

Rating Wheat Varieties for Hessian Fly Resistance at McGregor, Thrall and Lindsey TX, 2017-2018.

David Drake and Allen Knutson
 Texas A&M AgriLife Extension

Summary: The relative resistance to Hessian fly was rated among 36 hard red winter wheat varieties grown in one or more of three replicated trials at Lindsey (Cooke County), Thrall (Texas A&M Stiles Farm) and McGregor (Texas A&M AgriLife Farm) TX as part of the Texas A&M AgriLife Wheat Variety Evaluation Program. Five varieties, TAM 304, TAM 204, SY Flint, SY Razor and Gallagher were rated as resistant in two or more trials. Other entries were also rated as resistant but were planted in only one of the trials.

Objectives: Hessian fly is an occasional insect pest of wheat in the Texas Blacklands. Loss of stand and yield can occur when the same variety is planted every year over a large area or when susceptible varieties are planted early. Once plants are infested with Hessian fly larvae, there are no means of killing the larvae to avoid crop loss. The risk of Hessian fly infestation can be reduced by delayed planting to escape early fall infestations and the planting of wheat varieties with resistance to Hessian fly. However, the resistance to Hessian fly of new varieties is often unknown. Also, resistance may vary geographically depending on local Hessian fly biotypes and as virulent biotypes become more common over time. The objectives of this study were to compare Hessian fly infestations among wheat varieties and identify those varieties with resistance to Hessian fly in the Texas Blacklands.

Methods and Materials: Wheat varieties were planted in replicated field plots at Lindsey (Cooke County), Thrall (Williamson County, Texas A&M Stiles Farm) and McGregor (McLennan County, Texas A&M AgriLife Farm) TX as part of the Texas A&M AgriLife Wheat Variety Evaluation Program. Hessian fly infestations were sampled by collecting wheat plants at harvest from each of two (McGregor and Lindsey) or three (Thrall) replications (plots) for each variety. Samples were returned to the lab and all the tillers from five plants from each plot were examined for Hessian fly puparia. The number of Hessian fly per plant and the number of tillers per plant were recorded and the average number of Hessian fly puparia per tiller was calculated.

Results and Discussion: The average number of Hessian fly puparia per tiller for each variety is shown in the three Figures. The Hessian fly infestation at this site was high, averaging 2-3 per tiller for the most susceptible varieties. Little Hessian fly damage (stunted tillers, lodging) was evident at harvest.

There are no uniform guidelines for classifying varieties as resistant, moderately susceptible or susceptible to Hessian fly. For this study, the following arbitrary classification was

used: varieties with an average of up to 0.3 HF per tiller = Resistant, varieties with 0.31-0.99 HF per tiller = Moderately Susceptible and varieties averaging one or more HF per tiller = Susceptible. These ratings are shown in Table 1. Current rating refers to those listed in the table “Hard, Red Winter Wheat Characteristics” found in the annual wheat variety trials results at <http://varietytesting.tamu.edu/wheat>.

