

LFN-0424 Fitopatologia

Aula Prática

Doenças do Grupo VI – Galhas e Nematoides



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Escola Superior de Agricultura Luiz de Queiroz
Departamento de Fitopatologia e Nematologia
Piracicaba 23-24 Outubro 2019

Doenças do Grupo VI

Processo afetado

Uso de fotossintetizados

Plasmodiophora brassicae
Agrobacterium tumefaciens
Meloidogyne spp.

Hérnia das brássicas
Galha da coroa
Galhas radiculares

Outros fitonematoides sedentários
Heterodera spp.
Globodera spp.

Rotylenchulus spp.
Tylenchulus spp.
Nacobbus spp.

Carvões
Cáries
Viroses

Plasmodiophora brassicae

Plasmodiophora brassicae

Hérnia das Brassicáceas (Crucíferas)



Meloidogyne spp. vs. *P. brassicae*

Repolho



<https://www.forestryimages.org/browse/detail.cfm?imgnum=5513027>

P. brassicae

Ciclo

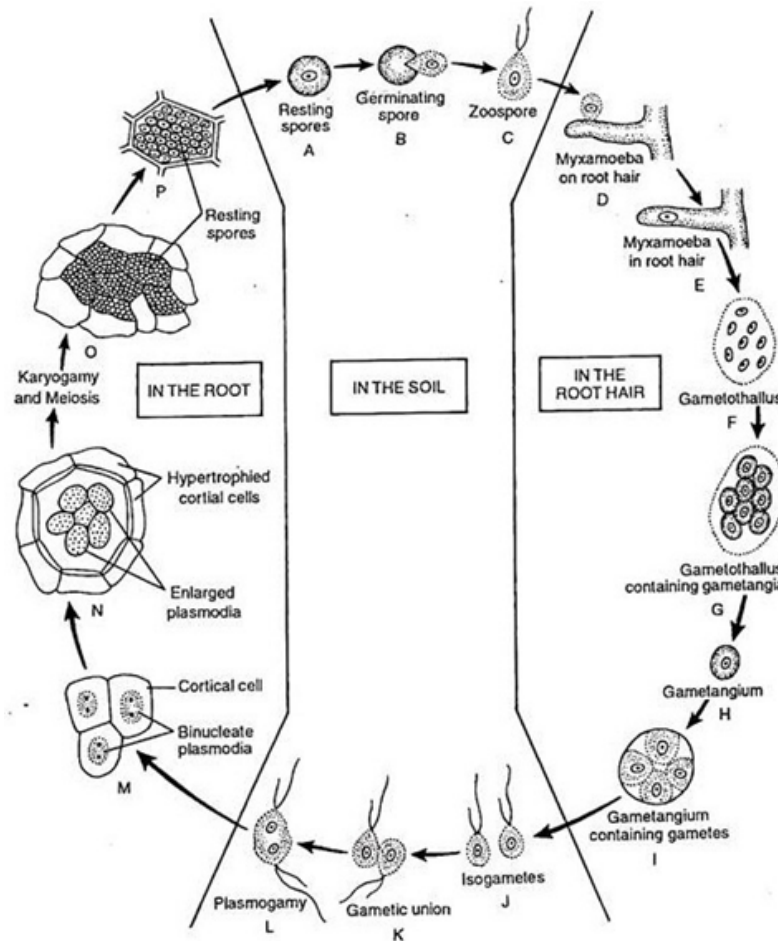
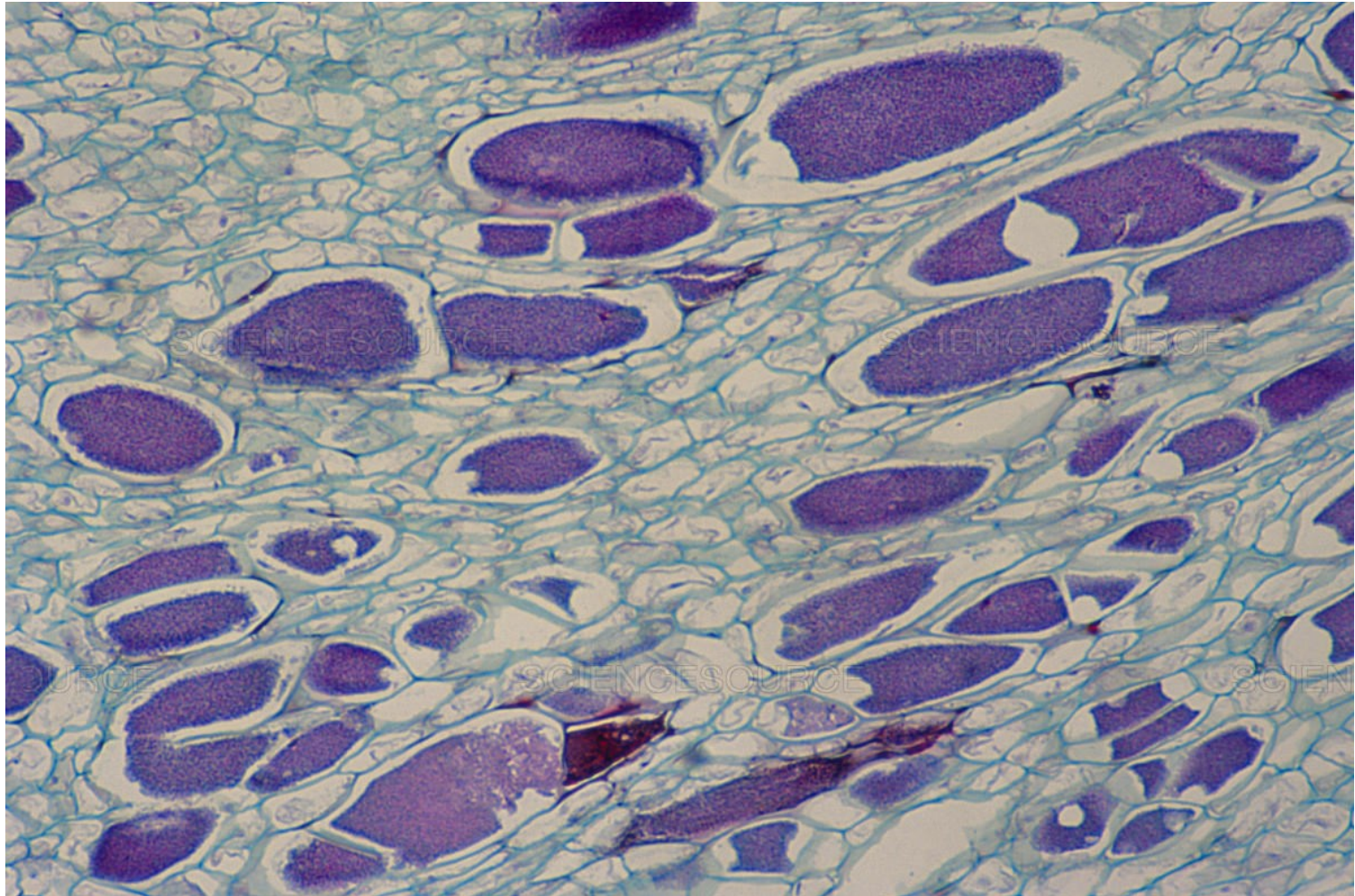
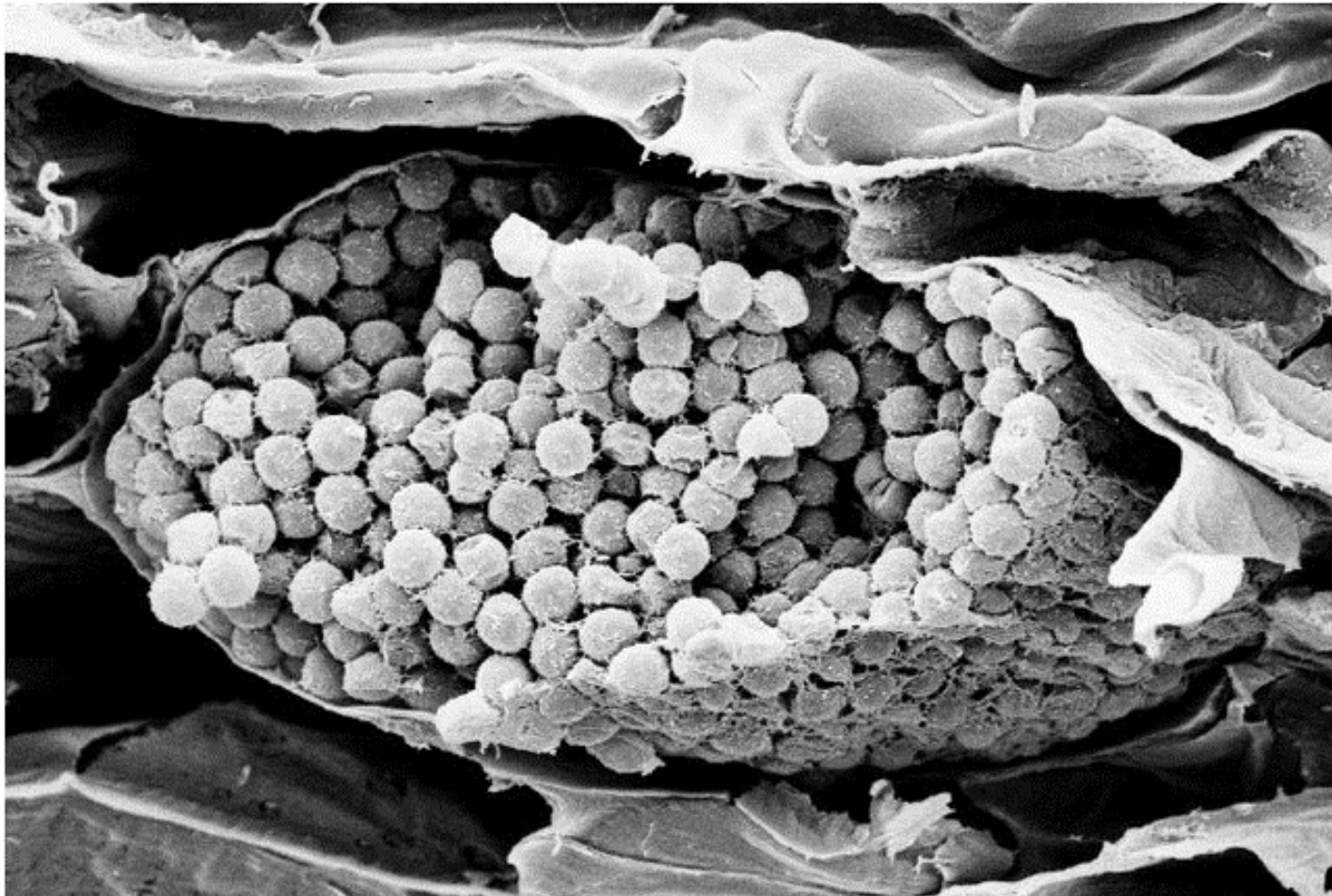


Fig. 4.14 : Life cycle of *Plasmodiophora brassicae*

P. brassicae
Esporotalo



P. brassicae
Esporos de Resistência



https://www.researchgate.net/publication/30072729_Persistence_of_Plasmodiophora_brassicae/figures?lo=1

P. brassicae

Dano em Acelga / Couve-Chinesa (*Brassica rapa* var. *pekinensis*)



