

RALF PROJECT SIX MONTHLY REPORT FORMAT

Date: 11/07/2006

RALF Project Number: 02-05

Project Title: Increased productivity and profitability of wheat based cropping system to reduce reliance on opium poppy in northern Afghanistan.

Project Leader: Mark. J. Henning

Organisation: JDA

Collaborators:

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2. CIMMYT, Mohammad Osmanzai, Country Director
3. Cornell University, Peter Hobbs, Dept. of Crops and Soil Sciences

Start Date: January 2005

End Date: January 2007

Budget: USD

Progress Report July to December 2006 from AKF Badakhshan

Badakhshan

1. Crop trials

During the reporting period all of the wheat trials were harvested and results compiled and submitted to CIMMYT.



Image 1: Wheat Trial field in Badakhshan

The wheat trials included a repetition of the previous year's trials: adaptive testing of 25 CIMMYT autumn varieties for irrigated land and 50 CIMMYT spring varieties for rainfed land and cultivation practice trials (date of planting, fertility management and tillage trials).

Table 1: Adaptive research of 25 CIMMYT autumn varieties

S.N.	Rep 1 Plot No	Rep 2 Plot No	Rep 3 Plot No	Date of planting	Date of harvest	Height cm	Grain yield gr/5m2			Total	Avg. gr/5m 2	Yield gr/m2	Yield seer/ jerib	Kg/ hac	Ran k
							R-1	R-2	R-3						
1	9801	9836	9863	Oct 25,05	Jun 29,06	120	3213	3446	3235	9894	3298	659	188	6580	25
2	9802	9826	9852	~	~	118	4075	4501	4265	1284 1	4280	856	244	8540	3
3	9803	9831	9867	~	~	104	3361	3584	4100	1104 5	3681	736	210	7350	21
4	9804	9846	9873	~	~	111	3667	3509	3674	1085 0	3616	723	206	7210	22
5	9805	9841	9859	~	~	107	4032	4323	4555	1291 0	4303	860	245	8575	2
6	9806	9837	9860	~	~	98	4055	4152	4329	1253 6	4178	835	238	8330	6
7	9807	9827	9861	~	~	101	3732	3508	3480	1072 0	3573	714. 6	204	7140	24
8	9808	9832	9853	~	~	97	4122	4013	4316	1245 1	4150	830	237	8295	7
9	9809	9847	9868	~	~	103	4225	3971	4187	1238 3	4127	825	235	8225	10
10	9810	9842	9871	~	~	102	4060	3945	3395	1140 0	3800	760	217	7595	18
11	9811	9838	9874	~	~	105	3931	3963	4212	1210 6	4035	807	230	8050	12
12	9812	9828	9856	~	~	89	3979	3676	3870	1152 5	3841	768	219	7665	16
13	9813	9833	9862	~	~	102	3630	384	3640	1111 9	3706	741	211	7385	20
14	9814	9848	8554	~	~	85	4532	4197	4435	1316 4	4388	877	250	8750	1
15	9815	9843	9869	~	~	89	4340	4084	4189	1261 3	4204	840	240	8400	4
16	9816	9839	9866	~	~	103	3883	4199	3560	1164 2	3880	776	21	7735	14
17	9817	9829	9875	~	~	108	4214	4051	4180	1244 5	4148	829	236	8260	8
18	9818	9834	9857	~	~	101	3368	4044	3730	1114 2	3714	742	212	7420	19
19	9819	9849	9864	~	~	105	3883	3583	4152	1161 8	3872	774	221	7735	15
20	9820	9844	9855	~	~	108	3947	4571	4135	1265 3	4217	843	240	8400	5
21	9821	9840	9851	~	~	108	3960	3549	4256	1176 5	3921	774	224	7840	13
22	9822	9830	9870	~	~	109	3869	3911	3715	1149 5	3831	766	218	7630	17
23	9822	9835	9872	~	~	100	3853	3373	3637	1086 3	3621	724	206	7210	23
24	9823	9850	9858	~	~	104	4350	4010	4060	1242 0	4140	828	236	8260	9
25	9825	9845	9865	~	~	98	4173	4056	4065	1229 4	4098	819	234	8190	11

The 25 autumn varieties again showed high yield results, with 12 varieties producing a harvest of greater than 8000 kg/ha. The lowest yield was 6590 kg/ha and the highest was 8776 kg/ha. This year's harvest results were better than that of last year's trials where the highest yield was 6425 kg/ha.

