2011 Wheat Projects at the North Plains Research Farm
Conducted by the TAM Wheat Improvement Program

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Based on 2011 Agricultural Statistical Service surveys (2010 for Texas since a survey was not conducted in 2011), TAM 111 and TAM 112 are the most popular cultivars in Texas and Western Kansas. TAM 111 is the number one variety grown in Texas and Kansas and is third in popularity in Colorado and Nebraska. Almost 4 million acres of TAM varieties are planted in the southern Great Plains, accounting for 16.5% of the total acreage.

TAM 113 was approved for release this year and licensed to Adaptive Genetics. Certified seed is currently being produced and will be available for sell in Fall 2012. TAM 113 has a similar area of adaptation and grain yield potential as TAM 111 and TAM 112. However, compared to TAM 111, it has better leaf rust resistance and better bread-baking quality; and compared to TAM 112, it has better leaf and stripe rust resistance. TAM 113, with better milling and baking characteristics and resistance to leaf, stripe, and stem rust, will provide a good complement to other hard red winter wheat cultivars for wheat producers in the Southern Great Plains.

Figure 1. Dr. Jackie Rudd (wheat breeder) and Dr. Shuyu Liu (wheat geneticist) compare notes in front of the irrigated nursery.

The NPRF has been a valuable High Plains location for breeding and testing by the TAM wheat breeding program. A total of 4111 individual wheat plots (Table 1) involving 1094 hours of labor were planted, evaluated, harvested, and processed in 2011.

Table 1. Environments, number of plots, and type of experiments conducted by the TAM Wheat Improvement Program at the NPRF in 2011.		
Environments	Plots	Experiments
Dryland plots (1 pre-irrigation)	671	Preliminary, advanced, elite, varieties.
Linear irrigated	1100	Preliminary, advanced, elite, varieties.
40% PET Pivot irrigated	468	Drought tolerance and irrigation response trials.
50% PET Pivot irrigated	468	Drought tolerance and irrigation response trials.
65 % PET Pivot irrigated	468	Drought tolerance and irrigation response trials.
75% PET Pivot irrigated	468	Drought tolerance and irrigation response trials.
100% PET Pivot irrigated	468	Drought tolerance and irrigation response trials.

A new research project to study drought tolerance was initiated in 2011. Genetic and physiological studies to elucidate drought tolerance mechanisms in wheat were conducted under 5 different water levels in addition to the standard irrigation and dryland environments. This is a joint research project by the wheat breeding, wheat genetics, and crop physiology programs. Yield data from the first year of this 5-year study are shown in Table 2. TAM 112 and TAM 113 were the top yielding varieties when averaged across all water regimes. An understanding of how different wheat varieties respond to the various water levels will help breeders to accelerate the development of improved drought tolerant wheat.

Table 2. Grain yield (bu/a) of popular High Plains wheat varieties grown under 7 different environments at the NPRF in 2011.							
NAME	40% PET	50% PET	65% PET	75% PET	100% PET	Standard Dryland (1 pre irr)	Standard linear Irrigated
TAM W-101	10	9	16	43	58	13	51
TAM 111	10	10	20	50	69	10	57
TAM 112	10	17	23	52	73	16	59
TAM 113	8	11	24	56	74	19	59
Jagalene	10	10	17	48	68	15	47
Hatcher	7	11	21	51	67	13	58
Bill Brown	10	10	21	49	59	9	55
Winterhawk	10	12	21	46	66	14	57
Endurance	9	9	17	48	54	13	49
Duster	9	9	19	57	71	10	54
Billings	10	8	18	50	70	11	54
Jagger	12	13	15	41	57	13	41
Fuller	9	8	18	42	62	15	44

Figure 2. The wheat plots under the pivot were planted into heavy corn residue.

Figure 3. Yield component samples were taken before harvest of the 50% PET irrigated plots.