P. brassicae

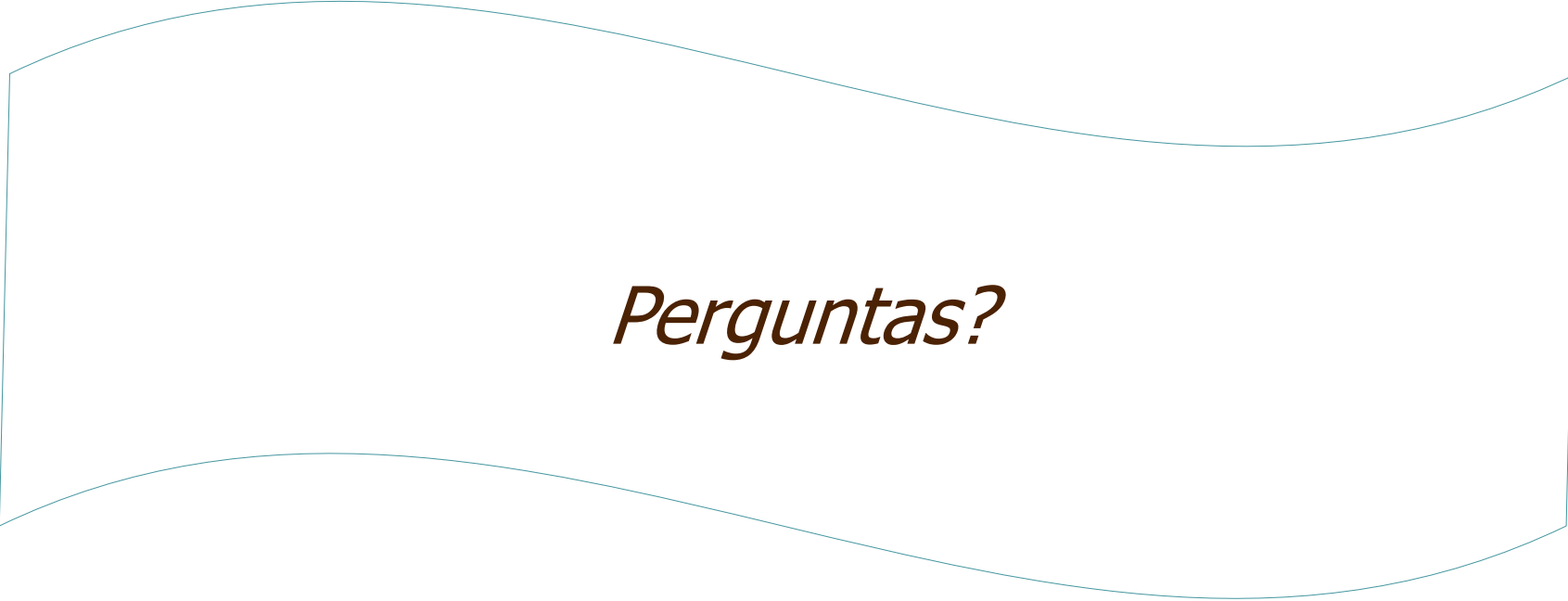
Sintomas / Danos em Repolho e Canola



P. brassicae

Dano em Repolho (*Brassica oleracea* var. *capitata*)



A light blue wavy rectangular frame with a thin border, containing the text "Perguntas?".

Perguntas?

Agrobacterium tumefaciens

A. tumefaciens

Galha da Coroa



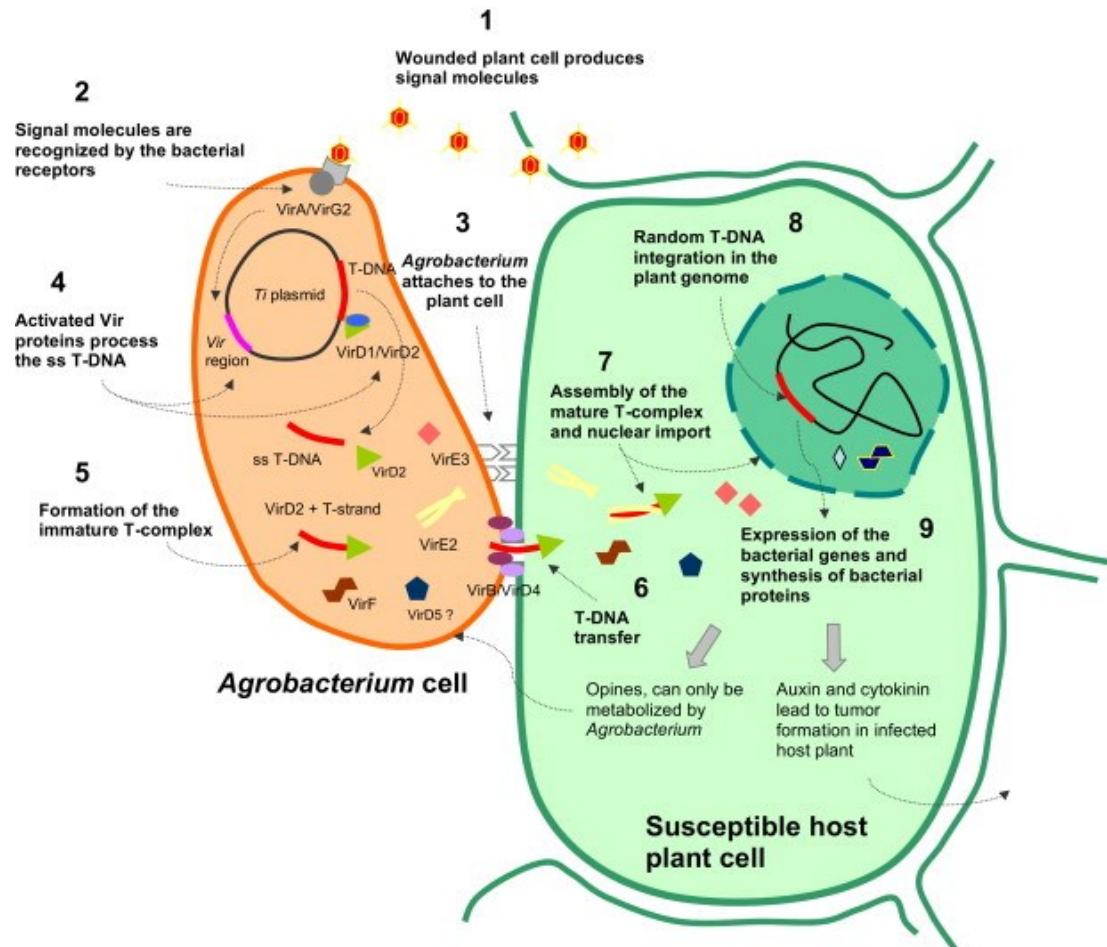
<http://ericabiologiacool.blogspot.com/2015/04/blog-post.html>



