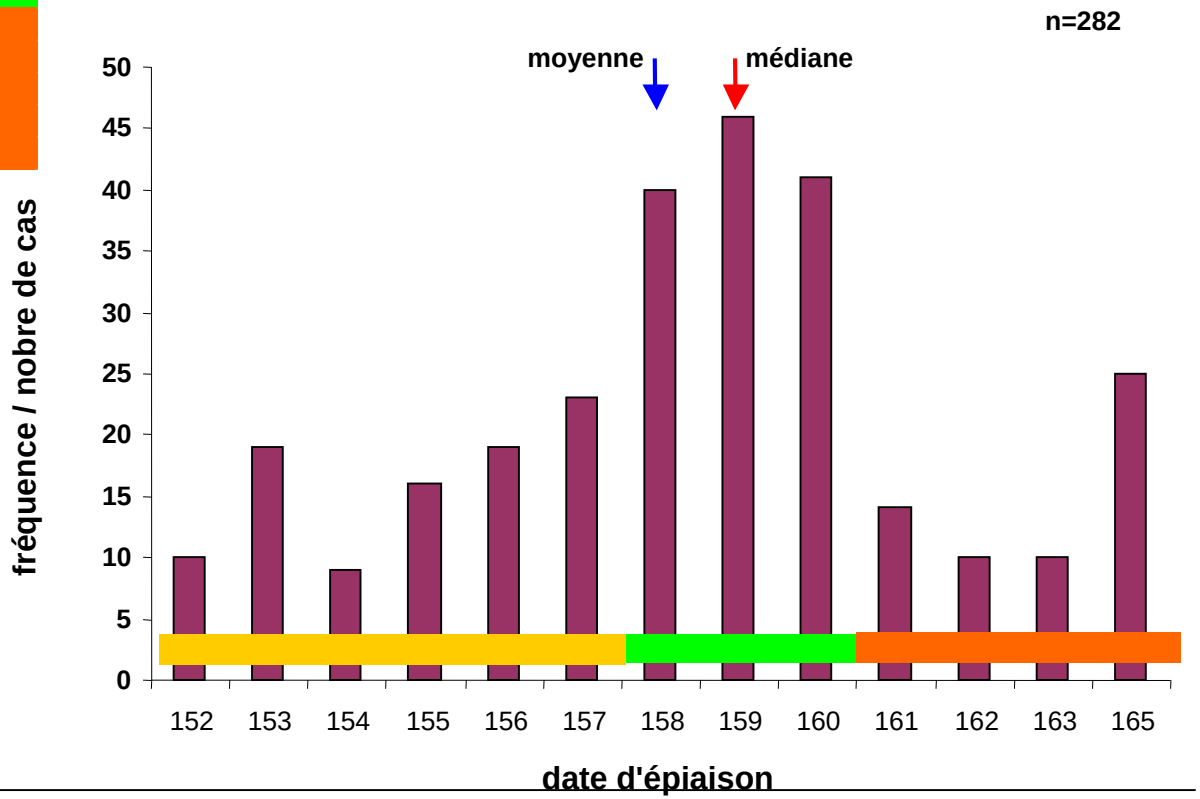
The severity scoring curve



Epiaison du blé de printemps en 2007

date d'épiaison	no.cv	no. de cas	tertils
152	10	10	
153	19	29	
154	9	38	précoce
155	16	54	
156	19	73	
157	23	23	
158	40	63	intermédiaire
159	46	109	
160	41	150	
161	14	164	
162	10	174	tardif
163	10	184	
165	25	209	



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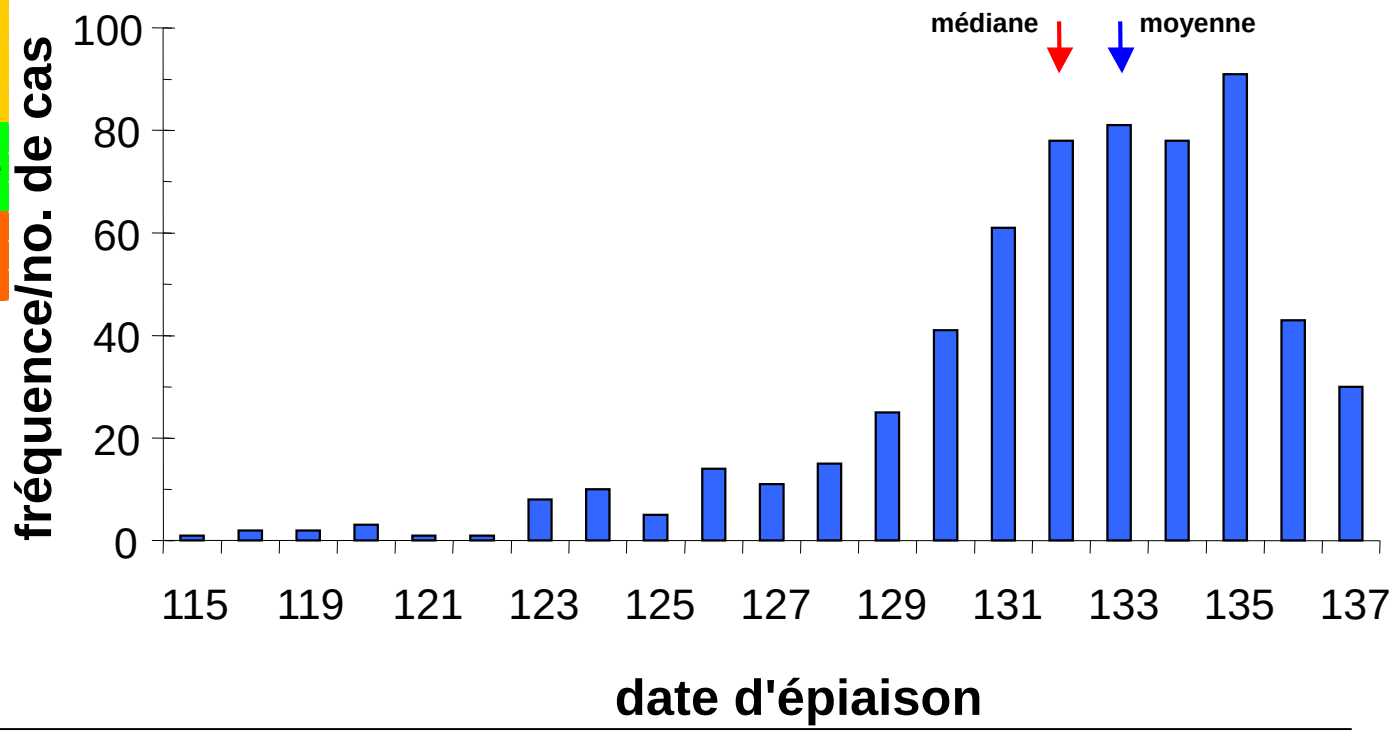
Epiaison du blé d'automne en 2007