Table 2: Fifty rainfed variety trial

S.N.	Variety line	Height cm	R-1	R-2	Total yield gram	Yield gr/m2	Yield seer/ jerib
1	No-1	45	69	74	143	14	4
2	No-2	40	46	118	164	32	9
3	No-3	38	73	54	127	12	3
4	No-4	46	98	122	220	22	6
5	No-5	48	85	68	153	15	4
6	No-6	50	120	83	203	20	5
7	No-7	46	44	57	101	10	2
8	No-8	47	103	75	178	17	4
9	No-9	46	114	64	178	17	4
10	No-10	43	77	48	125	12	3
11	No-11	45	85	50	135	13	3
12	No-12	38	58	40	98	9	2
13	No-13	42	57	92	149	14	4
14	No-14	44	49	99	148	14	4
15	No-15	40	42	40	82	8	2
16	No-16	41	43	104	147	14	4
17	No-17	45	51	48	99	9	2
18	No-18	46	61	58	119	11	3
19	No-19	43	54	119	173	17	4
20	No-20	47	90	60	150	15	4
21	No-21	32	30	56	88	8	2
22	No-22	38	56	54	110	11	3
23	No-23	40	46	45	91	9	2
24	No-24	45	88	83	171	17	4
25	No-25	40	43	105	148	14	4
26	No-26	46	88	88	176	17	4
27	No-27	38	50	69	119	11	3
28	No-28	40	63	70	133	13	3
29	No-29	45	86	71	157	15	4
30	No-30	39	59	41	100	10	2
31	No-31	42	62	81	143	14	4
32	No-32	45	80	75	159	15	4
33	No-33	40	52	54	106	10	2
34	No-34	41	90	108	198	19	5
35	No-35	45	108	24	132	13	3
36	No-36	44	69	28	97	9	2
37	No-37	32	39	81	120	12	3
38	No-38	38	47	67	114	11	3
39	No-39	44	67	62	129	12	3
40	No-40	39	50	111	161	16	4
41	No-41	45	66	85	151	15	4
42	No-42	46	67	65	132	13	3
43	No-43	48	85	90	175	17	4
44	No-44	47	82	62	144	14	4
45	No-45	40	62	47	109	10	2
46	No-46	44	55	55	110	10	2
47	No-47	40	44	40	84	8	2
48	No-48	42	60	49	109	10	2
49	No-49	38	67	38	105	10	2
50	No-50	42	50	49	99	9	2

In the date of planting trials, trials of three existing wheat varieties (Pamir 94, Gul and Roshan) were cultivated on Oct 15, Nov 1, Nov 15, Dec 1 and Dec 15. The results across the three varieties were not very conclusive for any one time period. However, all three varieties performed well for the cultivation times of Nov 1st and Nov 15th and lower for the December periods. Last year's performance were best for the Oct 15 and Nov 1 cultivation times.

Table 3: Summer trials report on the basis of variation in plantation date

S/No	Date of planting	Variety	Date of harvesting	Height cm	Yield gr/5 m ²					Average gr/5m ²	Yield gr/m ²	Yield seer/Jerib	Yield kg/ha	Rank
					R-1	R-2	R-3	R-4	Total					
1	15-10-05	Pamir 94	1-7-06	92	3686	3374	4171	2985	14216	3554	710	202	7070	2
2	15-10-05	Gul	1-7-06	99	3713	3374	3597	3170	13854	2770	554	158	5530	3
3	15-10-05	Roshan	1-7-06	102	3951	4043	3669	3450	15156	3790.7	758	216	7560	1
4	1-11-05	Gul	1-7-06	91	3280	3300	3625	3856	14061	3515	703	200	7000	3
5	1-11-05	Pamir	1-7-06	94	3937	4240	3988	3818	15981	3995.2	799	228	7980	2
6	1-11-05	Roshan	1-7-06	91	4208	4159	4137	4473	16977	4244	848	242	8470	1
7	15-11-05	Pamir	1-7-06	99	4391	3378	2856	3720	14345	3586	717	204	7140	3
8	15-11-05	Gul	1-7-06	98	3839	3875	3191	3111	14616	3654	730	308	7280	2
9	15-11-05	Roshan	1-7-06	96	4166	4108	3988	4280	16542	4135.5	827	236	8260	1
10	1-12-05	Gul	1-7-06	95	2594	2816	2678	3196	11284	2821	564	161	5635	2
11	1-12-05	Pamir	1-7-06	84	8068	1205	2554	3018	8645	2161	432	123	4305	3
12	1-12-05	Roshan	1-7-06	88	3410	3375	3193	3474	13452	3363	672.6	192	6720	1
13	15-12-05	Gul	1-7-06	86	2949	3402	3490	3337	13178	3294.5	658.9	188	6930	2
14	15-12-05	Roshan	1-7-06	91	3526	3910	3462	3935	14833	3708.2	741	211	7375	1
15	15-12-05	Pamir	1-7-06	100	4335	3195	3462	2288	13248	3324.5	664.9	189	6615	3

