

Wheat Disease Identification and Control

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Objectives

- **To present detailed information on key identification symptoms of wheat diseases.**
- **To discuss control measures of the most important wheat disease.**
- **To present related research data for control.**

Scab (head blight)

Fusarium graminearum

- **Favored by warm, wet weather during and after flowering.**
- **Bleached heads or individual spikelets**
- **Superficial pink/orange mycelium/spores**
- **Bleached heads contain scabby seed (tombstones).**
- **Black lesions may be present at the base of the head.**

Scab





**Head Scab
caused by
the fungus
Fusarium spp.
(pink or orange
spore mass)**



Scab on wheat



Fusarium leaf spot

Wheat Scab Control

- **No resistant varieties**
- **Plant varieties that differ in flowering times**
- **Bury crop residue**
- **Chopping corn stalks down helps**
- **Crop rotation (not corn or grain sorghum)**
- **Foliar fungicides are not effective**

Foliar and Head Diseases

- **Glume Blotch** – *Stagonospora (Septoria) nodorum*. Found mostly on the lower leaves and then on the heads. Hard to scout for and fungus becomes more aggressive as heading occurs. Favored by frequent rains and mid-70s.
- **Symptoms** – On glume are chocolate-brown, with small, black pycnidia and are diagnostic as seed become mature. Grain may be extremely shriveled.



