Salahaddin University \Erbil
College of Agriculture
Field crop Department
3rd class

Field crop diseases\Practical

4th lecture

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Microscope Slides Preparation

To prepare the slide: (fungi)

Reagents:

1- lacto phenol

Liquid used for fixing and fast examining for infected parts with fungi.

2- slide and cover slide

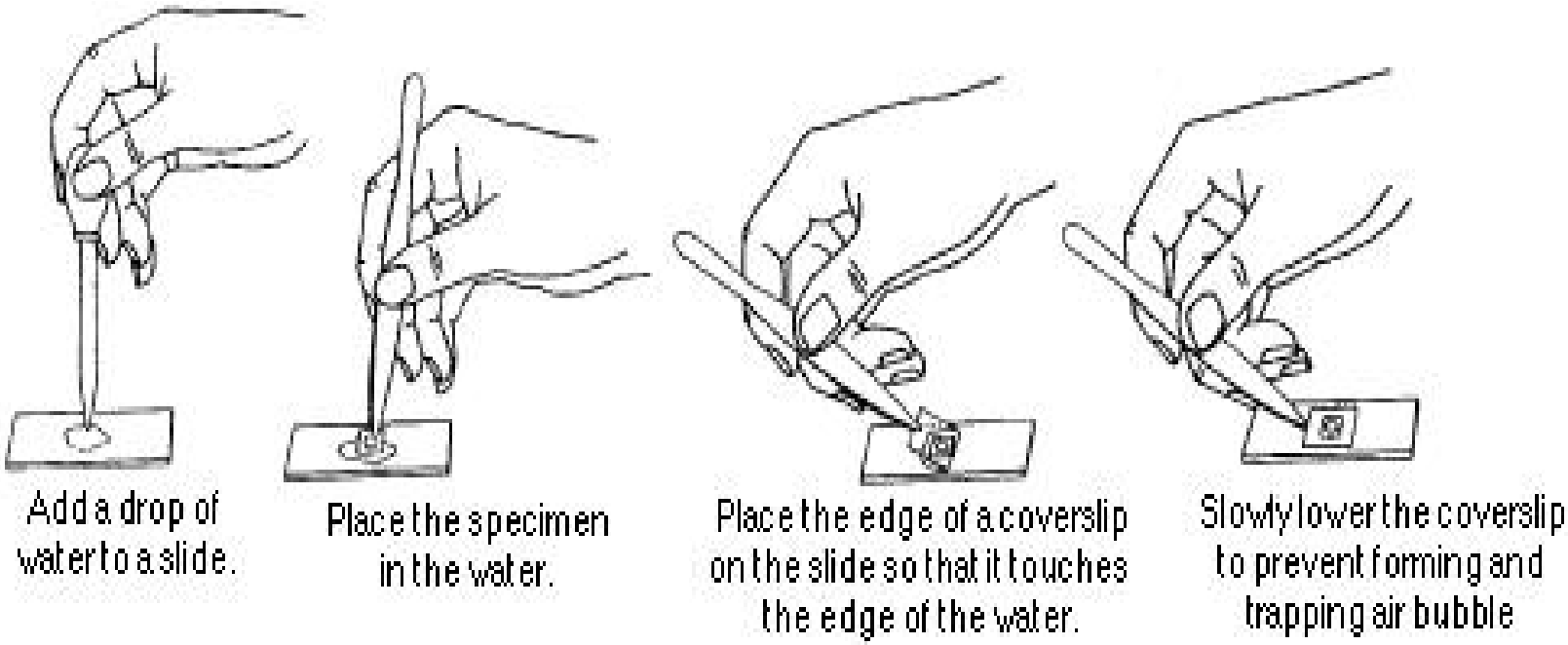
3- needle.

4-fungi sample.