3

The fertility management trial looked at crop yields with synthetic, natural and no fertilizer use and as expected, the results were proportional to those of last year. The highest yield was again of the trial which had received the highest synthetic fertilizer dose (250 kg/ha urea and 150 kg/ha DAP), followed by trial with half the synthetic fertilizer application (125 kg/ha urea and 75 kg/ha DAP). The next best performance was the farm yard manure trial (20MT/ha) and then the zero fertilizer use trial. The results were 8690, 7410, 5668 and 5060 kg/ha respectively. The tillage trial showed that minimum soil disturbance during cultivation period produced higher yields than greater soil disturbance.

Table 4: Summery report of fertility management trials

S. N.	Treatment	Date of			Gram yield gr/ 5 m ²					Aver age yield gr/5 m ²	Yield gr/m ²	Yield seer / jerib	Yield kg/ha	Rank
		Planting	Harvesting	Height cm	R-1	R-2	R-3	R-4	Total					
1	Urea 25gr/m ² DAP 15 gr/m ²	25-10-05	29-6-06	99	4487	4364	4213	4316	17380	4345	869	248.2	8687	1
2	Half of above fertilizer	25-10-05	29-6-06	108	3886	3712	3558	3678	14834	3708.5	741.7	211.4	7416	2
3	0 fertilizer	25-10-05	29-6-06	90	2512	2499	2727	2382	10120	2530	506	144.5	5057	4
4	2kg/m ² FYM	25-10-05	29-6-06	95	2905	2481	2681	3266	11333	2833	566.5	161.9	6266	3

In addition to the variety and management practice trials, nursery lines had been established. Results were collected for 300 new autumn nursery lines for irrigated land, 456 new autumn nursery lines for rainfed land and a repetition of the previous year's observation of 299 spring nursery lines for rainfed land (which had not performed well due to late planting). All results were compiled and submitted to CIMMYT for statistical analyses.

Table 5: 300 line spike information report

Variety	Yield gram/ line	Height	Variety	Yield gram/ line	Height	Variety	Yield gram/ line	Height
No-1	111	95	No-48	179	100	No-95	261	100
No-2	114	98	No-49	155	100	No-96	249	108
No-3	138	101	No-50	161	99	No-97	222	92
No-4	210	105	No-51	249	102	No-98	202	96
No-5	208	110	No-52	211	103	No-99	0	98
No-6	153	104	No-53	195	98	No-100	323	94
No-7	169	110	No-54	242	105	No-101	338	112
No-8	219	107	No-55	280	104	No-102	266	108
No-9	133	98	No-56	248	100	No-103	285	107
No-10	177	99	No-57	256	100	No-104	165	105
No-11	206	105	No-58	264	102	No-105	288	106
No-12	176	102	No-59	185	97	No-106	243	106
No-13	299	106	No-60	211	100	No-107	215	102
No-14	103	92	No-61	193	100	No-108	261	104
No-15	205	107	No-62	212	102	No-109	218	100
No-16	223	108	No-63	185	100	No-110	375	105
No-17	211	108	No-64	219	102	No-111	176	99
No-18	123	99	No-65	251	106	No-112	262	98
No-19	233	104	No-66	189	99	No-113	293	100
No-20	210	110	No-67	293	107	No-114	182	110
No-21	205	105	No-68	188	98	No-115	271	109
No-22	164	104	No-69	224	108	No-116	180	104
No-23	227	110	No-70	204	102	No-117	197	103
No-24	240	112	No-71	257	105	No-118	261	100
No-25	281	118	No-72	180	98	No-119	294	98
No-26	218	105	No-73	222	106	No-120	179	99
No-27	249	108	No-74	277	107	No-121	272	105
No-28	189	100	No-75	263	104	No-122	220	102
No-29	291	104	No-76	171	95	No-123	224	101
No-30	158	103	No-77	141	100	No-124	244	97
No-31	222	106	No-78	254	102	No-125	172	92
No-32	217	107	No-79	312	101	No-126	161	98
No-33	236	110	No-80	203	105	No-127	217	99
No-34	233	110	No-81	274	100	No-128	262	110
No-35	254	109	No-82	212	100	No-129	204	106
No-36	138	104	No-83	198	99	No-130	126	95
No-37	141	95	No-84	232	101	No-131	315	112
No-38	140	96	No-85	252	106	No-132	226	110
No-39	210	105	No-86	189	95	No-133	182	98
No-40	249	100	No-87	309	101	No-134	238	110
No-41	261	100	No-88	205	96	No-135	223	109
No-42	146	99	No-89	258	102	No-136	196	99
No-43	239	108	No-90	260	108	No-137	227	108
No-44	184	98	No-91	298	99	No-138	198	107
No-45	275	105	No-92	268	100	No-139	210	110
No-46	157	96	No-93	237	99	No-140	208	108
No-47	280	102	No-94	259	104	No-141	265	111

