Supplementary material: Tables

For manuscript "Towards a low-pesticide agriculture: bridging practice theory and social-psychological concepts to analyze farmers' routines", authored by Antonia Kaiser Robin Samuel and Paul Burger.

Corresponding author: Antonia Kaiser, Agroscope and University of Basel, email: antonia.kaiser@unibas.ch

Table S1 Standardized results of confirmatory factor analysis for value items, loadings and standardized error variances. $N = 627$

Latent constructs and items	Factor loading	Standard error	Error variance	Standard error
Altruistic				
Social justice	0.713	0.034	0.492	0.048
Being helpful	0.646	0.034	0.583	0.044
Cronbach's alpha = 0.602				
Biospheric				
Living in harmony with nature	0.806	0.026	0.351	0.042
Protecting the environment from pollution	0.812	0.026	0.340	0.042
Cronbach's alpha = 0.789				
Egoistic				
Wealth	0.590	0.038	0.652	0.045
Having an influence on people and events	0.696	0.037	0.516	0.052
Being ambitious and driven	0.554	0.039	0.693	0.043
Cronbach's alpha = 0.645				
Hedonic				
Pleasure	0.661	0.042	0.563	0.056
Enjoying life	0.868	0.048	0.246	0.084
Cronbach's alpha = 0.729				

Table S2 Means, standard deviations and correlations among the indicator variables in the estimated model. Significance levels: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$. $N = 652$

		M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Number of applications: insecticides	1.41 (2.38)	1.000																	
2	Number of applications: herbicides	2.79 (2.01)	0.384***	1.000																
3	Number of applications: fungicides	3.08 (4.67)	0.667***	0.457***	1.000															
4	Total expenditures on pesticides (CHF)	1,059 (1,374)	0.425***	0.353***	0.538***	1.000														
5	Personal norm	6.14 (1.25)	−0.095*	−0.185***	−0.111*	−0.123**	1.000													
6	Injunctive norm 1	4.84 (2.03)	−0.166***	−0.263***	−0.140**	−0.150***	0.466***	1.000												
7	Injunctive norm 2	4.74 (1.88)	−0.113*	−0.189***	−0.088*	−0.138*	0.396***	0.759***	1.000											
8	Altruistic value 1	5.60 (1.30)	−0.160***	−0.117**	−0.127**	−0.031	0.187***	0.185***	0.190***	1.000										
9	Altruistic value 2	6.17 (0.90)	−0.025	−0.057	0.028	0.000	0.107**	0.112**	0.114**	0.466***	1.000									
10	Biospheric value 1	6.08 (0.99)	−0.122	−0.190***	−0.135**	−0.132**	0.295***	0.225***	0.243***	0.447***	0.382***	1.000								
11	Biospheric value 2	6.31 (0.91)	−0.048	−0.131**	−0.455	−0.067	0.286***	0.191***	0.208***	0.451***	0.409***	0.657***	1.000							
12	Immediate objectives: healthy crops	5.73 (1.28)	0.023	0.204***	0.077	0.137**	−0.023	−0.059	−0.028	0.059	0.138***	0.019	0.164***	1.000						
13	Long-term objectives: pass on viable farm	6.09 (1.42)	−0.150***	−0.120**	−0.087*	−0.004	0.078	0.039	0.059	0.141***	0.168***	0.210***	0.250***	0.207***	1.000					
14	Private extension services (dummy)	0.56 (0.50)	0.210***	0.372***	0.208***	0.278***	−0.112**	−0.113**	−0.059	−0.123**	−0.029	−0.168***	−0.078*	0.199***	0.052	1.000				
15	Self-efficacy: own decisions	6.21 (1.08)	0.078	0.032	0.061	0.048	0.102*	−0.049	−0.017	0.075	0.075	0.144***	0.142***	0.118**	0.170***	0.054	1.000			
16	Self-efficacy: reduce pesticides	5.79 (1.22)	0.014	−0.087*	−0.009	0.005	0.229***	0.082*	0.054	0.117**	0.114**	0.174***	0.168***	0.025	0.152***	−0.044	0.430***	1.000		
17	Self-efficacy: reduce impacts	5.85 (1.15)	0.0182	−0.029	0.077	0.034	0.202***	0.094*	0.082*	0.130**	0.118**	0.142***	0.205***	0.064	0.189***	0.003	0.331***	0.602***	1.000	
18	Zone: valley (dummy)	0.55 (0.50)	0.295***	0.295***	0.335***	0.272***	−0.056	−0.105**	−0.047	−0.031	−0.038	−0.129**	−0.015	−0.074	−0.023	0.241***	0.047	0.016	0.041	1.000