Leaf blotch

Septoria tritici



Glume blotch

Stagonospora nodorum

Glume Blotch





Leaf Blotch

Stagonospora leaf blotch with pycnidia



Use Resistant Varieties for Control of Leaf Rust and/or foliar fungicides

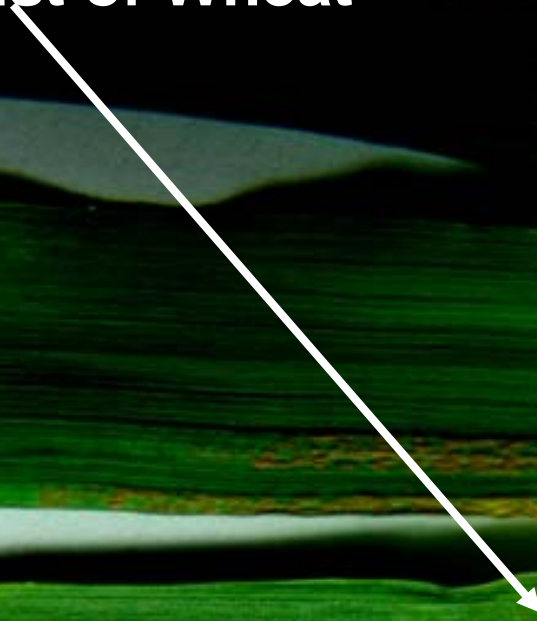
Stem rust

Puccinia graminis

Leaf rust

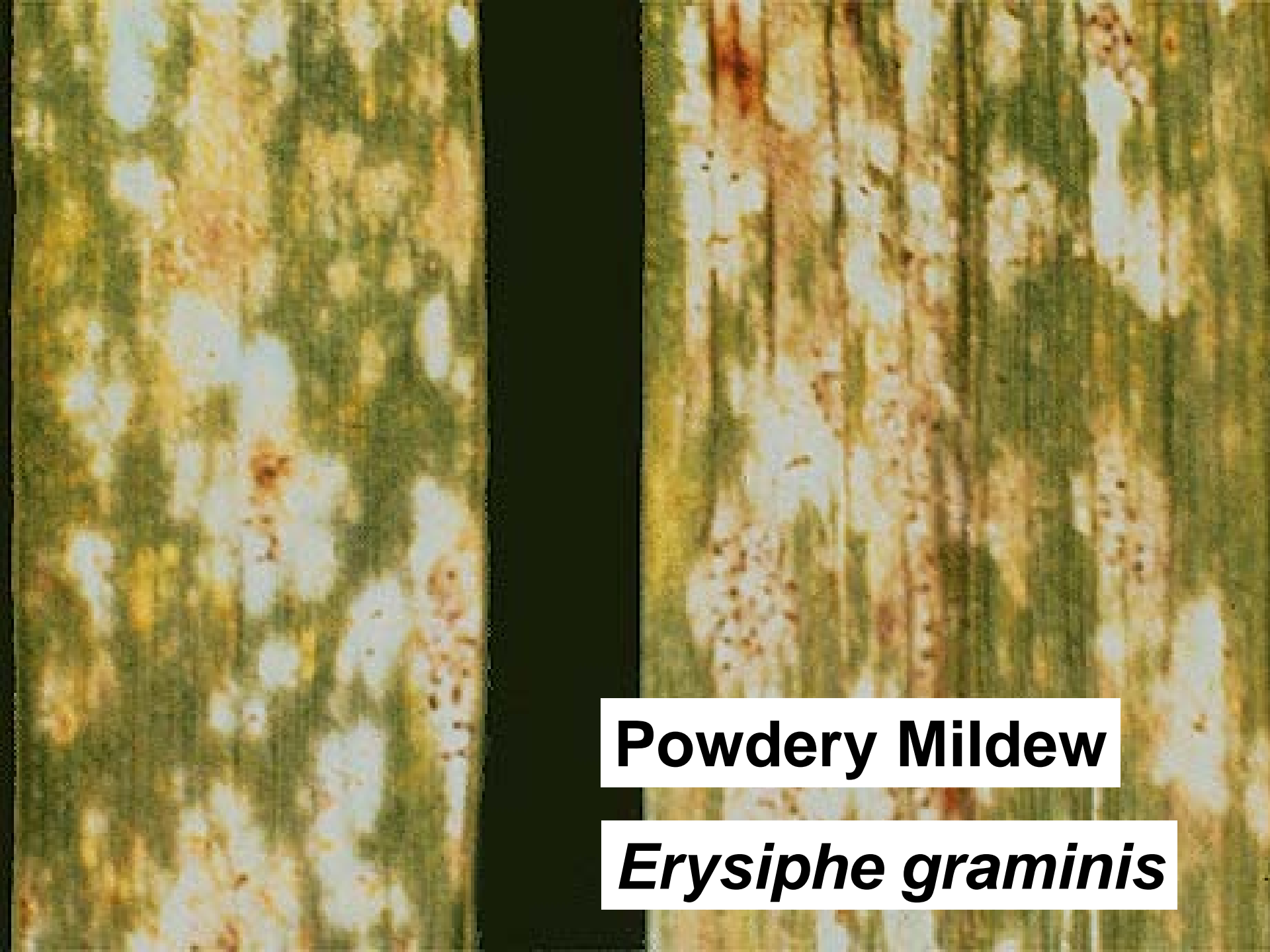
Puccinia recondita

Stripe Rust of Wheat



Stripe Rust

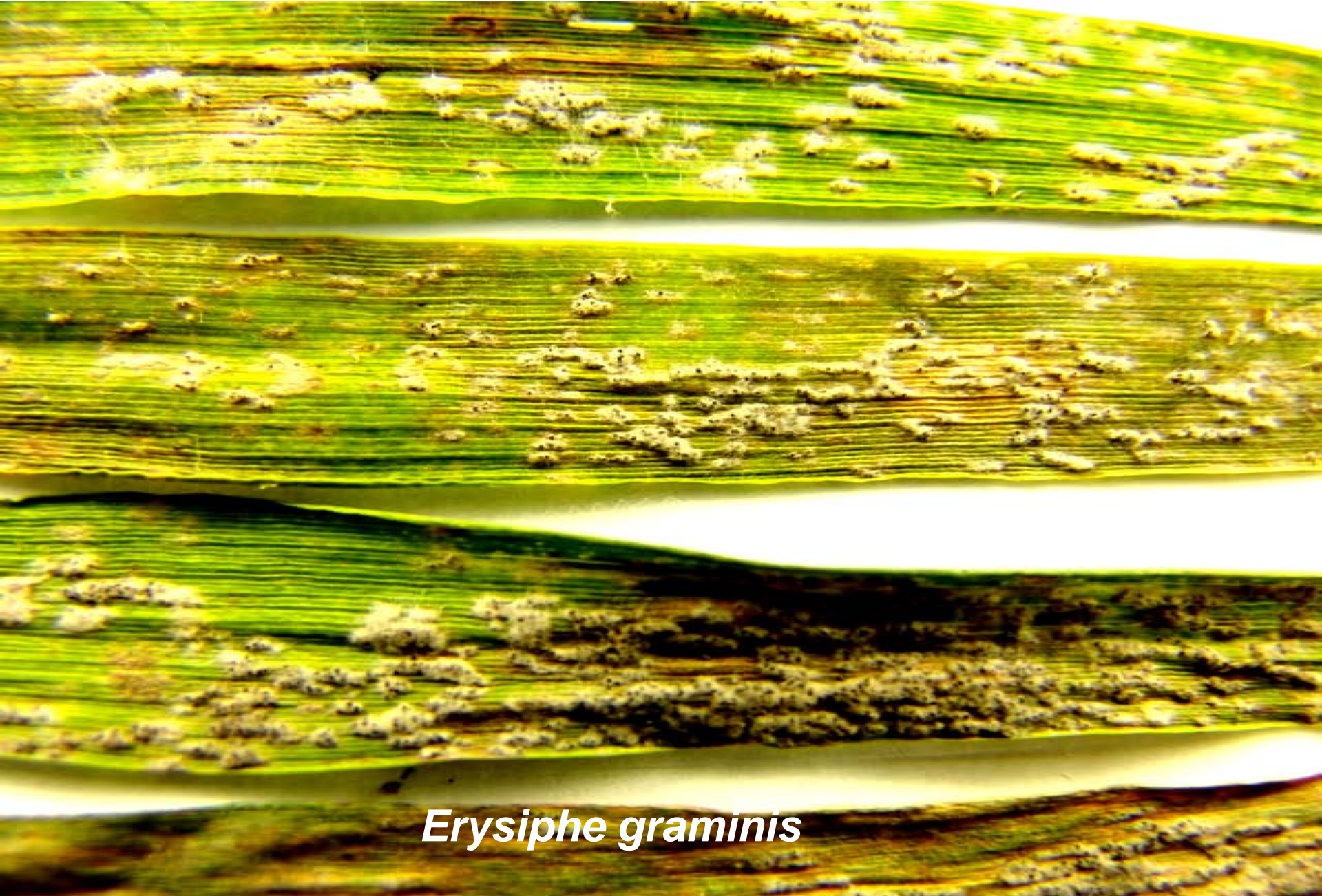
- Caused by Puccinia striiformis
- Symptoms appear early in the spring.
- Rust pustules are yellow and arranged into long conspicuous stripes.
- Spores are blown in from warmer areas.
- Disease development is most rapid under cool, wet weather.
- Varieties differ widely in susceptible.
- Fungicides (triazoles) are effective if applied before disease infects upper leaves.



Powdery Mildew

Erysiphe graminis

Powdery Mildew on Wheat



Erysiphe graminis

Foliar Disease Control in Wheat

- **Use foliar fungicides if appropriate**
- **Rotate crops**
- **Plow under old crop residue if appropriate**
- **Treat seed with fungicides**
- **Use tolerant varieties if available**



Take-all showing the white head symptom

This can be confused with head scab



**Take-all fungus
in young wheat
roots showing the
black root rot
Symptom.
Caused by:
*Gaeumannomyces
graminis***



Take-all

**Rotted stems &
roots**

Take-all

A close-up photograph of a plant root, likely from a grass, showing a network of fine, dark, branching hyphae (fungal threads) on its surface. The root itself is light brown and has a slightly textured appearance. The background is a solid, dark red color.

