ONLINE APPENDIX

Bt cotton, damage control, and optimal levels of pesticide use in Pakistan

SHAHZAD KOUSER*
Institute of Agricultural and Resource Economics, Faculty of Social Sciences, University of Agriculture, Faisalabad, Pakistan. Email: drshahzadkouser@gmail.com

MATIN QAIM
Department of Agricultural Economics and Rural Development, Georg-August University of Goettingen, 37073 Goettingen, Germany. Email: mqaim@uni-goettingen.de

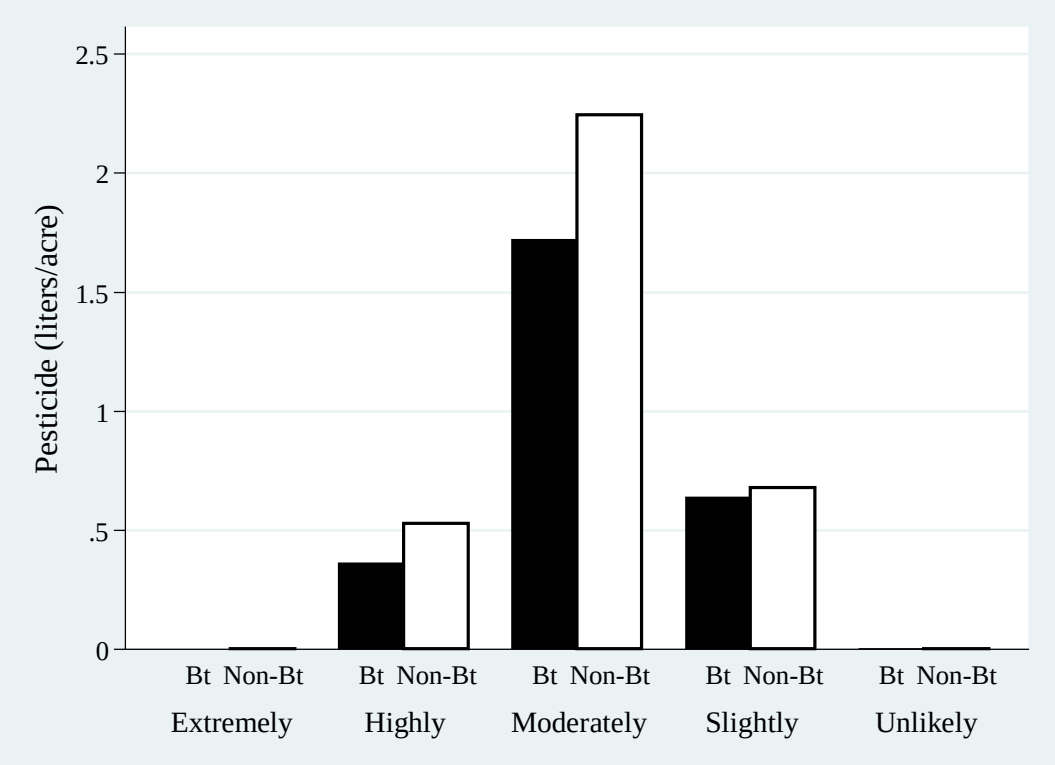

Fig. A1. *Average pesticide use on Bt and non-Bt cotton plots by WHO pesticide hazard category*

*Corresponding author: Tel. +92419200161-2802; Fax: +92-41-9200764; Email: drshahzadkouser@gmail.com

Table A1. *Standard production function estimates with alternative functional forms*

Variables	Cobb-Douglas		Translog	
	Coefficients	S.E.	Coefficients	S.E.
Bt adoption (dummy)	0.135***	0.022	0.135***	0.023
Pesticide (liters/acre)	0.244***	0.021	0.232***	0.021
Fertilizer (kg/acre)	0.210***	0.031	1.189**	0.511
Square of fertilizer	-	-	0.203*	0.114
Labor (hours/acre)	0.218***	0.031	-0.286	0.518
Square of labor	-	-	0.384*	0.182
Irrigation (hours/acre)	0.192***	0.031	1.163**	0.462
Square of irrigation	-	-	0.154	0.122
Fertilizer-labor interaction	-	-	-0.233**	0.099
Fertilizer-irrigation interaction	-	-	-0.312***	0.104
Labor-irrigation interaction	-	-	-0.006	0.119
Seed rate (kg/acre)	-0.006	0.004	-0.005	0.004
Crop length (days)	0.002***	0.000	0.002***	0.0003
Soil quality(low =1 to high =4)	-0.006	0.009	-0.008	0.009
Age (years)	-0.001	0.001	-0.001	0.001
Education (years)	-0.004**	0.002	-0.005**	0.002
Vehari district	-0.000	0.027	-0.003	0.027
Bahawalpur district	0.085***	0.024	0.077***	0.024
Rahim Yar Khan district	0.033	0.024	0.021	0.023
Constant	3.744***	0.148	1.110	1.509

***, **, * indicate that estimates are statistically significant at 1%, 5%, and 10% level, respectively.

Notes: Standard errors are robust. Dependent and independent variables are in log form, except for dummy and categorical variables.

Table A2. *Damage control estimates with alternative specifications*

	(1) Exponential, without IV	(2) Logistic	(3) Weibull
Pesticide (liters/acre)	0.635***	0.448***	0.361***
	(0.052)	(0.098)	(0.068)
Bt adoption (dummy)	0.766***	0.581***	0.138***
	(0.103)	(0.126)	(0.048)

*** indicates that estimates are statistically significant at 1% level.

Notes: Robust standard errors are shown in parentheses. Damage control functions were estimated together with quadratic production functions. The same covariates as in Table 4 of the main paper (column 2) were included, but are not shown here for brevity.