To prepare the slide: (fungi)

- Place a drop of fluid in the center of the slide
- Position sample on liquid. (Cut a piece from the fungal sample and place it inside the water droplet on the slide).
- Place a cover slip over the water droplet and fungal sample. To do this right, place one side of the cover slip against the water droplet.
- Lower the cover slowly, avoiding air bubbles.
- Remove excess water with the paper towel (paper).

To prepare the slide: (fungi)



Staining Protocol and Concerns(bacteria):

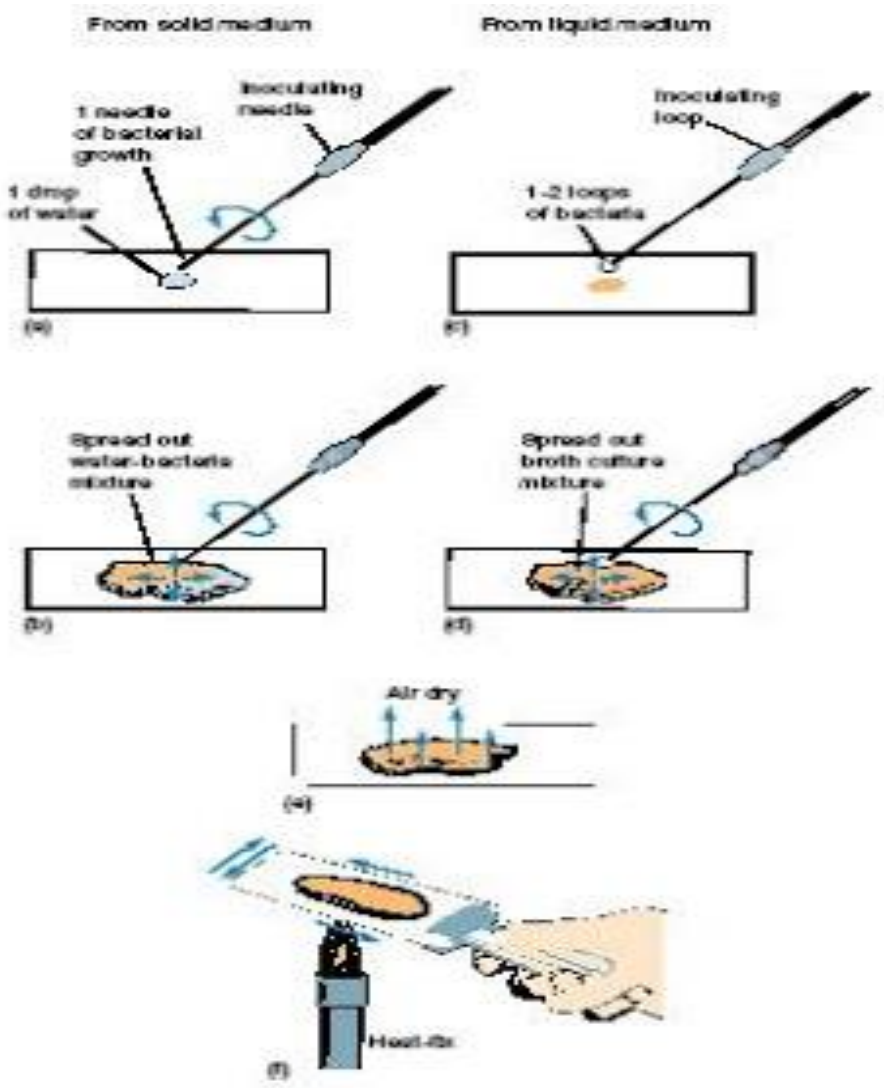
Reagents:

- Crystal violet (primary stain)
- Iodine solution/Gram's Iodine (mordant that fixes crystal violet to cell wall)
- Decolorizer (e.g. ethanol)
- Safranin (secondary stain)
- Water

Procedure

1. Make a slide of cell sample- Heat burner three times
2. crystal violet 1 minute - Rinse water for 5 seconds
3. iodine for 1 minute
4. Rinse alcohol for ~3 seconds and rinse with water.
5. Safranin for 1 minute Wash with water.