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Variety	Yield gram/ line	Height	Variety	Yield gram/ line	Height	Variety	Yield gram/ line	Height
No-142	199	100	No-194	189	96	No-246	191	96
No-143	184	98	No-195	193	98	No-247	231	100
No-144	239	106	No-196	106	100	No-248	217	112
No-145	279	110	No-197	152	102	No-249	225	110
No-146	227	106	No-198	93	100	No-250	0	109
No-147	235	107	No-199	236	112	No-251	219	98
No-148	238	103	No-200	269	110	No-252	184	95
No-149	220	100	No-201	201	110	No-253	206	99
No-150	202	98	No-202	122	96	No-254	251	110
No-151	388	110	No-203	199	98	No-255	274	112
No-152	151	108	No-204	261	105	No-256	296	114
No-153	252	102	No-205	269	112	No-257	239	111
No-154	221	100	No-206	135	97	No-258	130	110
No-155	250	99	No-207	162	95	No-259	318	106
No-156	213	98	No-208	220	108	No-260	187	108
No-157	220	110	No-209	196	100	No-261	144	102
No-158	207	112	No-210	199	102	No-262	302	112
No-159	283	105	No-211	241	110	No-263	224	110
No-160	190	106	No-212	210	107	No-264	239	108
No-161	178	108	No-213	255	112	No-265	309	112
No-162	201	102	No-214	317	114	No-266	189	98
No-163	315	97	No-215	215	108	No-267	225	105
No-164	227	99	No-216	211	110	No-268	238	108
No-165	143	98	No-217	231	104	No-269	201	109
No-166	257	94	No-218	297	108	No-270	213	107
No-167	219	100	No-219	160	98	No-271	252	106
No-168	270	103	No-220	252	105	No-272	237	110
No-169	237	108	No-221	265	108	No-273	158	97
No-170	274	107	No-222	281	110	No-274	286	110
No-171	270	104	No-223	188	99	No-275	197	96
No-172	153	102	No-224	244	98	No-276	228	98
No-173	158	101	No-225	206	107	No-277	306	110
No-174	329	100	No-226	304	110	No-278	215	111
No-175	0	100	No-227	215	102	No-279	222	107
No-176	221	98	No-228	238	106	No-280	289	108
No-177	148	94	No-229	288	108	No-281	248	106
No-178	169	100	No-230	328	112	No-282	281	109
No-179	241	99	No-231	238	113	No-283	259	110
No-180	181	102	No-232	187	99	No-284	239	112
No-181	267	103	No-233	252	100	No-285	155	94
No-182	141	105	No-234	213	102	No-286	244	109
No-183	248	108	No-235	218	105	No-287	359	112
No-184	199	110	No-236	245	110	No-288	215	108
No-185	174	102	No-237	243	111	No-289	163	97
No-186	259	108	No-238	253	112	No-290	178	95
No-187	208	110	No-239	210	98	No-291	270	102
No-188	173	98	No-240	238	99	No-292	202	105
No-189	180	97	No-241	267	102	No-293	207	106
No-190	145	94	No-242	219	101	No-294	217	108
No-191	181	97	No-243	295	108	No-295	263	103
No-192	126	90	No-244	284	97	No-296	250	109
No-193	183	93	No-245	232	109	No-297	260	110