<http://blogs.ifas.ufl.edu/nfrec/2017/10/20/rose-crown-gall-becoming-more-prevalent-in-florida/>

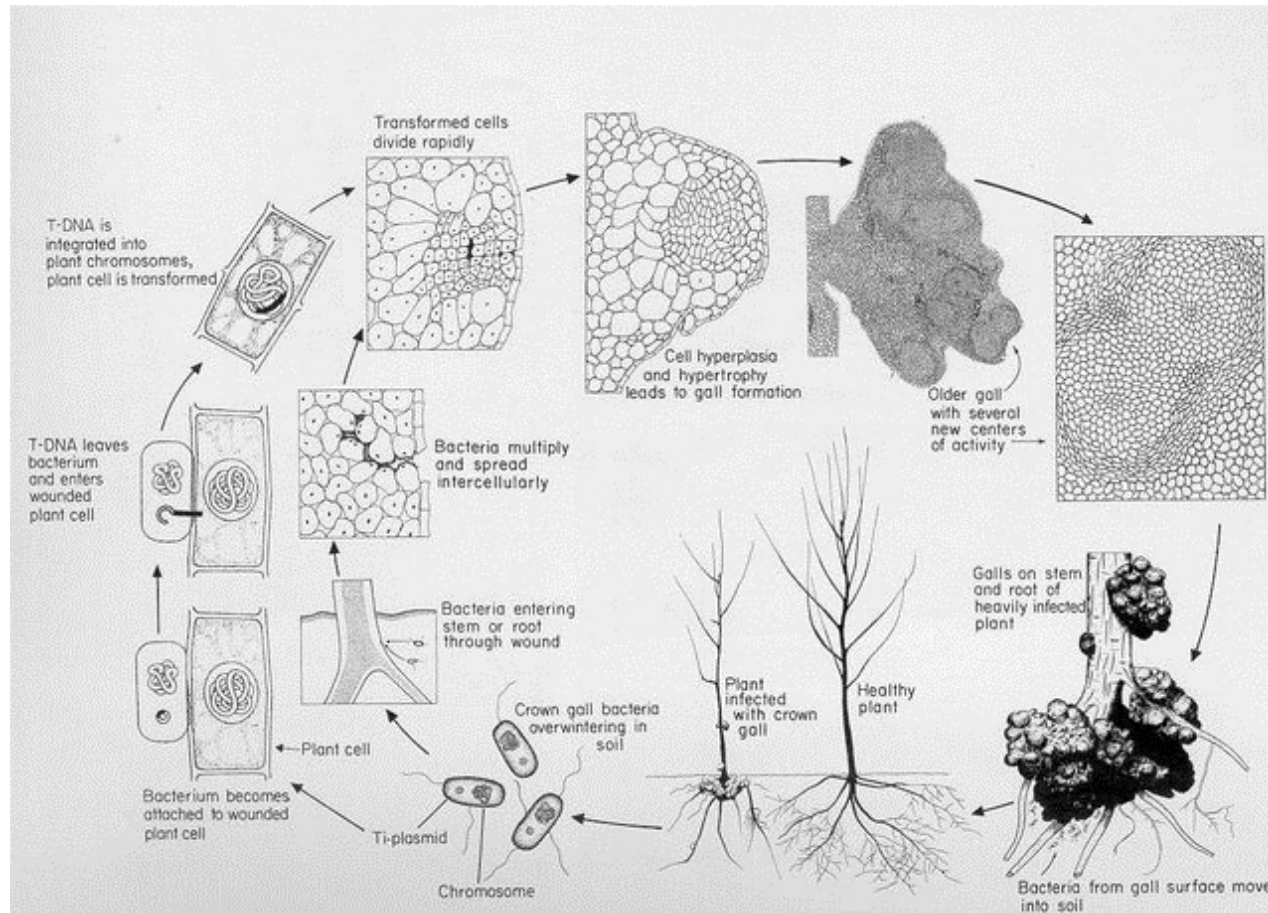
A. tumefaciens

Infecção



A. tumefaciens

Ciclo



https://www.researchgate.net/publication/268388539_PREVALENCE_INCIDENCE_AND_SEVERITY_OF_CROWN_GALL_DISEASE_OF_CHERRY_APPLE_AND_APRICOT_CAUSED_BY_AGROBACTERIUM_TUMEFACIENS_IN_DISTRICT_GILGIT_AND_HUNZANAGAR/figures?lo=1