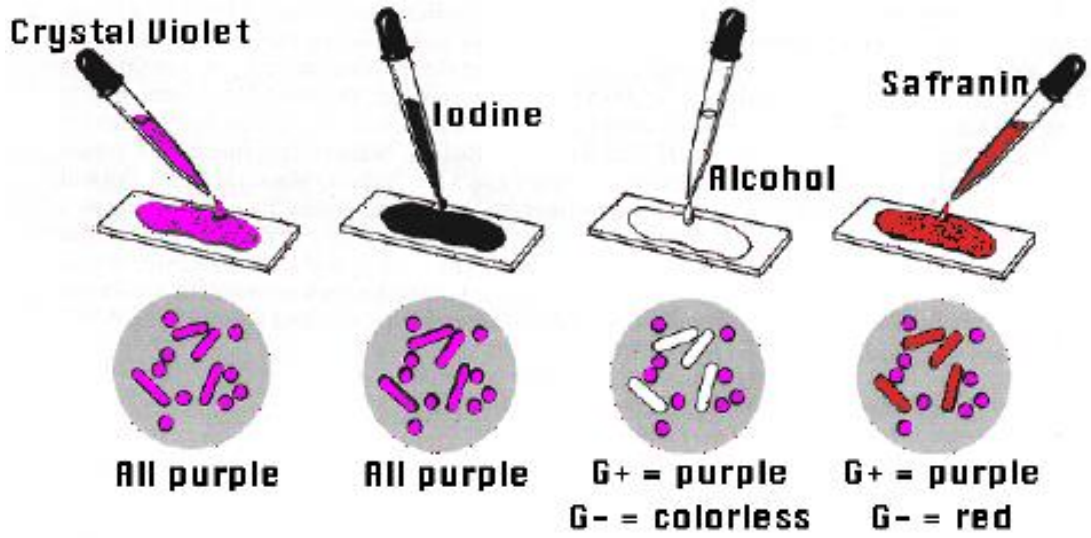
Preparing bacterial smear

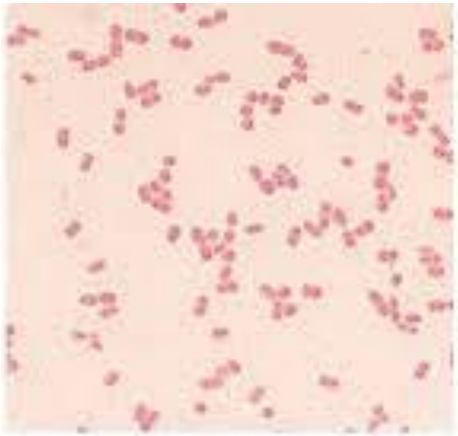


Gram staining – used for identifying bacteria.

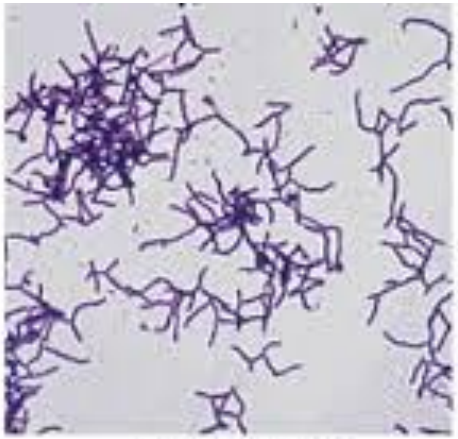
Composed from :

