

April 23, 2012 – Wheat

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Causes of White-Heads in Wheat

Freeze damage - Directly to head (spike)

Temperatures below freezing during late jointing through the early heading stage are a major cause of white heads. The intensity and duration of freezing weather before and during flowering can result in sterility of all or parts of the spike. The anthers, which are the male floral parts that contribute pollen to initiate seed development, are particularly sensitive to cold temperatures. The damaged head or spike can be completely or only partially sterile, with white or straw coloring appearing a few days after a freeze. Partially white heads will occur if a light freeze occurs just prior to or during flowering. Damage depends on the progress of flowering at the time of the freeze (3 to 4-day period), and the affected portion can be at the tip, base or even the middle of the wheat head. Normally, freeze damage will be more severe in low areas of a field.

Freeze damage - Stem injury A sudden freeze can form ice in wheat vascular tissue, expanding and destroying xylem vessels which conduct water in the stem. Damage to the stem can occur anytime after jointing and can lead to white heads. Commonly a “frost ring” or white ring of damaged stem tissue can appear on the stem or peduncle which supports the wheat head. If damage is severe, stems will be split, discolored or lack rigidity. Often stems will be crooked at a lower joint. Less severe freeze damage may exhibit little or no visual injury symptoms; however, vascular tissue may be damaged. Lodging will be increased in fields with stem injury. White heads result when not enough water and nutrients are able to pass through the vascular system to the developing head.

Stem maggot - Damage from this insect used to be relatively common, but has been rare in recent years. White heads caused by this insect will be scattered throughout a field. Wheat stem maggot injury is almost always isolated, with random heads affected across a field. The white head along with the stem (peduncle) supporting it can be easily pulled from the leaf sheath of the plant. Insect damage from the maggot either entirely detaches the peduncle or severely damages it, causing it to detach readily, with the entire peduncle above the damage turning white.

Hail - Severe damage from hail is obvious. However, very light hail storms can cause damage directly to the wheat head or stem. The stem may not necessarily be broken over. Look for bruises on the upper stem below the white head.

Dryland root rot - In some years this can be quiet common in some areas of the state. Usually all of the tillers of an infected plant will prematurely turn white. These plants will also usually be stunted and the white heads will be present in patches in the field. This disease will occur more often in years with drought. The plants can be easily pulled up due to root damage. The base of the stem just above the ground surface along with the crown will be chocolate brown or possibly pink. This is visible when all of the leaf sheaths are pulled back to expose the lower stem. Dryland root rot is primarily a problem in continuous wheat and will tend to appear in the same location in the field and worsen over time.

Take-all root rot - Large areas in the field will die prematurely and turn white due to this

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soil borne fungus. Plants are normally stunted in the infected areas. This disease is most common in continuous irrigated no-till wheat. White heads will usually be small. The base of the stem as well as the crown will be a shiny black color. Yield loss will be severe in the infected areas.

Drought - When drought is coupled with very hot temperature the wheat plant can die quickly resulting in white heads. Rather than single tillers, the entire plant will usually be affected.

Drowning - If plant roots are saturated for 3 to 4 days, the whole plant can die and turn white.

Scab - Not a common disease in Texas. When this disease occurs it is primarily in no-till irrigated wheat planted into corn stubble. When heads are closely examined, they will have a pink color at the base of the spikelet or glumes. White heads will be tillers scattered throughout the field.

Sharp eyespot - This disease occurs in Kansas, but is not often found in Texas. Look for white to pale lesions with dark brown margins on the lower stems.

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***This article as well as others
relating to cotton, peanuts, and
sorghum crops can be found on
our website, terry-tx.tamu.edu.***