A. tumefaciens
Galho / Castanheira-da-Índia



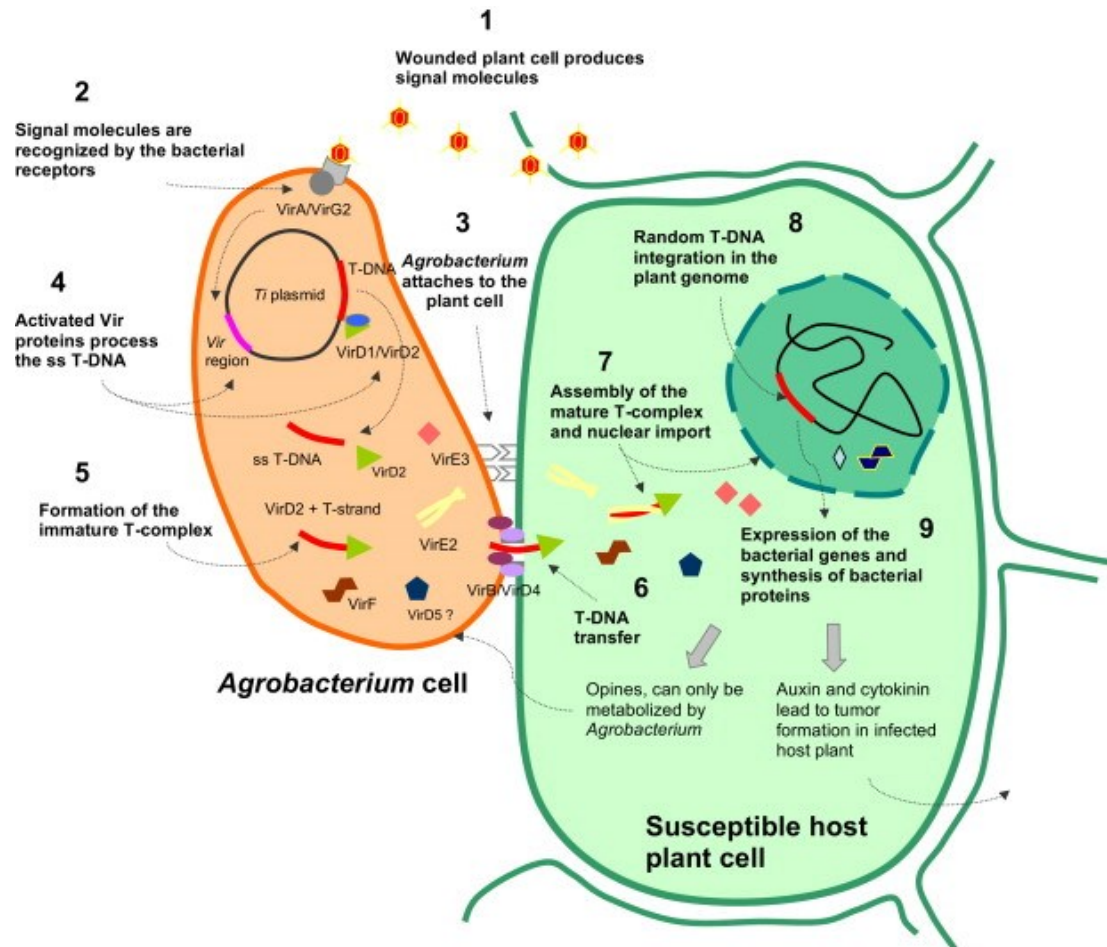
<https://www.naturespot.org.uk/species/agrobacterium-tumefaciens>

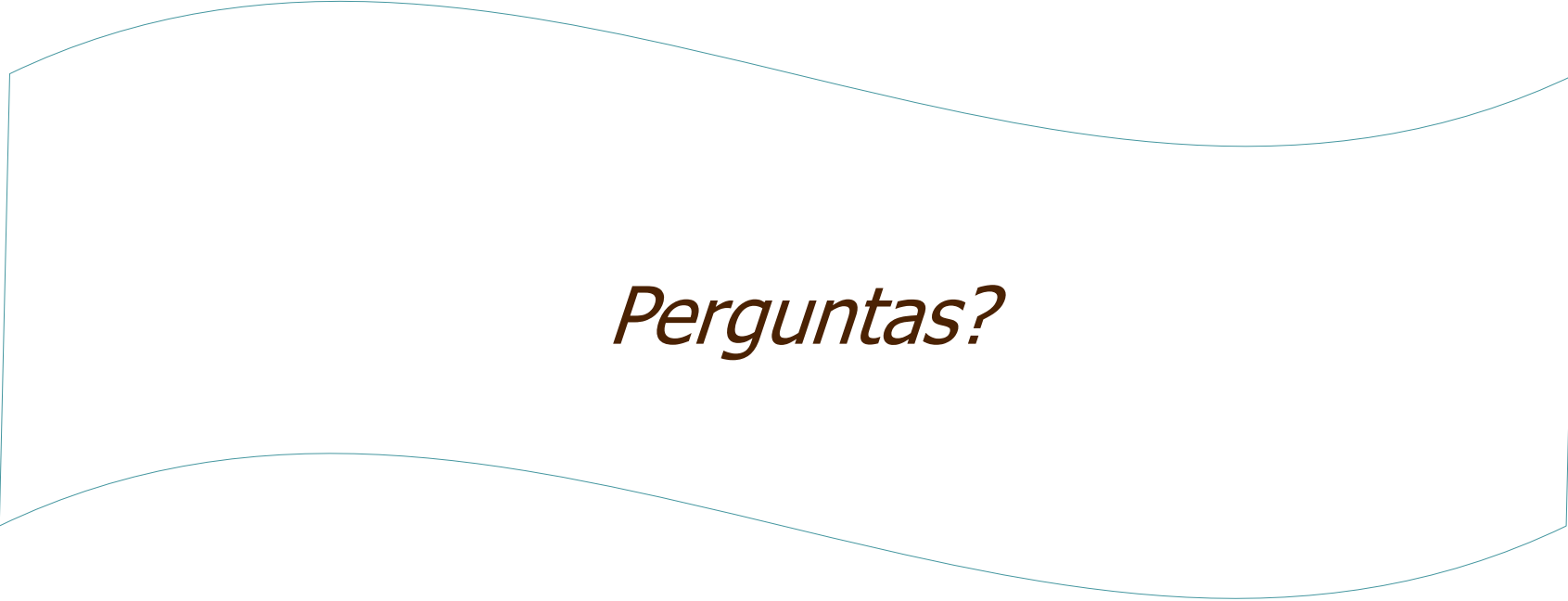
A. tumefaciens
Videira



A. tumefaciens

Infecção



A light blue wavy rectangular frame with a thin border, featuring a gentle wave pattern along its top and bottom edges.

Perguntas?



Meloidogyne spp.