Dark hyphae in roots

Gaeumannomyces graminis

Take-All Disease Control

- **Later plantings are better**
- **Use Ammonium Nitrate**
- **Fertilize early**
- **Use higher rates of fertilizer**
- **Do not lime take-all infested soil**
- **Rotate with other crops, corn may produce scab in wheat**

Barley Yellow Dwarf Virus

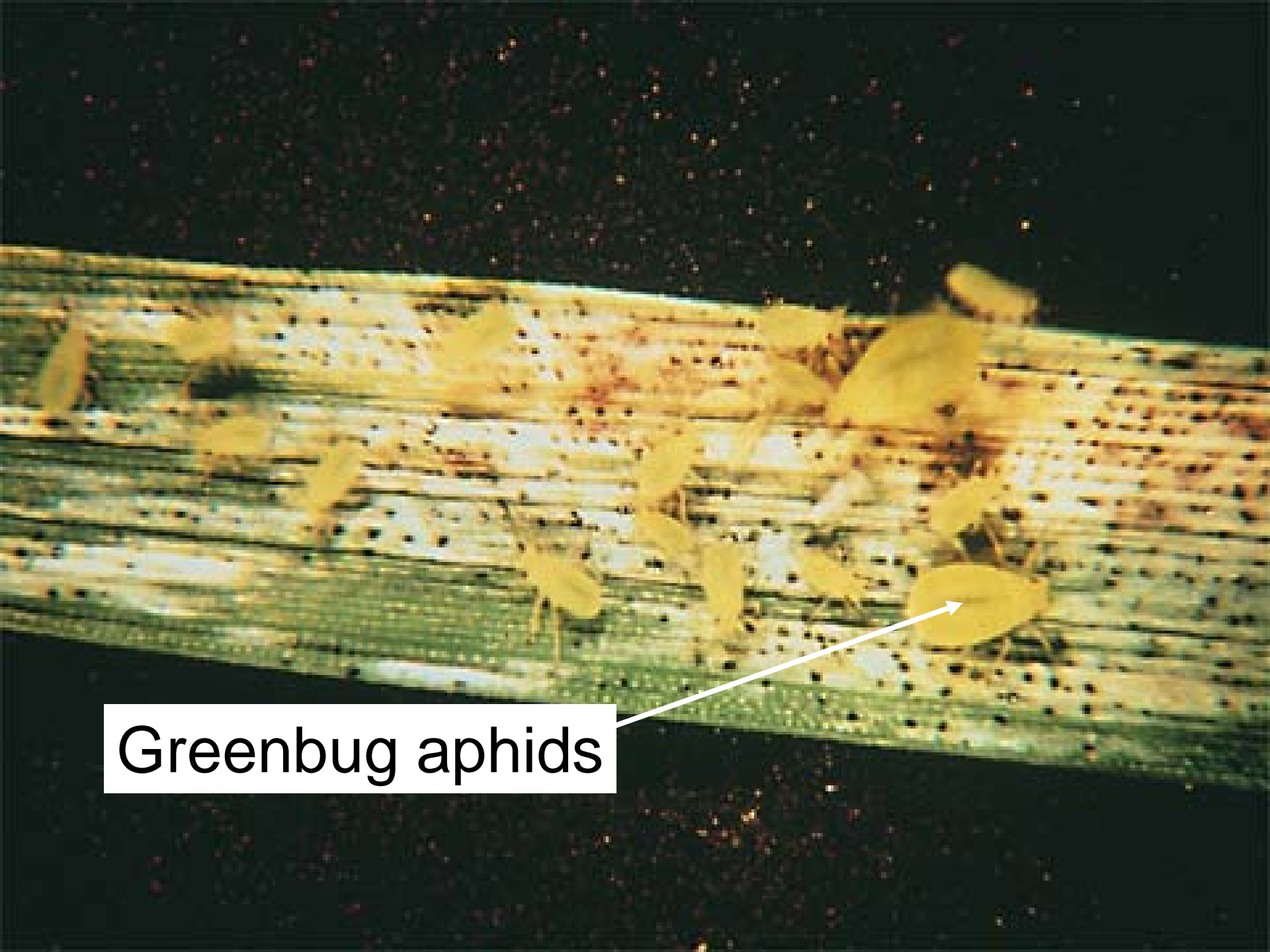
- **Transmitted by several species of aphids**
- **Fall infection causes the greater yield loss.**
- **Symptoms usually do not show up until spring.**
- **Symptoms: Stunted, poorly tillered across a field. Yellow, red or purple coloration of leaves after extended warm weather in April**