Table S3 Model comparisons. Goodness-of-fit indices of estimated model and alternative models. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean squared error of approximation; SRMR = standardized root mean squared residual

	Robust chi^2/df	Robust CFI	Robust TLI	Robust RMSEA	SRMR
Estimated model	2.583	0.935	0.912	0.051	0.048
Alternative model 1 without mediations	2.614	0.939	0.910	0.052	0.044
Alternative model 2 with control variables	3.865	0.813	0.772	0.068	0.073
Recommendations (Kline 2015; Schermelleh-Engel et al. 2003):					
Acceptable fit	≤3	$0.90 \leq CFI \leq 0.95$	$0.90 \leq TLI \leq 0.95$	≤0.10	<0.10
Good fit	≤2	$0.95 < CFI \leq 1.00$	$0.95 < TLI \leq 1.00$	≤0.05	<0.05

Table S4 Internal and convergent reliability. CR = composite reliability; AVE = average variance extracted. *N* = 652

Latent construct	Indicator	Internal reliability	Convergent reliability		
		Cronbach's alpha	Standardized factor loadings	CR	AVE
Personal norms	Personal norm		1.000		1.000
Social norms	Injunctive norm 1	0.861	0.942	0.873	0.777
	Injunctive norm 2		0.805		
Values	Altruistic value 1	0.767	0.590	0.765	0.457
	Altruistic value 2		0.528		
	Biospheric value 1		0.791		
	Biospheric value 2		0.810		
Immediate objectives	Healthy crops		1.000		1.000
Long-term objectives	Pass on viable farm		1.000		1.000
Knowledge	Private extension services		1.000		1.000
Self-efficacy	Self-efficacy: own decisions	0.719	0.500	0.746	0.510
	Self-efficacy: reduce pesticides		0.847		
	Self-efficacy: reduce impacts		0.712		
Materials	Zone: valley		1.000		1.000
Pesticide use	Number of applications of…	0.715		0.822	0.614
	• insecticides, incl. biological insecticides		0.739		
	• herbicides		0.565		
	• fungicides, incl. biological fungicides		0.839		
	Total expenditures on pesticides in CHF		0.651		
	Recommendations:	>0.7 (Nunnally 1978)	>0.5 (Tracey et al. 1999)	>0.7 (Fornell and Larcker 1981)	>0.5 (Fornell and Larcker 1981)

Table S5 Correlations among the latent constructs in the estimated model and discriminant validity testing. The diagonal includes the square root of the average variance extracted (AVE) in brackets; the correlations between the latent construct are displayed underneath the diagonal. $N = 652$

		1	2	3	4	5	6	7	8	9
1	Personal norms	[1.000]								
2	Social norms	0.495	[0.881]							
3	Values	0.342	0.289	[0.676]						
4	Immediate objectives	0.005	−0.055	0.133	[1.000]					
5	Long-term objectives	0.098	0.083	0.287	0.181	[1.000]				
6	Knowledge	−0.082	−0.121	−0.143	0.186	−0.041	[1.000]			
7	Self-efficacy	0.268	0.095	0.285	0.024	0.082	−0.031	[0.714]		
8	Materials	0.055	−0.111	−0.083	−0.073	−0.024	0.241	0.036	[1.000]	
9	Pesticide use	−0.157	−0.246	−0.148	0.100	−0.170	0.350	0.021	0.428	[0.784]
	Recommendation:	Square root of AVE > correlation coefficients between latent variables (Fornell and Larcker 1981)								