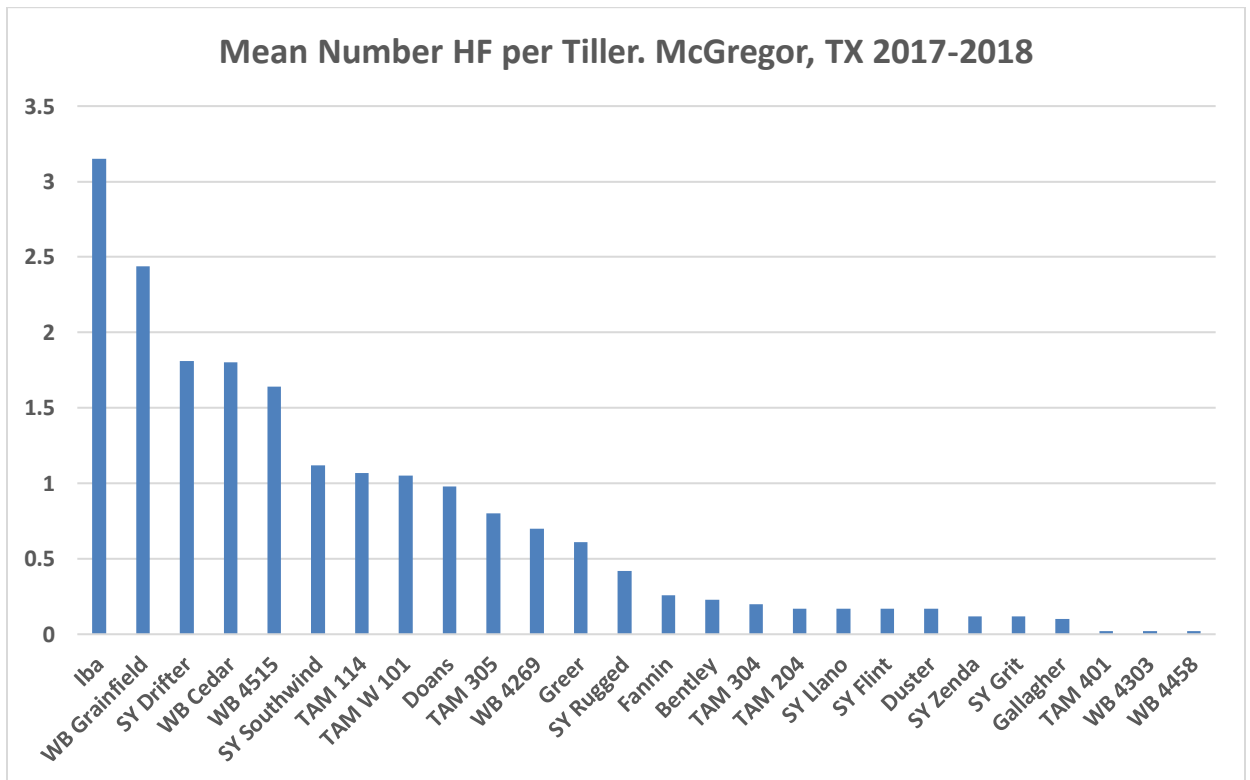
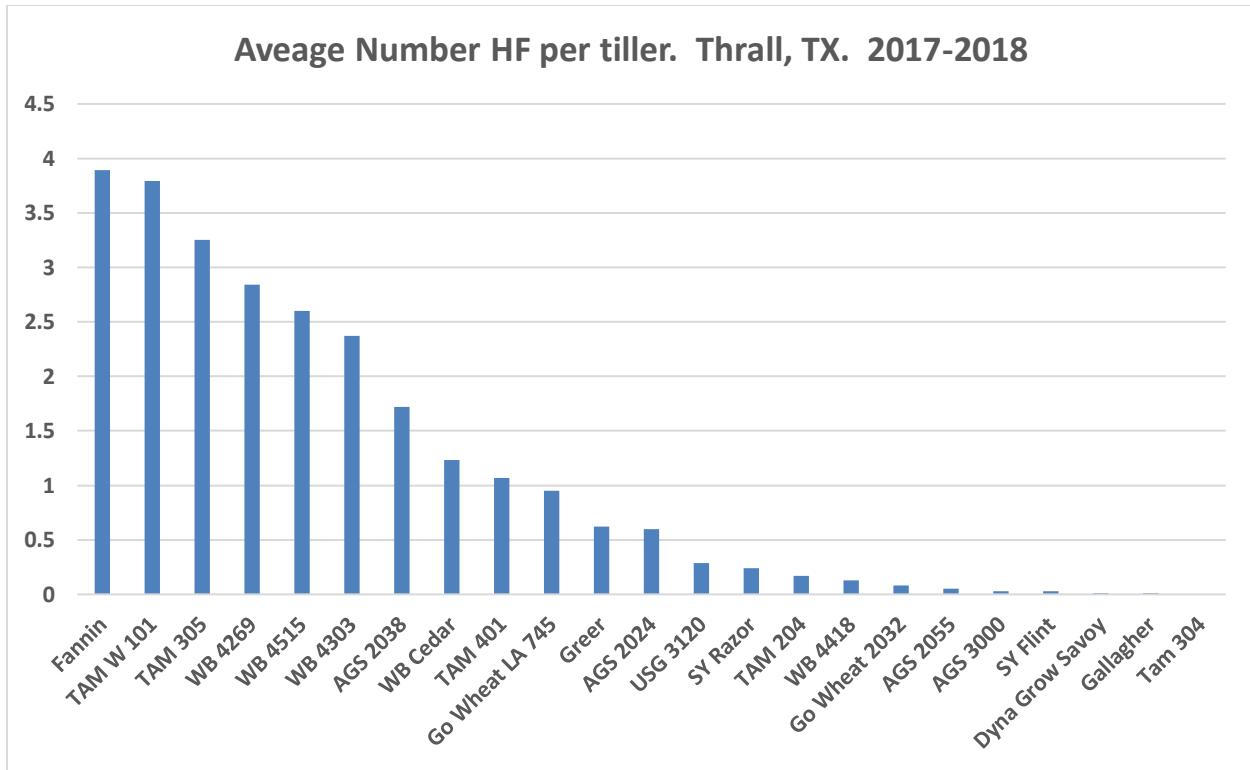
Five varieties, TAM 304, TAM 204, SY Flint, SY Razor and Gallagher were rated as resistant in two or more trials. Other entries were also rated as resistant but were planted in only one of the trials. Thus, additional studies are needed.

The rating for most varieties was consistent with the current ratings based upon previous years of evaluation at sites in the Blacklands. Three exceptions are noted. First, Fannin was rated susceptible at McGregor but resistant at the two other locations and is currently considered moderately susceptible. Secondly, Bentley was ranked resistant at McGregor but is currently rated as susceptible and WB 4458 was rated resistant in these trials but is currently rated susceptible. Additional trials are needed to reconcile these results.