Barley Yellow Dwarf Virus





Barley Yellow Dwarf Virus



Greenbug aphids

BYDV CONTROL IN WHEAT

With seed treatments of Imidacloprid insecticide

WTES, Jackson, TN 1993-2001

Yields in bushels/acre

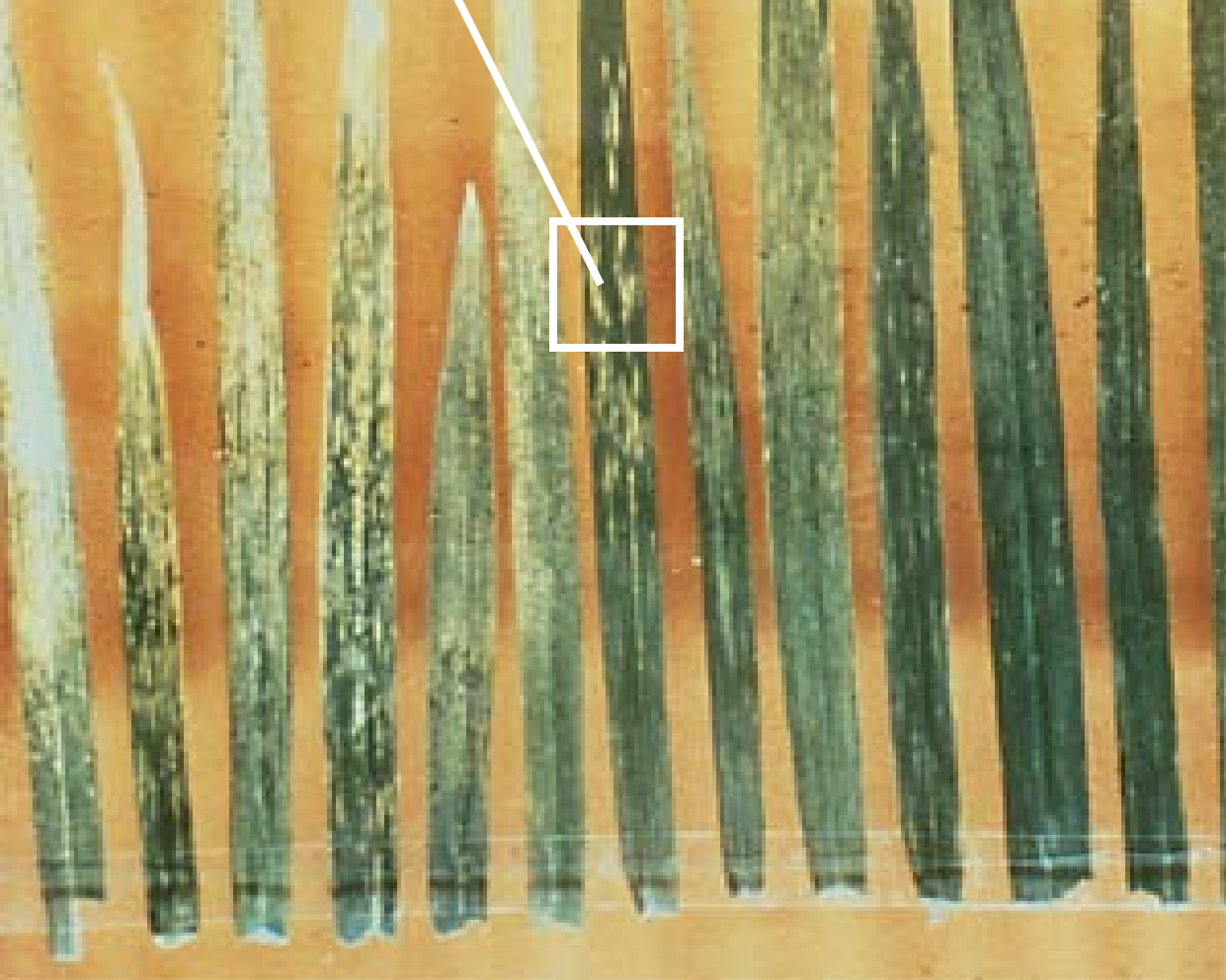
Gaucha 480 F	1993	1994	1995	1996	1997	1998	1999	2000	2001
Untreated	62	96	40	69	65	48	78	72	73
1.0 oz	66	99	44	68	59	60	78	75	80
1.5 oz	67	103	50	63	62	58	78	76	76
Increase 1.0 oz	4	3	4	0	0	12	0	3	7
Increase 1.5 oz	6	7	10	0	0	10	0	4	3