1- Crystal violet. 2- idodine. 3- Alcohol 95%. 4- Safranine

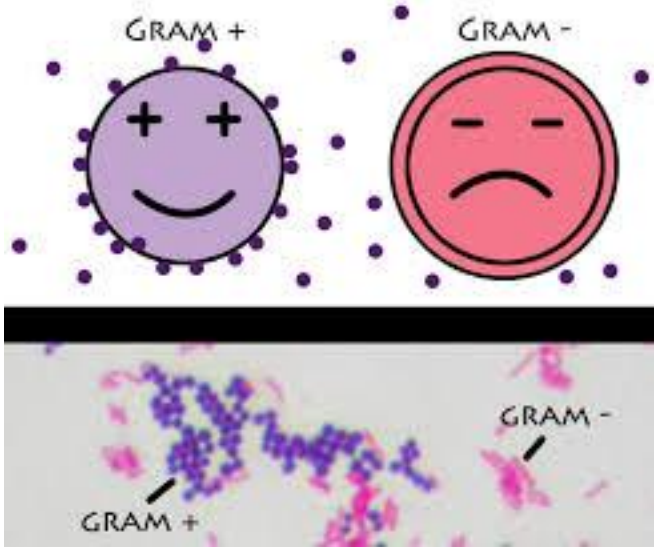




Gram Negative



Gram Positive



Wheat and barley diseases

A

B

C

Rust

1- Stem rust of wheat

DISEASE: Stem rust (black rust)

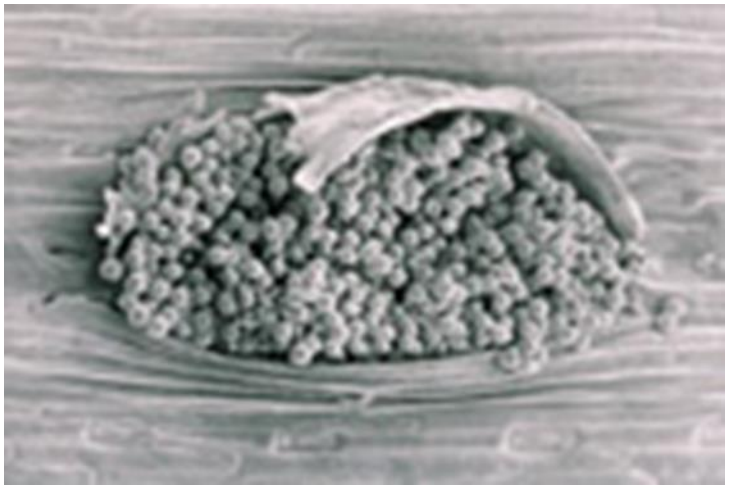
PATHOGEN: *Puccinia graminis* f. sp. *Tritici*

HOSTS: Wheat and barley, common barberry (and some additional *Berberis*)

Symptoms

Plants do not usually show obvious disease symptoms until 7 to 15 days after infection when the oval pustules (uredinia) of powdery, brick-red urediniospores break through the epidermis .

Microscopically, these red spores (uredinia) are covered with fine spines.



The pustules may be abundant and produced on both leaf surfaces and stems of hosts. Later in the season, pustules (telia) of black teliospores begin to appear in infected grass species

