



# SWEET CORN



Boil smut	Damping off
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Fusarium cob rot	Head smut
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**WHAT SHOULD I LOOK FOR?**



Formation of large pale green to silvery galls on cob up to 150mm  
*W. Upham, Kansas State University, Bugwood.org*












Over time galls become dark and eventually burst releasing black spores  
*L. Tesoriero, NSW DPI*

<p><b>WHERE WILL I SEE SYMPTOMS?</b></p>  <p>WHOLE PLANT</p>	<p><b>FAVOURABLE CONDITIONS FOR DISEASE DEVELOPMENT</b></p> <div style="display: flex; justify-content: space-around;">    </div> <p>WARM          • 20-25°C</p> <p>HIGH SOIL NUTRITION</p> <p>DAMAGE TO COB</p>
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<p><b>DISTRIBUTION IN THE FIELD</b></p> <p><b>SCATTERED</b></p> <p>Individual/small patches of infected plants</p> 	<p><b>HOW DOES IT SPREAD?</b></p> <div style="display: flex; justify-content: space-around;">    </div> <p>FREE WATER</p> <p>MOVEMENT OF CONTAMINATED SOIL</p> <p>WIND</p> <p><b>SURVIVAL TIME WITHOUT HOST</b>   More than 10 years</p>
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## HOW DO I CONTROL IT?

<p><b>FALLOW/COVER CROP</b></p>	<p><b>FARM HYGIENE</b></p> <p>Stop movement of contaminated soil, water, plants and equipment</p> 	<p><b>HOST-FREE ZONE</b></p> <p>Control volunteer host plants and weeds</p> 	<p><b>CROP ROTATION</b></p> <p>Select non-host rotation or cover crops</p> 
<p>• Spores can survive 5 to 7 years out of corn</p>			
<p><b>PLANTING PREPARATION</b></p>	<p><b>CROP SELECTION</b></p> <p>Choose a resistant/less susceptible cultivar</p> 	<p><b>CHEMICAL FUMIGATION</b></p> <p>Always use with care and as per label</p> 	<p><b>CHEMICAL TREATMENT</b></p> <p>Treat seed/seedlings with registered fungicide</p> 
<p>• Consult APVMA or InfoPest website for current registered products</p>			
<p><b>POST-PLANT</b></p>	<p><b>GOOD NUTRITION</b></p> <p>Ensure plants' nutritional needs are met</p> 	<p><b>AVOID WATER STRESS</b></p> <p>Ensure plants receive adequate water</p> 	<p><b>AVOID PLANT INJURY</b></p> <p>Avoid any physical damage to plant</p> 
<p>• Particularly important at the seedling stage</p>			

# DAMPING OFF

*Pythium spp.* | *Fusarium spp.* | *Sclerotium rolfsii* | *Rhizoctonia solani*

## WHAT SHOULD I LOOK FOR?



Can cause seed rot, in which case seedling will fail to germinate leading to bare patches.  
A. Roberston, Iowa State University, Extension and Outreach



Seedlings that do emerge may have yellow to light brown discoloration around stem at ground level. As the disease progresses, stem eventually collapses leading to wilting and death  
W. Brown Jr., Bugwood.org















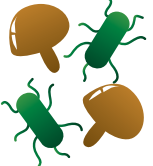


Symptoms appearing post emergence may also include severe stunting as shown in plants on the left compared to a healthy plant on the far right.  
J. Thomsen, Iowa State University, Extension and Outreach

<p><b>WHERE WILL I SEE SYMPTOMS?</b></p> <p>STEM BASE ROOTS</p>	<p><b>FAVOURABLE CONDITIONS FOR DISEASE DEVELOPMENT</b></p> <p>COOL WATERLOGGED SOIL DELAYED SEEDLING EMERGENCE</p> <ul style="list-style-type: none"> <li>• 13-18°C</li> <li>Some pathogens prefer warmer conditions i.e. &gt;25°C</li> </ul>
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<p><b>DISTRIBUTION IN THE FIELD</b></p> <p><b>LARGE AREAS</b></p> <p>Large areas of infected plants clearly visible</p>	<p><b>HOW DOES IT SPREAD?</b></p> <p>FREE WATER MOVEMENT OF CONTAMINATED SOIL WIND CONTAMINATED PLANT DEBRIS INSECTS</p> <p><b>SURVIVAL TIME WITHOUT HOST</b>   More than 10 years</p>
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## HOW DO I CONTROL IT?