Table S6 Structural results (unstandardized coefficients) including direct, indirect and total effects of mediated variables. Significance levels: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$. $N = 652$

Path		Unstandardized path coefficient	Standard error	z
H1:	Personal norms → Pesticide use	−0.05	0.053	−0.946
H2a:	Immediate objectives → Pesticide use	0.14*	0.061	2.345
H2b:	Long-term objectives → Pesticide use	−0.17*	0.078	−2.139
H3a:	Values → Personal norms	0.27**	0.091	2.983
H3b:	Values → Long-term objectives	0.53***	0.100	5.313
H4a:	Self-efficacy → Pesticide use	0.09	0.090	0.973
H4b:				
Indirect effects	Self-efficacy → Pesticide use (Mediator: Personal norms)	−0.02	0.016	−0.927
Direct effects	Self-efficacy → Personal norms	0.218**	0.066	3.273
	Personal norms → Pesticide use	−0.07	0.072	−0.955
Total effects	Self-efficacy → Pesticide use	0.07	0.088	0.817
H5a:	Social norms → Pesticide use	−0.07	0.072	−0.955
H5b:				
Indirect effects	Social norms → Pesticide use (Mediator: Personal norms)	−0.02	0.020	−0.966
Direct effects	Social norms → Personal norms	0.28***	0.036	7.786
	Personal norms → Pesticide use	−0.07	0.072	−0.955
Total effects	Social norms → Pesticide use	−0.15**	0.047	−3.177
H6:	Knowledge → Pesticide use	0.77***	0.157	4.860
H7:	Materials → Pesticide use	1.26***	0.157	7.997
Covariances				
	Values ←→ Self-efficacy	0.23***	0.044	5.167
	Knowledge ←→ Materials	0.06***	0.010	6.239
	Immediate objectives ←→ Knowledge	0.12***	0.026	4.539

Table S7 Robustness checks. Structural results (standardized coefficients) of estimated model and alternative models. Standard errors are given in parentheses. Significance levels: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

Path	Estimated model	Alternative model 1 without mediations	Alternative model 2 with control variables
Social norms → Pesticide use	−0.14* (0.057)	−0.14* (0.057)	−0.12 (0.060)
Social norms → Pesticide use (Mediator: Personal norms)	−0.02 (0.022)		−0.02 (0.023)
Social norms → Personal norms	0.43*** (0.039)		0.43*** (0.039)
Personal norms → Pesticide use	−0.05 (0.053)	−0.04 (0.053)	−0.05 (0.053)
Immediate objectives → Pesticide use	0.10* (0.043)	0.11* (0.045)	0.10* (0.044)
Long-term objectives → Pesticide use	−0.14* (0.580)	−0.13* (0.061)	−0.14* (0.060)
Values → Personal norms	0.17** (0.054)		0.17** (0.054)
Values → Long-term objectives	0.29*** (0.047)		0.29*** (0.047)
Self-efficacy → Pesticide use	0.05 (0.050)	0.07 (0.051)	0.07 (0.050)
Self-efficacy → Pesticide use (Mediator: Personal norms)	−0.01 (0.010)		−0.01 (0.010)
Self-efficacy → Personal norms	0.18** (0.053)		0.18** (0.053)
Knowledge → Pesticide use	0.22*** (0.038)	0.22*** (0.038)	0.18*** (0.042)
Materials → Pesticide use	0.36*** (0.037)	0.36*** (0.037)	0.34*** (0.040)
Values → Pesticide use		−0.04 (0.044)	

Organic production → Pesticide use			−0.14* (0.061)
Farm size → Pesticide use			0.05 (0.041)
Higher education → Pesticide use			0.06 (0.046)
Farmer age → Pesticide use			0.00 (0.039)
Household income → Pesticide use			0.09* (0.044)
Online response mode → Pesticide use			0.04 (0.046)
N	652	652	652