

Supplementary material

Table S2.

General wheat management practices

ID	Variety name	Growing purpose	Planting time	Planting method, both years	Seed Treatment	Seed rate (kg/ha)	Pesticide use in the field	Weed control	Irrigation type	Previous crop (rotation)		Type	Fertiliser	
										2011	2012		Amount (kg/ha)	Applied time
F1	Unknown	grain	Oct.-Nov.	hand broadcast	no	180-200	No	No	Irrigated	watermelon	cotton	N	90-100	Tillering / Earing
F2	Unknown	grain	Oct.-Nov.	hand broadcast	no	180-200	No	No	Irrigated	watermelon	cotton	N	100	Tillering / Earing
F3	Unknown	grain	Oct.-Nov.	hand broadcast	no	180-200	No	No	Irrigated	cotton	cotton	N	120	Booting
F4	Unknown	grain	Oct.-Nov.	hand broadcast	no	180-200	No	No	Irrigated	fallow	cotton	N	30-50	Tillering
F5	Lastochka	seed/grain	Oct.-Nov.	drill	Dividend / Vitavax	180-200	No	Hand weeding	Irrigated	cotton	maize	N	120	Booting
F6	Krasnodar 99	grain	Oct.-Nov.	hand broadcast	no	180-200	No	Hand weeding	Irrigated	maize	potato	N	30-50	Booting
F7	Besribey	seed/grain	Nov.	drill	Vitavax	200-220	No	No	Irrigated	cotton	maize	N	120	Booting / Earing
F8	Steklovidnaya 24	grain	Oct.	hand broadcast	no	180-200	No	No	Rainfed	chick pea	wheat	N	120	Booting
F9	Unknown	grain	Nov.	hand broadcast	no	180-200	No	Hand weeding	Irrigated	watermelon	wheat	N	100	Tillering / Earing
F10	Jayhun	grain	Oct.	drill	no	180-200	No	Hand weeding	Irrigated	cotton	cotton	N	120	Earing
F11	Umanka	grain	Sep.-Oct.	broadcast	no	220-240	No	Hand weeding	Irrigated	potato	potato	N	60	Earing
F12	Steklovidnaya 24	grain	Oct.	hand broadcast	no	220-240	No	Herbicide (Gezagard)	Irrigated	potato	potato	N	90	Earing

F13	Sadokat	seed/grain	Nov.-Dec.	hand broadcast	TMTD	180-200	No	No	Irrigated	rape for fodder	maize	N	120	Booting / Earing
F14	Starshina	seed/grain	Sep.-Oct.	hand broadcast	TMTD / Vitavax	200-220	No	hand weeding	Irrigated	cotton	cotton	N	120	Booting / Earing
F15	Yasaul	seed/grain	Sep.-Oct.	drill	Raksill	200-220	No	hand weeding / herbicide (Granstar)	Irrigated	tomato	watermelon	N	150	Booting / Earing
F16	Gratsiya	seed/grain	Oct.	drill	Raksill	200-220	No	hand weeding / herbicide (Granstar)	Irrigated	tomato	tomato	N	150	Booting / Earing
F17	Starshina	seed/grain	Oct.	drill	no	200-220	No	No	Irrigated	maize	tomato	N	150-180	Tillering / Earing
F18	Jayhun	seed/grain	Oct.-Nov.	drill	no	200	No	No	Irrigated	cotton	wheat	N	110	Booting
F19	L115	seed/grain	Oct.-Nov.	drill	no	200	No	No	Irrigated	cotton	barley	N	160	Tillering / Booting
F20	Yasaul	seed/grain	Oct.-Nov.	drill	Dividend	200	No	No	Irrigated	cotton	cotton	N	150	Booting / Earing
F21	Besribey	grain	Oct.	hand broadcast	no	200	No	No	Rainfed	potato	potato	N	100	Booting

Table S3.**Summary of disease incidence and major constraints to wheat production in the fields surveyed**

Sample ID	Growing stage		Loose smut		Common bunt		Other diseases		Weed density	
	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
F1	milk	flowering to milk stage	Not recorded	Not recorded	Not recorded	Not recorded	Septoria, YR (2-3%)	Septoria, TS	high	medium
F2	milk	flowering to milk stage	Not recorded	Not recorded	Not recorded	Not recorded	LS		medium	high
F3	milk	flowering to milk stage	Not recorded	Not recorded	>50%	Not recorded	LS		medium	medium
F4	milk	milk	Not recorded	Not recorded	<25%	Not recorded	LS	TS	medium	medium
F5	flowering	flowering, beginning of milk	Not recorded	Not recorded	Not recorded	Not recorded	YR (2-3%), TS and other LSs		medium	low
F6	flowering	dough	Not recorded	Not recorded	Not recorded	Not recorded	YR and TS	TS, PM	medium	medium
F7	flowering	flowering	<1%	Not recorded	Not recorded	Not recorded	TS	TS	medium	medium
F8	not even, some in heading some are flowering	flowering	Not recorded	Not recorded	Not recorded	Not recorded	TS, YR, PM		high	high
F9	dough stage	flowering-early milk	Not recorded	Not recorded	Not recorded	Not recorded	Plant were too dry		high	high
F10	milk	flow	Not recorded	<1%	Not recorded	Not recorded	TS	TS	medium	medium
F11	flowering	flowering-early milk	Not recorded	Not recorded	Not recorded	Not recorded	LS	PM	low	medium
F12	flowering	early flowering	Not recorded	Not recorded	Not recorded	Not recorded	LS		low	high

F13	milk	milk to dough	Not recorded	Very low	5 %	Not recorded	YR, LR	LR,	high	medium
F14	milk-dough	dough	Not recorded	Not recorded	Not recorded	Not recorded			high	medium
F15	milk	early milk	Not recorded	Not recorded	Not recorded	Not recorded	TS and few rust	TS	high	medium
F16	milk	milk	Not recorded	Not recorded	Not recorded	Not recorded	TS	TS	high	low
F17	milk	milk	Not recorded	Not recorded	Not recorded	Not recorded	TS	YR (v.low). LR (v.low)	high	low
F18	matured	dough	Not recorded	Very low	Not recorded	Not recorded	LS	TS, root rot	medium	high
F19	dough	milk	Not recorded	Not recorded	Not recorded	Not recorded	TS and YR (few)		high	high
F20	dough	milk	Not recorded	Not recorded	Not recorded	Not recorded	LS	TS, root rot	med	high
F21	milk-dough	milk	Not recorded	Not recorded	Not recorded	Not recorded	LS and TS	Septoria, TS	high	high

Note: YR-yellow rust; TS-Tan spot; LS-leaf spot; PM-powdery mildew;