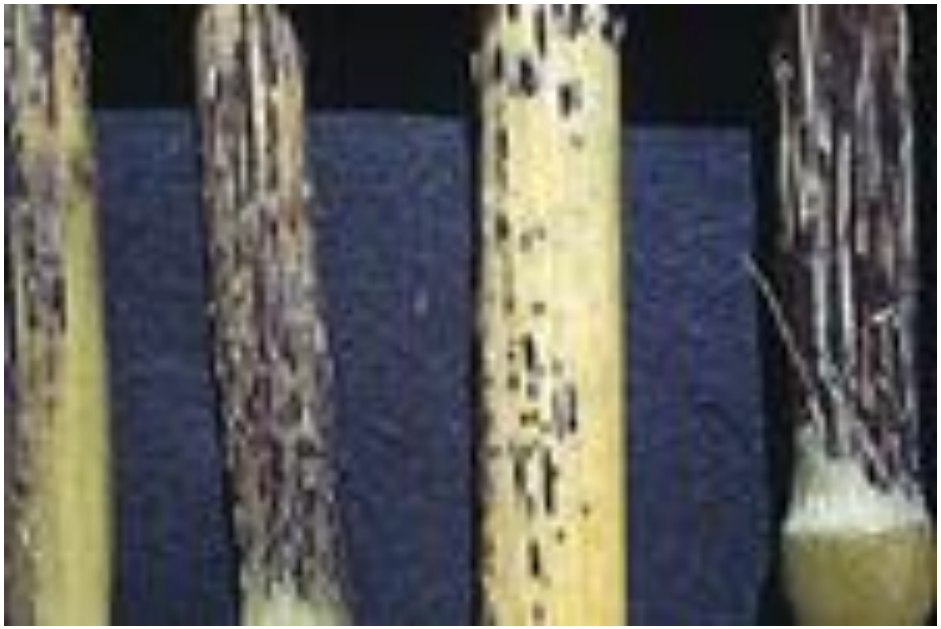
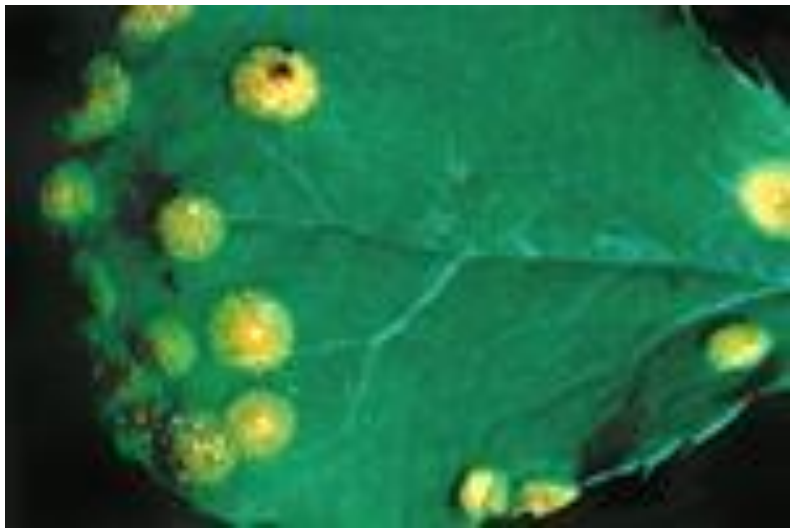


Figure 6

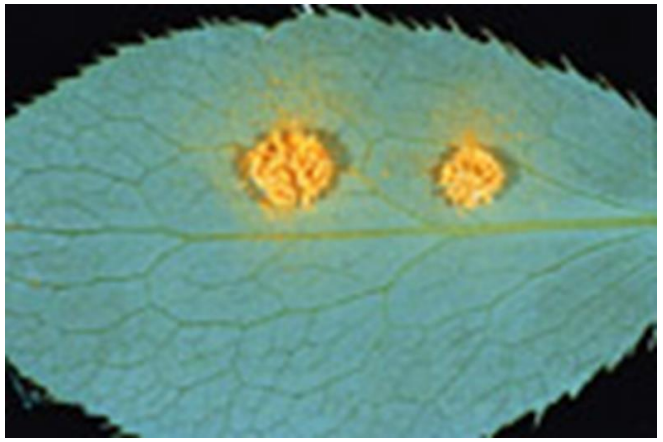
Microscopically, teliospores are two celled and thick walled .

In the spring, each teliospore germinates to produce thin-walled, colorless, haploid basidiospores Basidiospores infect the alternate hosts such as common barberry.

On barberry and other alternate hosts: Pycnia appear on barberry plants in the spring, usually in the upper leaf surfaces.



Five to 10 days later, cup-shaped structures filled with orange-yellow, powdery aeciospores break through the lower leaf surface The aecial cups are yellow and sometimes elongate to extend up to 5 mm from the leaf surface Microscopically, aeciospores have a slightly warty surface.



