

**Table S1.** Surveyed provinces and acreage of wheat, maize, and rice[1]

Region	cultivation area(10 <sup>3</sup> ha)		
	Wheat	Maize	Rice
Beijing	8.39	35.65	0.2
Hebei	2216.92	3417.1	78.72
Shanxi	535.88	1742.22	2.45
Inner Mongolia	478.96	3823.9	160.86
Jilin	4.76	4287.24	837.14
Heilongjiang	48.74	5480.67	3872.03
Shanghai	7.51	1.24	104.06
Anhui	2825.2	1234.76	2512.08
Jiangxi	14.4	47.6	3441.83
Shandong	3934.43	3871.09	112.48
Henan	5673.67	3818.01	617.07
Guangxi	3.86	596.97	1760.11
Chongqing	18.52	440.93	657.27
Sichuan	596.82	1839.36	1866.32
Yunnan	320	1802.46	818.93
Shaanxi	964.19	1179.44	105.09

**Table S2.** Green production technology list

Green production technologies	Green production technologies		
	Wheat	Maize	Rice
Scientific fertilization technology	Soil testing and formulated fertilization technology	Soil testing and formulated fertilization technology	Soil testing and formulated fertilization technology
	Nitrogen fertilizer backward technology	Micro-fertilizer application technology Stepwise fertilization technology	
Water-saving irrigation technology	Frozen water irrigation technology	Irrigation technique	Irrigation technique
Biological control technology	One spray three prevention	Chemical control technology	Control technology of caterpillar fungus disease
	Spring grass and autumn treatment	Chemical fertilizer, and pesticide identification technologies	Chemical fertilizer, and pesticide identification technologies
	Chemical fertilizer, and pesticide identification technologies		
Conservation tillage technology	Deep tilling and deep loosening technology	Deep tilling and deep loosening technology	Timely land preparation technology
	Straw returning technology		Straw returning technology
	Organic fertilizer application technology		Organic fertilizer application technology

**Table S3.** Variable name and expected direction

Variable name	Variable definition
Cognition of production technology	1=Yes, 0=No
Technology benefits expected	quantity
Gender	1=Not at all, 2=Not very well, 3= General, 4=More well, 5=Very well
Age	1=Not at all, 2=Not very well, 3= General, 4=More well, 5=Very well
Education level	1=willing to adopt, 2=unwilling to adopt
Experience of planting	1=willing to adopt, 2=unwilling to adopt
Number of family members	1=willing to adopt, 2=unwilling to adopt
Geomorphic type	1=willing to adopt, 2=unwilling to adopt
Soil barrier factor	1=Male, 0=Female
Number of farmland	years
Types of business entities	1=Elementary school and below, 2=Junior high school/ junior high school, 3=High school, 4=College, 5=Bachelor's degree or above
Proportion of planting income	years
Ln(cultivated area)	persons
Planting-breeding type	1=Flat land, 0=Mountainous or sloping land or depression
Cognition of production technology	1=Yes; 0=No
Technology benefits expected	quantity
Gender	1=Yes; 0=No
Age	quantity
Education level	mu
Experience of planting	1=Yes; 0=No

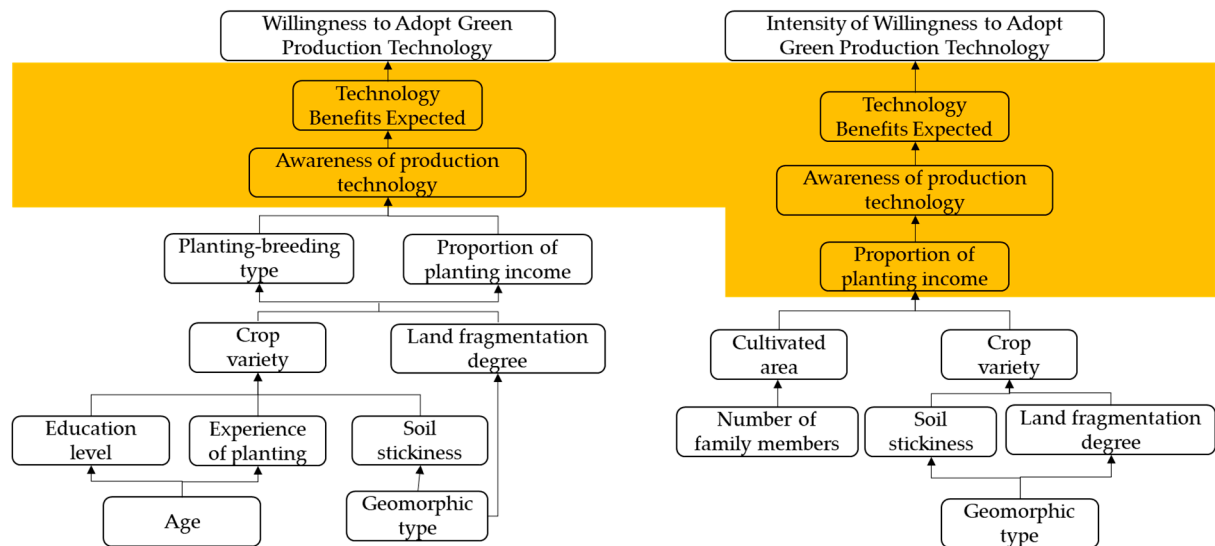
**Table S4.** Results of model fitting of factors influencing green production technologies.

