

## 1998 Collaborative On-Farm Testing Results

*Jerry J. Johnson and Jessica G. Davis*

In the fall of 1997, eastern Colorado wheat producers planted twenty-three collaborative on-farm tests in Baca, Prowers, Kiowa, Cheyenne, Kit Carson, Adams, Arapahoe, Washington, and Weld counties. The objective was to compare the performance of the newly-released, Russian Wheat Aphid-resistant varieties; Halt, Prowers, and Yumar, with the performance of Colorado's most popular, but susceptible variety, TAM 107. The varieties were planted by the collaborating growers in long, side-by-side, strips. Most producers planted additional varieties, e.g., Akron, beside the test strips.

Most of Colorado had good fall seeding conditions that led to good plant stands. However, parts of Adams, Arapahoe, Washington and Lincoln counties suffered from dry fall planting conditions and dry spring growing conditions as well. The October blizzard provided late fall moisture and resulted in the disappearance of Russian wheat aphids and mites. Without the wheat curl mite, there was little or no wheat streak mosaic disease.

The results below reflect the yield potential of the Russian wheat aphid resistant varieties without any aphid pressure. Note that not all varieties were planted in all locations (see Table 1). Table 2 summarizes average yield performance over the maximum number of test results with common varieties, e.g., 19 tests with Halt, TAM 107, and Prowers. As in previous years without Russian wheat aphid, Halt and TAM 107 yields were very similar. The average Prowers yield was 5 bu/ac lower than TAM 107 but many of the tests were conducted in locations where Prowers (and parent Lamar) would not be recommended for use. The average performance of Yumar was similar to Halt and TAM 107 without any RWA pressure and is expected to be significantly better than TAM 107 if RWA were present.

New in 1997/98 were four locations where each variety was planted twice, once with phosphate fertilizer, and once without. See Tables 3-5 for results.

**Table 1. 1998 collaborative on-farm test results.**

Test County and Description	Variety			
	Halt	Prowers	TAM 107	Yumar
	bu/ac	bu/ac	bu/ac	bu/ac
Baca SE	28.7	32.9	32.9	----
Baca SC	23.4	20.2	19.5	----
Baca WC	26.6	28.9	29.7	25.6
Baca EC	51.4	48.7	57.7	53.5
Baca NC	64.8	66.2	64.5	----
Prowers NE1	41.0	46.7	49.2	43.8
Prowers NC	37.8	42.0	42.6	----
Prowers NE2	55.9	49.7	51.8	----
Kiowa NE	54.3	47.1	55.2	53.7
Cheyenne NC	50.8	47.3	59.6	44.7
Cheyenne NE	43.3	39.0	45.1	47.7
Lincoln WC	28.6	17.0	27.0	27.6
Lincoln NC	36.9	46.4	40.8	41.3
Kit Carson NC	67.8	48.8	69.1	64.8
Washington SW	37.1	31.9	36.8	32.8
Adams SE	16.7	14.0	13.2	11.6
Adams CE	23.2	21.9	24.3	25.1
Weld SC	30.3	26.2	32.4	27.8
Weld NE	30.8	41.0	34.1	31.8
Weld NW	22.4	16.1	----	18.3

**Table 2. Average variety performance over locations.**

Group of tests with common varieties	Variety			
	Halt	Prowers	TAM 107	Yumar
	bu/ac	bu/ac	bu/ac	bu/ac
19 tests: Halt, Prowers, TAM 107	39.4	37.7	41.3	----
14 tests: Halt, Prowers, TAM 107, Yumar	38.5	36.1	41.0	38.0

### Phosphorus On-Farm Tests

On four of the collaborative on-farm test sites (COFT), we compared phosphorus fertilizer application (based on CSU soil test recommendations) with no phosphorus fertilizer for each of the four test varieties. Three of the sites tested Low in phosphorus, and one tested Medium (Table 3). The Low testing sites have a high probability of getting a yield response to P fertilizer, and the Medium site has a moderate probability of yield increase.