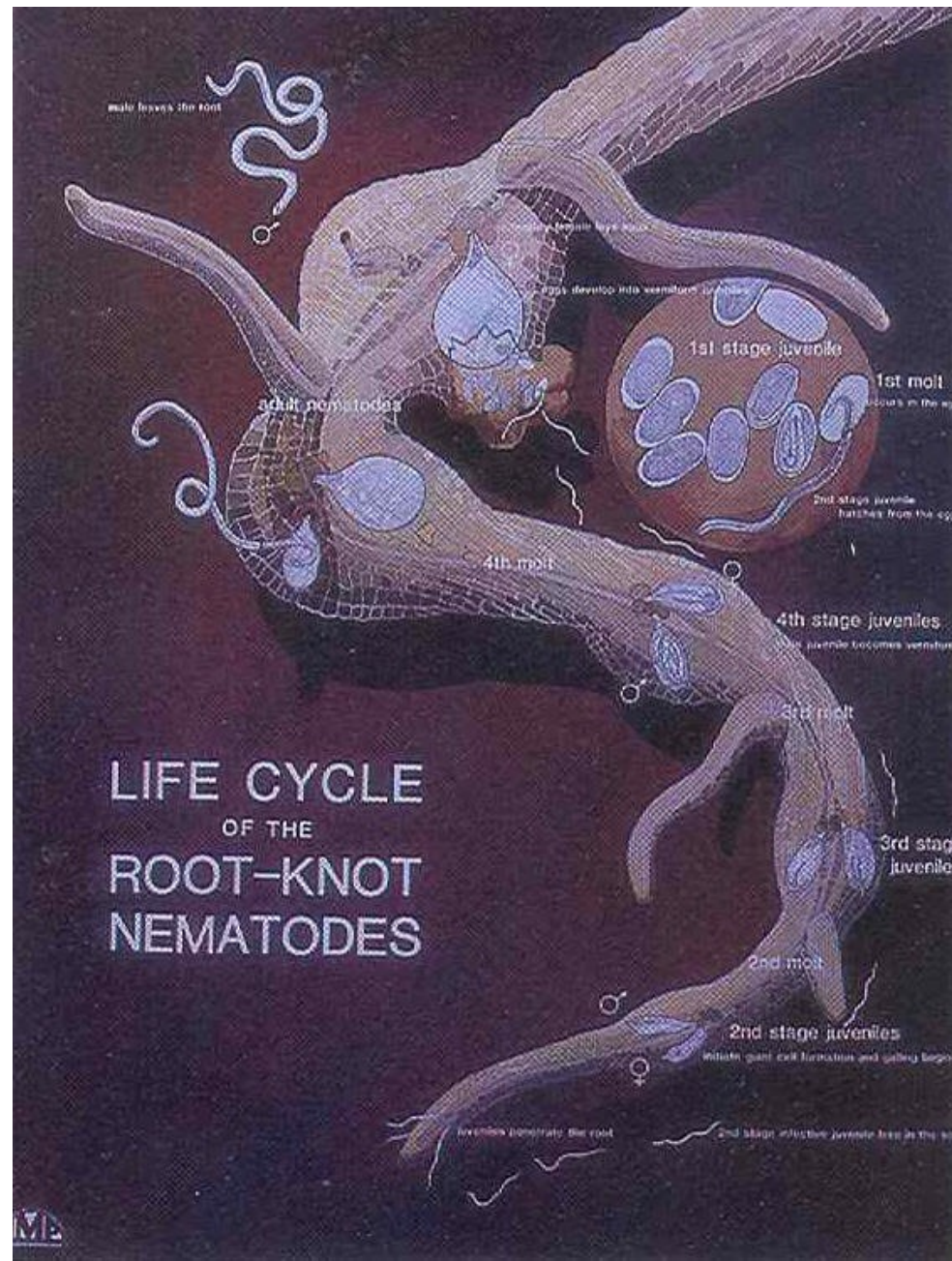
Meloidogyne spp.

Nematoides das Galhas



Fotos Dárcio Carvalho Borges (2008)



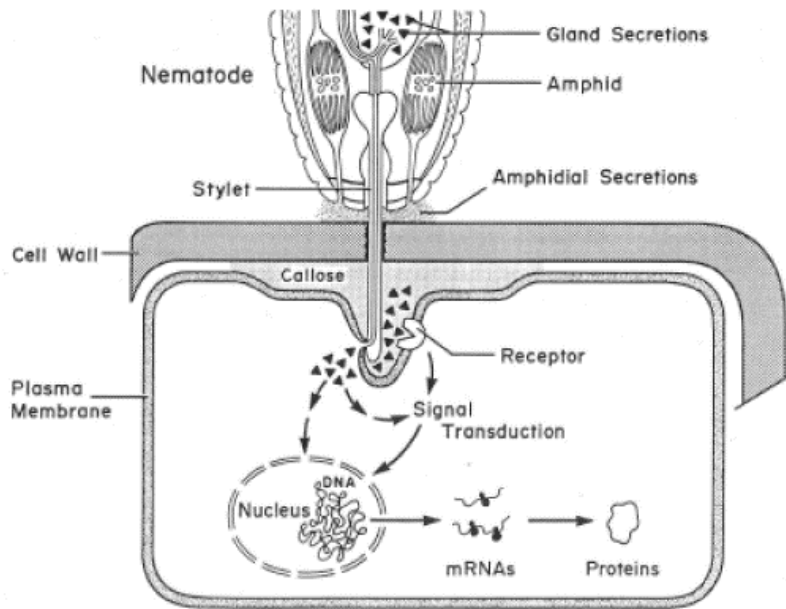




Fotos Cecília Rodrigues da Silva
<http://www.agencia.cnptia.embrapa.br/gestor/pimenta/arvore/CONT000gn0k9bx902wx5ok0liq1mqut1365k.html>

Meloidogyne spp.