Indicator	Scientific fertilization technology		Water-saving irrigation technology		Biological control technology		Conservation tillage technology	
	Coefficient	Odds ratio	Coefficient	Odds ratio	Coefficient	Odds ratio	Coefficient	Odds ratio
Cognition of production technology	0.180(0.092)**	1.197(0.110)**	4.114(0.961)***	61.161(58.777)***	0.898(0.374)**	2.456(0.918)**	0.000(0.129)	1.000(0.129)
Technology benefits expected	0.089(0.268)	1.093(0.293)	2.643(0.958)***	14.055(13.467)***	0.970(0.525)*	2.639(1.385)*	1.474(0.387)***	4.365(1.689)***
Gender	-0.260(0.198)	0.771(0.153)	0.258(0.422)	1.295(0.547)	0.037(0.221)	1.037(0.229)	0.029(0.286)	1.030(0.295)
Age	-0.014(0.012)	0.986(0.011)	-0.002(0.024)	0.998(0.024)	-0.014(0.013)	0.986(0.013)	-0.001(0.017)	0.999(0.017)
Education level	-0.388(0.122)***	0.679(0.083)***	0.425(0.232)*	1.529(0.354)*	-0.316(0.133)**	0.729(0.097)**	0.056(0.154)	1.057(0.163)
Experience of planting	0.004(0.009)	1.004(0.009)	-0.010(0.020)	0.990(0.020)	0.020(0.010)**	1.021(0.011)**	0.007(0.014)	1.007(0.014)
Number of family members	-0.157(0.054)***	0.854(0.046)***	-0.213(0.124)*	0.808(0.100)*	-0.081(0.058)	0.922(0.054)	0.248(0.076)***	1.281(0.098)***
Geomorphic type	0.435(0.288)	1.545(0.445)	0.489(0.636)	1.630(1.038)	0.132(0.336)	1.142(0.384)	0.165(0.399)	1.180(0.471)
Soil barrier factor	0.578(0.399)	1.783(0.711)	1.209(0.64)*	3.349(2.144)*	0.422(0.443)	1.526(0.676)	0.589(0.516)	1.802(0.929)
Number of farmland	-0.015(0.015)	0.985(0.015)	-0.010(0.027)	0.990(0.027)	-0.068(0.020)***	0.934(0.019)***	-0.087(0.029)***	0.917(0.027)***
Types of business entities	0.168(0.314)	1.183(0.372)	-0.667(0.614)	0.513(0.315)	-0.400(0.374)	0.670(0.251)	0.352(0.404)	1.423(0.575)
Proportion of planting income	0.789(0.264)*	2.202(0.582)***	0.761(0.554)***	2.140(1.185)	0.032(0.284)***	1.033(0.293)	0.175(0.387)***	1.191(0.461)
Ln(cultivated area)	-0.196(0.202)	0.822(0.166)	0.259(0.347)	1.296(0.45)	0.655(0.231)***	1.926(0.445)***	0.71(0.273)***	2.034(0.556)***
Planting-breeding type	0.226(0.267)	1.254(0.334)	-0.311(0.571)	0.732(0.418)	-0.021(0.313)	0.979(0.307)	0.414(0.374)	1.514(0.566)
Crop varieties	Controlled							
Constant term	-1.467(0.851)*	0.231(0.196)*	-6.734(1.813)***	0.001(0.002)***	-3.387(1.001)***	0.034(0.034)***	-5.966(1.269)***	0.003(0.003)***
LR chi2(17)	167.730		241.460		203.580		114.250	
Prob > chi2	0.000		0.000		0.000		0.000	
Log likelihood	-399.472		-122.873		-342.751		-218.399	

Pseudo R <sup>2</sup>	0.174	0.496	0.229	0.207
Sample size		709		

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\*Indicates the significance of the coefficients at P <10%, \*\* indicates significance at P <5%, \*\*\* indicates significance at P <1%, and the robust standard errors are in parentheses.



**Figure S1.** Summary of overall regression results

## References

1. National Bureau of Statistics (NBS). Online statistical database. Beijing. 2020. Available online: <http://www.stats.gov.cn/> (accessed on 7 January 2022).