**Table 3. Soil test P levels and P fertilizer recommendations.**

Test Location	Sodium Bicarb Soil Test P (ppm)	Application Rate (lb P <sub>2</sub> O <sub>5</sub> /A)
Baca	4 (Low)	40
Lincoln	8 (Medium)	20
Morgan	4 (Low)	40
Prowers	4 (Low)	40

We used 18-46-0 (DAP) to supply P except at the Baca County site where 10-34-0 was used. In all cases, a small amount of N was applied with the P fertilizer, in addition to any farmer applied N. Yields were significantly increased for all four varieties with an average yield increase of four bushels per acre (Table 4).

**Table 4. Impact of P fertilizer on wheat yields.**

Variety	With P Fertilizer (bu/ac)	Without P Fertilizer (bu/ac)	Increase (bu/ac)
Halt	34	30	4
Prowers	38	34	4
TAM 107	38	34	4
Yuma	37	31	6
<b>Average</b>	<b>36</b>	<b>32</b>	<b>4</b>

The fertilizer cost varied with the application rate and product used (\$280/ton for 10-34-0 and \$310/ton for 18-46-0). With the wheat price as low as it is this year, the yield increases due to P fertilizer were generally not enough to pay for the additional fertilizer (Table 5). On average across these test sites, a wheat price of \$3.22/bu

would be just enough to pay for the fertilizer without paying for the spreading costs (fuel, labor, etc.). However, there are additional benefits due to P fertilizer such as the additional N which reduces N fertilizer costs and the improved weed competition and subsequent reduction in herbicide costs. These benefits were not factored into these calculations. Each farmer should weigh the costs and benefits of P fertilizer for their own conditions (soil fertility, weed population, and price).

**Table 5. Economics of P fertilizer costs and wheat return.**

Variety	Fertilizer Cost (\$/A)	Wheat Price Which Would Pay for Fertilizer (\$/bu)
Baca	\$16.47	\$4.22
Lincoln	\$6.74	\$1.73
Morgan	\$13.48	\$3.46
Prowers	\$13.48	\$3.46
<b>Average</b>	<b>\$12.54</b>	<b>\$3.22</b>

**The Cooperative Extension Agents who make on-farm testing work:**

Tim Macklin - Baca County; Dick Scott - Prowers County; George Ellicott - Kiowa County; Ron Meyer - Kit Carson County; Kurt Jones - Lincoln County; Bruce Bosley - Morgan County; Ron Jepson - Adams County; Jerry Alldredge - Weld County

**Eastern Colorado Extension Wheat Educators**

Location	Extension Contact	Phone	E-Mail Address
Adams County	Ron Jepson	303-637-8117	adams@coop.ext.colostate.edu
Baca County	Tim Macklin	719-523-6971	baca@coop.ext.colostate.edu
Cheyenne County	Tim Burton	719-767-5716	cheyenne@coop.ext.colostate.edu
Kiowa County	George Ellicott	719-438-5321	kiowa@coop.ext.colostate.edu
Kit Carson County	Ron Meyer	719-346-5571	rmeyer@coop.ext.colostate.edu
Lincoln County	Kurt Jones	719 743-2542	lincoln@coop.ext.colostate.edu
Logan County	Randy Buhler	970-522-3200	logan@coop.ext.colostate.edu
Morgan County	Bruce Bosley	970-867-2493	morgan@coop.ext.colostate.edu
Prowers County	Dick Scott	719-336-2985	prowers@coop.ext.colostate.edu
Sedgwick County	Gary Lancaster	970-474-3479	sedgwick@coop.ext.colostate.edu
Washington County	Stan Pilcher	970-345-2287	washingt@coop.ext.colostate.edu
Weld County	Jerry Alldredge	970-356-4000 Ext. 4465	weld@coop.ext.colostate.edu