Variety	Yield gram/ line	Height
No-298	0	0
No-299	0	0
No-300	0	0

During the reporting period, second season crops were planted for demonstration purposes after the harvesting of wheat. These crops, along with the oil and maize crops planted in spring/early summer, were then successfully harvested. In 2005, maize had been planted as a second crop in mid July after harvesting of the wheat crop. However, the kernels were not able to reach maturity in the growing season especially with the early frost. Hence in 2006, the same maize variety was planted in mid-May which yielded a vigorous crop by the end of September of 1500 kg/ha. The crop was also retried as a second season crop (planted on July 11th), and this year it yielded lower than the first cultivation (1110 kg/ha).

Five improved varieties of flax and the local flax variety had been planted in the second week of April 2006. They were harvested in the first week of October with varying results. The best performers were Nekoma, local flax and York flax varieties with yields of 680, 670 and 565 kg/ha respectively. The remaining three improved varieties had approximately half the yield of Nekoma. Six varieties of safflower were also tested in early April. It is a new oil crop to the area which the farmers were noting with interest. It was harvested in late October and the highest yield was of Quiriego 88 variety with yield of 1870 kg/ha. Canola crop was also planted in spring with a high yield of 2900kg/ha.

Table 6: Summery report of conservation agriculture minimum tillagan trial 2005-06

S/No	Treatment	Date of		Height cm	Average yield gr/m ²	Yield gr/100m ²	Yield seer/ jreeb	Yield kg/ha	Rank
		Planting	Harvesting						
1	Plough+leveling+seed and fertilizer and leveling	25.10.05	28.6.06	99	702.6	7026	200.7	7024.5	4
2	Plough + seed and fertilizer and leveling	25.10.05	28.6.06	98	836.3	8363	238.9	8361.5	1
3	Plough + seed and fertilizer+ ploughing and leveling	25.10.05	28.6.06	95	798	7980	228	7980	2
4	Seed and fertilizer+ ploughing and leveling	25.10.05	28.6.06	94	728.3	7283	208	7280	3

Second season crops are not commonly grown in the area. Thus soybean, mungbean, millet and sunflower were cultivated as second crops in mid-July and successfully harvested by mid to late October 2006.

2. Farmers' Interaction

Farmers prioritized local rainfed varieties over improved varieties because local varieties have disease and drought resistance, high straw yield and birds never eat them. Improved varieties do not have disease resistance, are dwarf sized, yield low straw and birds eat them very easily.

3. Government Capacity Building

In May, a Letter of Agreement for Development of Government Capacities in Agriculture Research had been signed between AKF and the provincial Agriculture Department in Faizabad. The agreement comprised capacity building of department research staff, construction of a research station on the Dasht-e-Faraq property in Baharak¹ and development of the 2.8 ha of land in Dasht-e-Faraq and 0.8 ha of land in Dasht-e-Qorogh in Faizabad for research purposes. The Department then recruited three people for research purposes (1 Research Officer, 2 Research Assistants).

During the second half of 2006, the Baharak (Dasht-e-Faraq) research station building was designed, approved by the DoAI, construction completed and handed over to the department. Improved vegetable varieties were planted as temporary crops in Dasht-e-Faraq and Dasht-e-Qorog (Faizabad) properties and field days held for surrounding farmers to demonstrate the commitment to research. The research staff had meanwhile also been involved in the CIMMYT activities (the department Research Officer joined AKF staff during the harvest period of the CIMMYT trial plots in Jurm to learn about the CIMMYT trial plots,

¹ A part of this property had thus far been used by AKF for nursery and trial establishment purposes. Now it has been completely handed over to the Department.

harvesting and data recording system and the three research staff attended conservation agriculture workshop in the first half of the year). Research training similar to that conducted in March was held in July 2006 and specifically targeted government research staff who learned about research design and implementation.

With the development of the Baharak research station, it became possible to continue the CIMMYT partnership together with the government. Hence, the trials were shifted from AKF implemented trials in neighbouring Jurm District to government implemented trials on the research station during the autumn plantation season. The trials include a third year repetition of the 15 varieties that were the best performers out of the 25 internationally selected winter wheat varieties for irrigated land tried in Jurm during the past two years. The aim is to introduce a new high yielding variety suitable for the area. Further, the department has established date of planting, sowing rate and fertility trials with winter wheat varieties on irrigated land. CIMMYT has also provided more wheat nursery lines for testing.