date d'épiaison	no.cv	cas	tertils
115	1		
117	2		
119	2		
120	3		
121	1		
122	1		
123	8		
124	10		précoce
125	5		
126	14		
127	11		
128	15		
129	25		
130	41		
131	61	200	
132	78		intermédiaire
133	81		
134	78	237	
135	91		tardif
136	43		
137	30	164	



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Characteristics of the disease

- The pathogen is a saprophyte with a biotrophic phase. Inoculum sources are the soil and contaminated seeds
- Severity of the disease depends on
  - Climatic conditions
  - Resistance of the host.
  - Physiological status of the host plant.
- Host resistance
  - Polygenic and monogenic (e.g.sensibility to TSN1).
  - Interactions with environmental conditions.
  - Interactions with other resistances (Lr34, Lr46 …).

Phenotyping the resistance

Aim of resistance phenotyping

- Provide reliable information on resistance traits, stable in time and in various locations.
- Understand and determine degree of GxE interactions.

Approach

- Verify the influence of earliness in breeding material.
- Set up a experimental protocol to test the correction of «septoria» scorings according to earliness.
- Test the usefulness of the corrections over several years.
- Examine GxE interaction once scorings are stabilized.

Appreciation of disease resistance by corrections and Indices

- Developed by P. Fried and colleagues in the 1970-80s
- Some references by CIMMY (van Beuningen and Kohli, 1990; van Ginkel and Rajaram, 1999)

Aims

- Precision phenotyping for septoria diseases.
- Reduce the fluctuations between years (and sites).
- Take into account the dynamics of the diseases throughout the season.
- Consider the earliness of the genotypes.
- Standardize the method and make it comparable between sites and years.

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S. nodorum sur feuille en 2007

nom	précocité	AUDPC	INDEX AUDPC	INDEX CLASSE
RUNAL	133	71.2	119	119
ARINA	133	82.8	132	132
LEVIS	133	73.5	117	117
MUVERAN	132	44.3	70	70
SIALA	128	68.8	109	98
ZINAL	130	63.0	100	105
CLARO	131	73.5	117	105
COMBIN	131	49.0	78	66
FOREL	132	89.8	143	143
MAYEN	134	58.3	93	93
NARA	132	54.8	87	87
CAMEDO	131	52.5	83	72
DELLORO	127	86.3	137	126
CAROTI	133	33.8	54	54
CITRUS	137	28.0	45	48
POTENZIAL	136	68.8	109	113
RUSTIC	130	51.3	82	70
AZZURO	133	47.8	76	76
STRIKER	136	46.7	74	78
MILVUS	137	78.2	124	128

S. nodorum sur feuille 2006 et 2007

	2006		2007		
nom	précocité	INDEX CLASSE	précocité	INDEX CLASSE	LR 2008
RUNAL	149	106	133	119	Ø
ARINA	153	116	133	132	-
LEVIS	149	107	133	117	Ø
MUVERAN	149	78	132	70	Ø
SIALA	148	71	128	98	Ø
ZINAL	145	68	130	105	Ø
CLARO	149	100	131	105	
COMBIN	148	113	131	66	
FOREL	149	94	132	143	
MAYEN	150	79	134	93	
NARA	149	89	132	87	
CAMEDO	149	54	131	72	
DELLORO	148	84	127	126	
CAROTI	153	74	133	54	
CITRUS	159	68	137	48	
POTENZIAL	154	93	136	113	
RUSTIC	149	107	130	70	
AZZURO	149	84	133	76	
STRIKER	154	73	136	78	
MILVUS	156	104	137	128	

Conclusions and outlook

- Development of leaf and glume blotches depend on the earliness of the variety.
- Yet, earliness is not linked to varietal resistance.
- By correcting the scores according to the earliness, severity appreciation results more stable for both diseases.
- Observations on a 6 to 7 years scale show differences in genotype stability.
- Stability is due to genotype x environment interactions, but further investigations are required.
- Mainly on the effect of environment, herbicides and other farming factors.
- Infections with *Mycospaerella graminicola* become more important all over Europe!

Merci de votre attention