Hessian fly resistance in wheat can vary across regions depending on what biotypes are present locally. Also, resistance may no longer be effective if local biotypes virulent to that resistance increase in an area. Thus, the resistance level of varieties can decline over time.

Yields results for these varieties are reported in the 2018 Texas Wheat Variety Trial Results on-line at <http://varietytesting.tamu.edu/wheat>.

Acknowledgements: Thanks to Clark Neely and the Texas Wheat Uniform Variety Trial team and to Russel Sutton, Texas A&M AgriLife, for their assistance with this project. Also, thanks to the producer who provided the field site and assistance with the Cooke County trial.



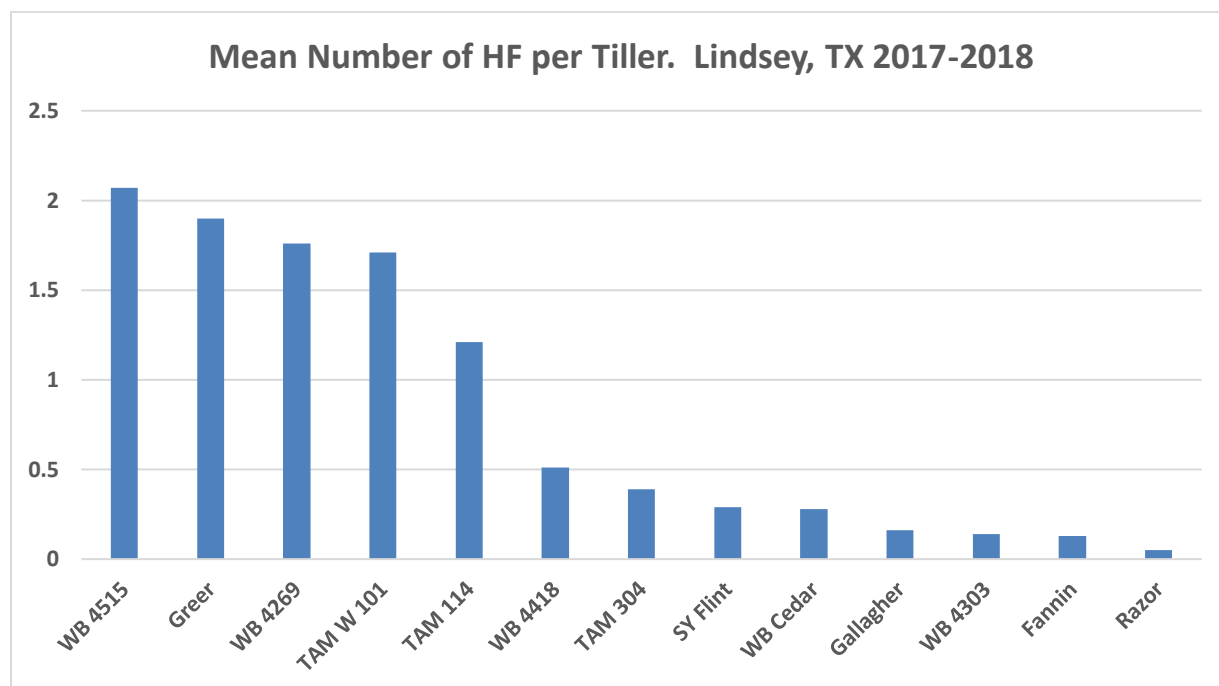


Table. Hessian fly ratings for three trials during 2017-2018. Arbitrary classification based on finding up to 0.3 HF per tiller = Resistant, 0.31-0.99 HF per tiller = Moderately Susceptible and one or more HF per tiller = Susceptible. Current rating refers to published Table in annual wheat variety trials results.

Variety	Thrall	McGregor	Lindsey	Rating this Study	Current Rating*
Iba		S		S	MS
WB Grainfield		S		S	S
SY Drifter		S		S	S
WB Cedar	S	S	R	S	MS
WB 4515	S	S	S	S	--
SY Southwind		S		S	--
TAM 114		S	S	S	MS
TAM W 101	S	S	S	S	S
Doans		MS		MS	--
TAM 305	S	MS		S	S
WB 4269	S	MS	S	S	--
Greer	MS	MS	S	MS	--
SY Rugged		MS		MS	--
Fannin	S	R	R	?	MS
Bentley		R		?	S

TAM 304	R	R	MR	R	R
TAM 204	R	R		R	R
SY Llano		R		R	--
SY Flint	R	R	R	R	--
Duster		R		R	R
Zenda		R		R	--
SY Razor	R		R	R	R
SY Grit		R		R	--
Gallagher	R	R	R	R	R
TAM 401	S	R		?	MS
WB 4303	S	R	R	?	--
WB 4458		R		?	S
WB 4418	R		MS	?	--
USG 3120	R			R	--
AGS 2024	MS			MS	--
AGS 2018	S			S	--
AGS 2055	R			R	--
AGS 3000	R			R	--
Dyna Gro Savoy	R			R	--
Go Wheat LA 745	MS			MS	--
Go Wheat 2031	R			R	--