Infecção



Produzem o único alimento do nematoide

Degeneram depois da morte do nematoide



Meloidogyne paranaensis



IPR 100 x Catuaí Vermelho

<http://fundacaoprocafe.com.br/sites/default/files/publicacoes/pdf/18%20-%20Lan%C3%A7amento%20Ipr100%2038%C2%BA.CongrBrasPesqCafeeira%20Caxambu.pdf>

Galhas x Nódulos Bacterianos



<http://www.plantmanagementnetwork.org/pub/php/research/2005/soybean/image/nematode5sm.jpg>





Feijoeiro-guandu

Fotos João Victor Zinsly – 25 fev 2019



Crotalaria spectabilis



Crotalaria ochroleuca

Fotos João Victor Zinsly – 25 fev 2019

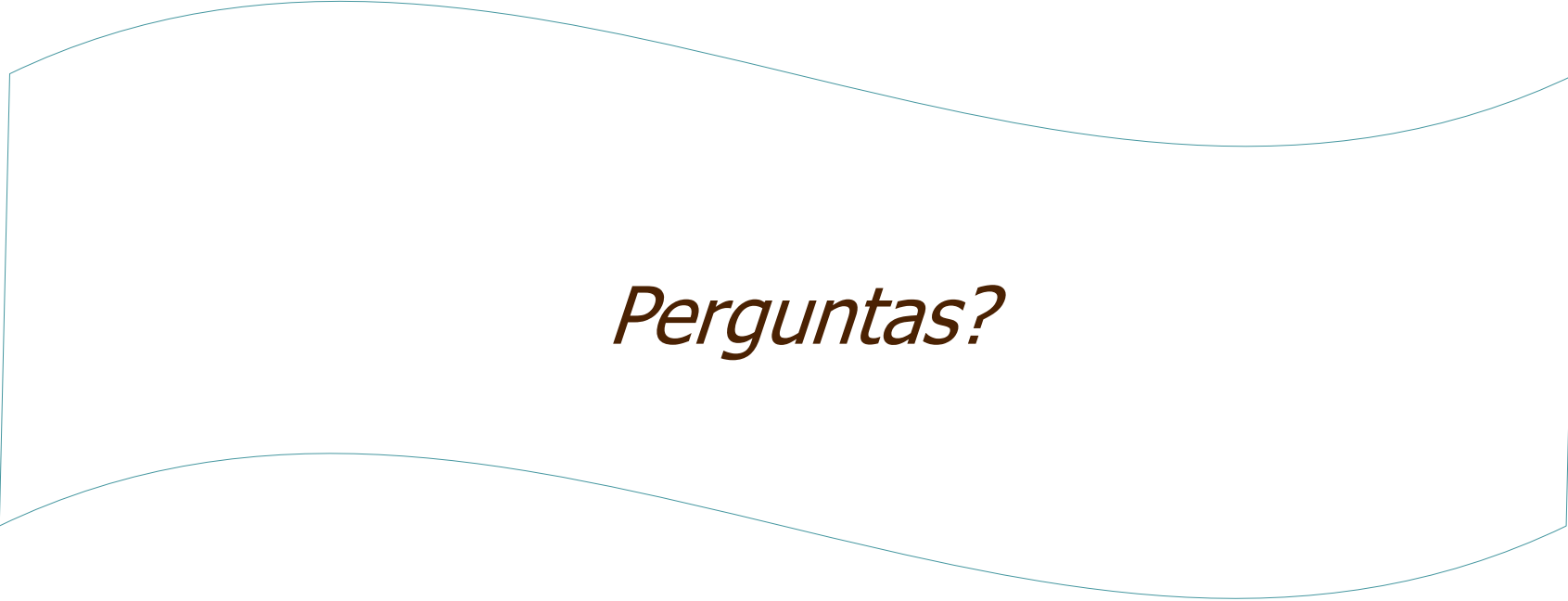


Crotalaria spectabilis



Crotalaria ochroleuca

Fotos João Victor Zinsly – 25 fev 2019

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Perguntas?



Heterodera spp.

Foto Rodrigo Gonçalves Trevisan (2015)