Puccinia graminis **is macrocyclic, producing all five spore stages**: -

-uredinio spores (uredospores)

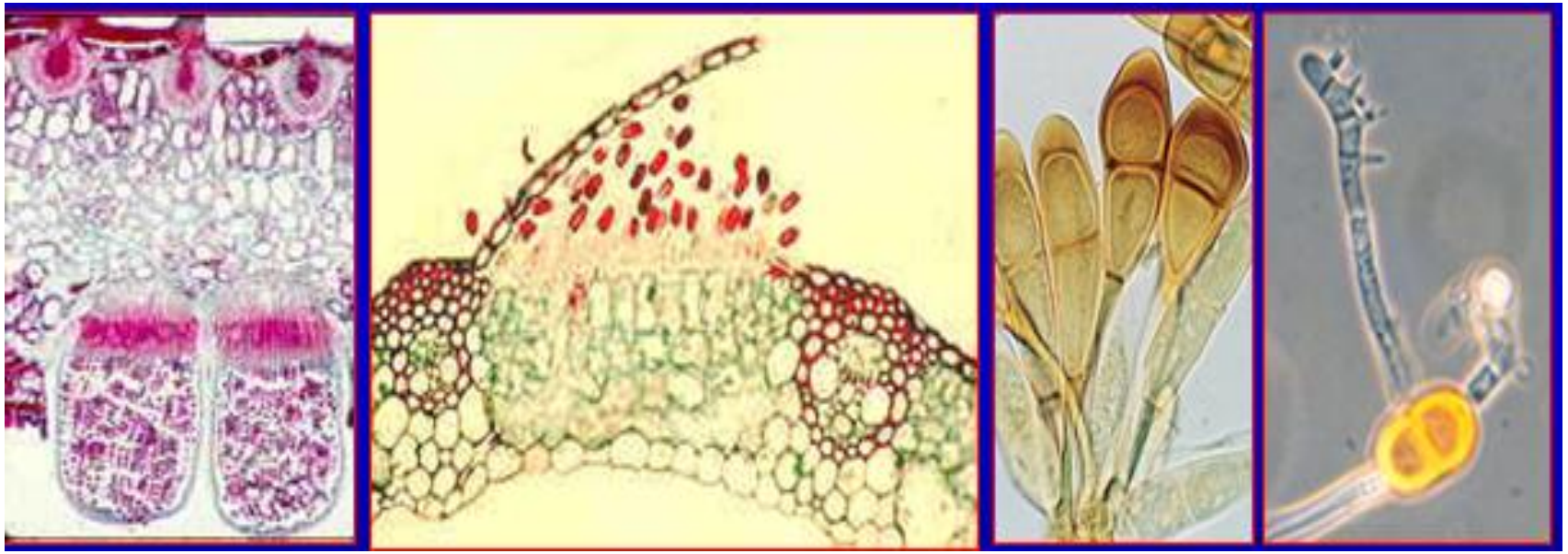
-telio spores.

basidio spores

-pycnio spores

- aeciospores

pycniospores



aeciospores

uredospores

teliospores.

basidiospores

2-leaf rust

Disease name: Leaf rust

Pathogen name:

Puccinia triticinia

Host: wheat

Leaf Rust:

(*Puccinia hordei*)

Host: barley

Symptoms:

1-Uredinia normally appear on the upper leaf surface, but with severe epidemis sheath infections can occur. 2-Uredinia are brown in color and generally circular in shape.

3- Stripe Rust

Yellow Rust or Stripe Rust (Puccinia striiformis) pustules in a line on wheat leaf surface