<p><b>FALLOW/COVER CROP</b></p>	<p><b>FARM HYGIENE</b></p> <p>Stop movement of contaminated soil, water, plants and equipment</p> 	<p><b>HOST-FREE ZONE</b></p> <p>Control volunteer host plants and weeds</p> 	<p><b>CROP ROTATION</b></p> <p>Select non-host rotation or cover crops</p> 	<p><b>IMPROVE SOIL HEALTH</b></p> <p>Add organic matter or amendments to boost beneficial microbes</p> 	<p><b>BIO FUMIGATION</b></p> <p>Grow a biofumigant crop</p> 
<p><b>PLANTING PREPARATION</b></p>	<p><b>CHEMICAL FUMIGATION</b></p> <p>Always use with care and as per label</p> 	<p><b>CHEMICAL TREATMENT</b></p> <p>Treat seed/seedlings with registered fungicide</p> 	<p><b>SOIL TEST</b></p> <p>Conduct a pre-sowing soil test to help predict level of risk</p> 	<p><b>NO RESIDUE AT PLANTING</b></p> <p>Ensure no plant residues from host crops at planting</p> 	<p><b>DRAINAGE</b></p> <p>Plant on raised beds or well-draining soil</p> 
<p><b>POST-PLANT</b></p>	<p><b>IRRIGATION MANAGEMENT</b></p> <p>Monitor crop and soil to optimize amount and timing</p> 	<p><b>AVOID PLANT INJURY</b></p> <p>Avoid any physical damage to plant</p> 	<p><b>GOOD NUTRITION</b></p> <p>Ensure plants' nutritional needs are met</p> 	<p><b>CONTROL PESTS</b></p> <p>Control insect pests that spread spores</p> 	<p><b>BIOCONTROL PRODUCTS</b></p> 

• Minimum 3 years out of corn

• Consult APVMA or InfoPest website for current registered products

# FUSARIUM COB ROT

*Fusarium verticillioides* | *F. proliferatum* | *F. subglutinans*.

## WHAT SHOULD I LOOK FOR?




White streaks start from tips of individual kernels then spread out in a “starburst” pattern.  
Ontario Ministry of Agriculture, Food and Rural Affairs















Advanced fungal growth may appear white, pink or salmon coloured. Dangerous toxins are released from infected cobs and corn is not suitable for human consumption.

*L. Osborne, Bugwood.org*

<p><b>WHERE WILL I SEE SYMPTOMS?</b></p>  <p>COB</p>	<p><b>FAVOURABLE CONDITIONS FOR DISEASE DEVELOPMENT</b></p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="465 1300 613 1444"> <p>HOT</p> <ul style="list-style-type: none"> <li>• 25-30°C</li> </ul> </div> <div data-bbox="638 1300 786 1444"> <p>PLANT STRESS</p> <ul style="list-style-type: none"> <li>• Moisture or nutrition</li> </ul> </div> <div data-bbox="810 1300 958 1444"> <p>PHYSICAL DAMAGE</p> </div> </div>
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<p><b>DISTRIBUTION IN THE FIELD</b></p> <div style="border: 1px solid green; padding: 5px; margin: 10px 0;"> <p><b>SCATTERED</b></p> <p>Individual/small patches of infected plants</p>  </div>	<p><b>HOW DOES IT SPREAD?</b></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div data-bbox="1668 1209 1809 1353"> <p>WIND</p> </div> <div data-bbox="1825 1209 1966 1353"> <p>INSECTS</p> </div> </div> <ul style="list-style-type: none"> <li>• Spores enter via silks or wounds</li> </ul> <div style="background-color: #e67e22; color: white; padding: 5px; display: flex; justify-content: space-between; align-items: center;"> <p><b>SURVIVAL TIME WITHOUT HOST</b></p> <p>Less than 10 years</p> </div>
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## HOW DO I CONTROL IT?