<https://bio-protocol.org/e1707>

Heterodera glycines

Nematoide de Cisto da Soja



Foto Hércules Diniz Campos

Alto potencial destrutivo

Folhas amarelas
Plantas pequenas

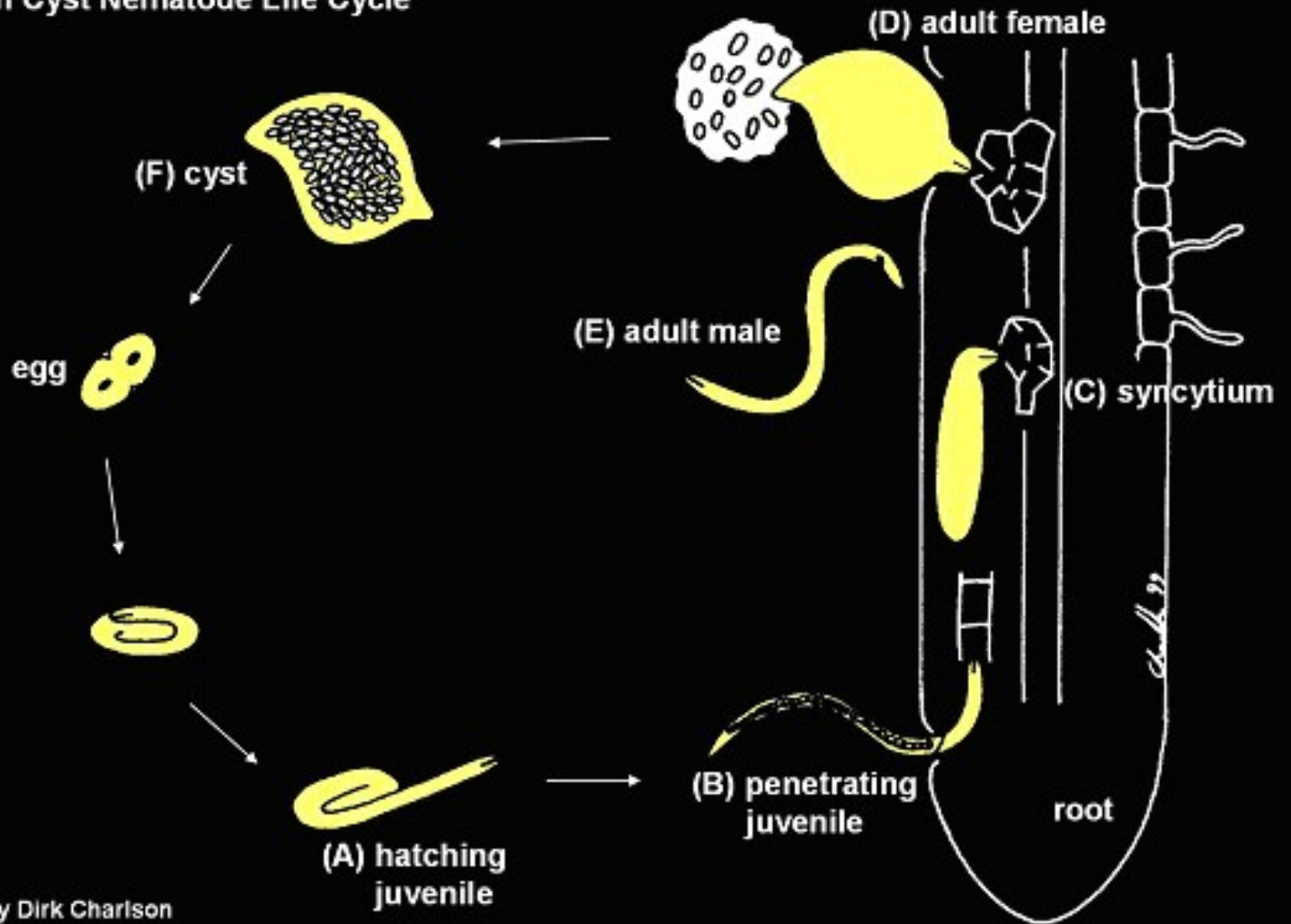
Escurecimento e destruição de
raízes

Rápida dispersão
Reboleiras grandes





Soybean Cyst Nematode Life Cycle



<https://plantsciencesweb.missouri.edu/mitchumlab/whatare.htm>

Perdas Anuais Doenças Soja

Estados Unidos

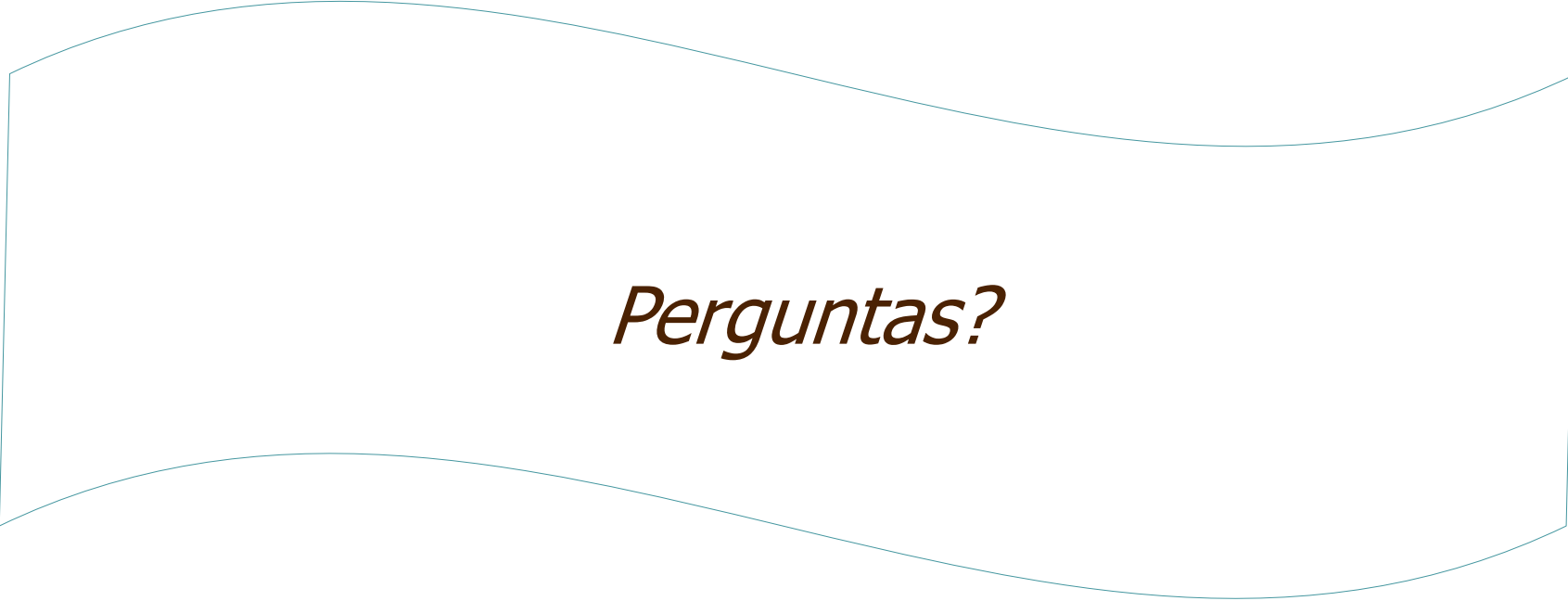
		Perdas (mil t)				
Patógenos / Doenças		1996	2002	2004	2006	2007
<i>Heterodera glycines</i>		5.820	3.889	3.721	3.369	2.558
<i>Meloidogyne</i> spp. e outros		161	136	140	216	170
<i>Phytophthora sojae</i>		1.102	1.251	1.554	1.464	683
Tombamentos		597	594	1.200	362	923
<i>Macrophomina phaseolina</i>		336	863	295	698	820
<i>Sclerotinia sclerotiorum</i>		614	79	1.633	362	139
<i>Cercospora sojina</i>		23	191	310	345	257
Síndrome Morte Súbita		0,1	781	1.152	744	601
Vírus		65	818	61	203	184
Total		10.894	10.494	13.206	11.175	8.079

Wrather & Koenning (2009) Effects of Diseases on Soybean Yields in the United States 1996 to 2007





Figura Embrapa

A light blue wavy rectangular frame with a thin border, containing the text "Perguntas?".

Perguntas?