BYDV Control

- **Avoid early planting**
- **There are no resistant varieties**
- **Use insecticide to control fall aphids**



Curl mite



**Wheat Streak
Mosaic Virus
Spread by the
Wheat leaf curl
mite**



Wheat curl mite, vector of Wheat Streak Mosaic Virus

Control of WSMV

- **Control the Wheat Curl mite**
- **Break the “green bridge”**
- **Destroy volunteer wheat**
- **Burn down any grasses 2 weeks before planting wheat.**



Wheat Spindle Streak Virus (WSSV)

**Spread by the soil-borne
Fungus *Polymyxa graminis***

Control

**Use resistant varieties.
Damage is usually not
severe, especially when
temperatures stay above
65 F.**

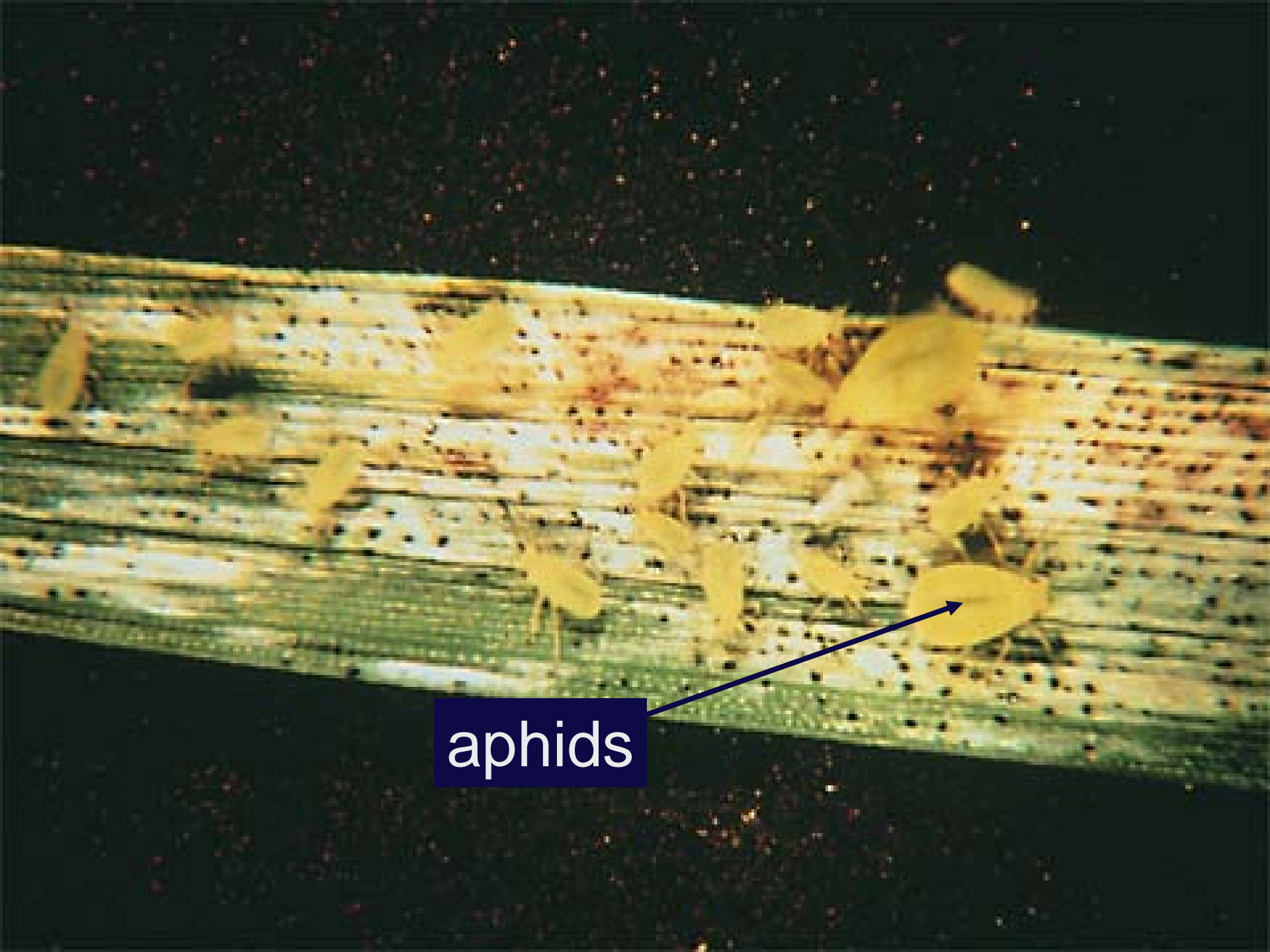
Seed Treatments for Disease Control in Wheat