<p><b>FALLOW/COVER CROP</b></p>	<p><b>FARM HYGIENE</b></p> <p>Stop movement of contaminated soil, water, plants and equipment</p> 	<p><b>HOST-FREE ZONE</b></p> <p>Control volunteer host plants and weeds</p> 	<p><b>CROP ROTATION</b></p> <p>Select non-host rotation or cover crops</p> 		<p><b>IMPROVE SOIL HEALTH</b></p> <p>Add organic matter or amendments to boost beneficial microbes</p> 	<p><b>BIO FUMIGATION</b></p> <p>Grow a biofumigant crop</p> 
<p><b>PLANTING PREPARATION</b></p>	<p><b>CROP SELECTION</b></p> <p>Choose a resistant/less susceptible cultivar</p> 	<p><b>NO RESIDUE AT PLANTING</b></p> <p>Ensure no plant residues from host crops at planting</p> 	<p><b>ADJUST DATE</b></p> <p>Adjust planting/harvest date to reduce infection risk</p> 		<p><b>FERTILISER SELECTION</b></p> 	<p>• Stop movement of infected soil, remove infected plants/roots</p> <p>• Minimum 3 years out of corn</p> <p>• Husks that prevent or delay insect entry</p> <p>• Early plantings less prone to infection</p> <p>• Avoid ammonium fertilisers. Nitrate fertilisers can help suppress disease</p>
<p><b>POST-PLANT</b></p>	<p><b>IRRIGATION MANAGEMENT</b></p> <p>Monitor crop and soil to optimize amount and timing</p> 	<p><b>ADJUST DATE</b></p> <p>Adjust planting/harvest date to reduce infection risk</p> 	<p>• Avoid delays in harvest that may result in split kernels and increasing risk of infection</p>		<p><b>AVOID PLANT INJURY</b></p> <p>Avoid any physical damage to plant</p> 	



**WHAT SHOULD I LOOK FOR?**



Infection occurs during early vegetative stage. Symptoms appear at flowering/cob formation. Tassel symptoms include distortion and formation of masses of black spores  
 R. Croissant, Bugwood.org










Cobs may also be replaced by a mass of black spores with a stringy appearance and often in a tear-drop shape  
 Agriculture and Agri-Food Canada, Agriculture and Agri-Food Canada, Bugwood.org

<p><b>WHERE WILL I SEE SYMPTOMS?</b></p> 	<p><b>FAVOURABLE CONDITIONS FOR DISEASE DEVELOPMENT</b></p>  <p>• 20-30°C</p>
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<p><b>DISTRIBUTION IN THE FIELD</b></p> <p><b>SCATTERED</b></p> <p>Individual/small patches of infected plants</p> 	<p><b>HOW DOES IT SPREAD?</b></p>  <p><b>SURVIVAL TIME WITHOUT HOST</b>   3-10 years</p>
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## HOW DO I CONTROL IT?

<p><b>FALLOW/COVER CROP</b></p>	<p><b>FARM HYGIENE</b></p> <p>Stop movement of contaminated soil, water, plants and equipment</p> 	<p><b>HOST-FREE ZONE</b></p> <p>Control volunteer host plants and weeds</p> 	<p><b>CROP ROTATION</b></p> <p>Select non-host rotation or cover crops</p>  <ul style="list-style-type: none"> <li>• Minimum 5 years out of corn</li> </ul>	<p><b>BIO FUMIGATION</b></p> <p>Grow a biofumigant crop</p> 
<p><b>PLANTING PREPARATION</b></p>	<p><b>CROP SELECTION</b></p> <p>Choose a resistant/less susceptible cultivar</p>  <ul style="list-style-type: none"> <li>• Select hybrids with fast emergence</li> </ul>	<p><b>CHEMICAL FUMIGATION</b></p> <p>Always use with care and as per label</p>  <ul style="list-style-type: none"> <li>• Consult APVMA or InfoPest website for current registered products</li> </ul>		
<p><b>POST-PLANT</b></p>	<p><b>GOOD NUTRITION</b></p> <p>Ensure plants' nutritional needs are met</p>  <ul style="list-style-type: none"> <li>• Ensure adequate nitrogen</li> </ul>			