Cause

Stripe rust is caused by *Puccinia striiformis*

Hosts

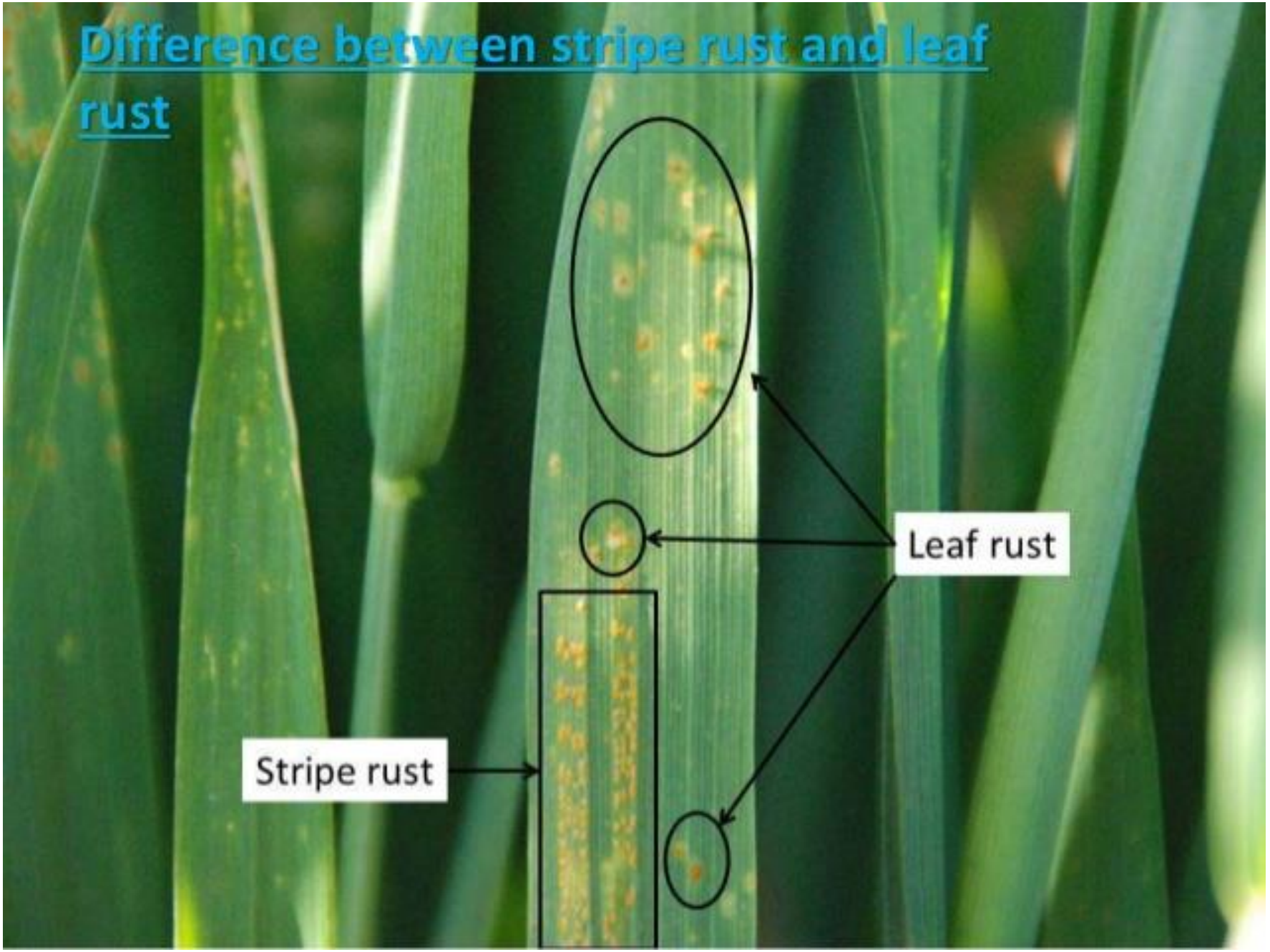
Wheat , barley and some perennial grasses may also become infected.

Symptoms

include yellow orange pustules oriented linearly between vascular bundles of leaves.

As the plants mature, the pustules turn dark and shiny as teliospores are formed.

Why Stripe rust symptoms usually appear earlier in the season than other rusts ? because the fungus develops at lower temperatures than the other rust fungi.


Difference between stripe rust and leaf rust
Leaf rust
Stripe rust