Six Reasons to Treat Wheat Seed with a Fungicide

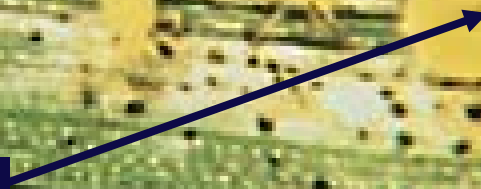
6. To reduce loose smut
5. To reduce powdery mildew
4. To reduce seedling disease
3. To increase germination
2. To reduce scab
1. To increase yield

Seed Treatment Fungicides

- ★ Seed rots & seedling diseases (*Rhizoctonia*, *Fusarium*): Charter (Triticonazole), captan, difenoconazole (Dividend), fludioxonil (Maxim), PCNB, tebuconazole (Raxil), thiram
- ★ Damping-off diseases (*Pythium* spp.): metalaxyl, mefenoxam
- ★ Smuts (loose smut): carboxin, difenoconazole, tebuconazole
- ★ A combination material is needed, especially for adverse planting conditions or no-till.



aphids



BARLEY YELLOW DWARF (BYD)

- ★ **SPREAD BY AT LEAST 20 APHIDS SPP.**
- ★ **MAJOR APHIDS: OAT BIRD-CHERRY, CORN LEAF, ENGLISH GRAIN, GREENBUG, AND RICE ROOT APHID**
- ★ **FIVE PROMINENT STRAINS OF BYDV: RMV, RPV, MAV, PAV, SGV**
- ★ **OVER 80 GRASS SPECIES ARE SUSCEPTIBLE.**

Why Should Aphids be Controlled in the Fall ?

- ★ Aphids carry the Barley Yellow Dwarf Virus (BYDV), and young seedlings are very susceptible.
- ★ Yield loss can be significant in some years.
- ★ Once aphids feed on young seedlings, it is too late to control BYD.
- ★ Scouting for aphids is difficult in the fall.

BYD CONTROL IN WHEAT

With seed treatments of imidacloprid (Gaucho) insecticide

A.Y. Chambers, WTES, Jackson, TN 1993-2001

Yields in bushels/acre; rate in ozs./cwt

Gaucho 480	1993	1994	1995	1996	1997	1998	1999	2000	2001
Untreated	62	96	40	69	65	48	78	72	73
1.0 oz	66	99	44	68	59	60	78	75	80
1.5 oz	67	103	50	63	62	58	78	76	76
Increase 1.0 oz	4	3	4	0	0	12	0	3	7
Increase 1.5 oz	6	7	10	0	0	10	0	4	3

BYD Control

- ✱ **Avoid early planting.**
- ✱ **There are no resistant varieties.**
- ✱ **Use insecticides to control fall aphids.**
- ✱ **Spring aphids do not cause as much damage.**

Summary of Wheat Disease Control Practices

- **Plant after Oct. 15.**
- **Use recommended resistant varieties.**
- **Treat seed with fungicide and insecticide to control aphids in the fall.**
- **Wheat after corn may provide inoculum for scab**
- **Do not lime Take-All infected fields, acid soils have less Take-All.**
- **Burn down any “green bridge” 2 weeks before planting.**
- **Treat with foliar fungicides when wheat prices and disease conditions warrant their use.**