Appendix of Supplementary Materials

	lnyld
plant density	0.329***
	(0.019)
mtmin5	0.168^{***}
	(0.031)
mtmin6	-0.153^{***}
	(0.042)
mtmin7	0.211^{***}
	(0.038)
tmin8	-0.446^{***}
	(0.033)
tmin9	0.451^{***}
	(0.029)
$ mt{tmax5}$	-0.031
	(0.026)
$ ext{tmax6}$	0.071^{*}
	(0.038)
tmax7	0.170^{***}
	(0.031)
tmax8	0.306^{***}
	(0.031)
tmax9	-0.135^{***}
	(0.027)
tmin5 \times plant density	-0.004***
	(0.001)
tmin6 \times plant density	0.003^{**}
	(0.001)
tmin 7 \times plant density	-0.007***
	(0.001)
tmin8 \times plant density	0.015^{***}
	(0.001)
tmin9 \times plant density	-0.014^{***}
	(0.001)
$tmax5 \times plant density$	0.000
	(0.001)
$tmax6 \times plant$ density	-0.001
	(0.001)
$tmax7 \times plant density$	-0.005***
	(0.001)
tmax8 \times plant density	-0.011***
	(0.001)
tmax9 \times plant density	0.005***
	(0.001)

Table S1: Regression results of the main model specification

Continued			
PDSI5(wet)	-0.077**		
	(0.033)		
PDSI6(wet)	-0.148***		
	(0.039)		
PDSI7(wet)	$(0.146)^{-0.00}$		
DDCI9(mot)	(0.029)		
1 D516(wet)	-0.400 (0.037)		
PDSI9(wet)	(0.031) 0.021		
1 2010(000)	(0.035)		
PDSI5(dry)	-1.479***		
	(0.067)		
PDSI6(dry)	1.885^{***}		
	(0.121)		
PDSI7(dry)	0.000		
	(0.087)		
PDSI8(dry)	-1.363***		
	(0.088)		
PDSI9(dry)	$-0.652^{-0.077}$		
$PDSI5(wot) \times plant donsity$	(0.077)		
$1 \text{DSI3(wet)} \times \text{plant density}$	(0.001)		
$PDSI6(wet) \times plant density$	0.006***		
	(0.001)		
$PDSI7(wet) \times plant density$	-0.005***		
	(0.001)		
$PDSI8(wet) \times plant density$	0.016^{***}		
	(0.001)		
$PDSI9(wet) \times plant density$	-0.000		
	(0.001)		
$PDS15(dry) \times plant density$	0.051^{***}		
DDSI6(dry) v plant density	(0.002)		
$PDSIG(dry) \times plant density$	-0.000		
$PDSI7(dry) \times plant density$	-0.004)		
$1 DSIT(ury) \times plant density$	(0.003)		
$PDSI8(drv) \times plant density$	0.046***		
	(0.003)		
$PDSI9(dry) \times plant density$	0.023***		
	(0.003)		

Continued	
year	0.009^{***} (0.000)
RW	0.039^{***} (0.005)
other GM	0.040^{***} (0.003)
1 if previous crop is corn	0.080^{***} (0.027)
1 if previous crop is wheat	0.120^{***} (0.027)
1 if previous crop is alfalfa or alfalfa/hay	0.185^{***} (0.026)
1 if previous crop is soybean	0.095^{***} (0.026)
1 if previous crop is lupine	-0.175^{***} (0.035)
fall tillage, 1 if yes, 0 if no	$0.000 \\ (0.002)$
spring tillage, 1 if yes, 0 if no	-0.037^{***} (0.004)
apply insectic ide, 1 if yes, 0 if no	-0.062^{***} (0.004)
fertilizer N	0.000^{***} (0.000)
Observations	28521
R-squared	0.662

Notes: Table regresses plot-level log of yield on plant density, weather variables(monthly average of daily minimum and maximum temperature(**tmin** and **tmax**), and monthly PDSI from May to September), the interactions between plant density and weather variables, and the managerial inputs and practices described in Table 1. The model also includes linear time trend and production zone fixed effect model. Units for **tmin** and **tmax** are °C. Unit for plant density is 1000 acre⁻¹. In consideration of the possible heteroskedasticity, Huber-White's robust standard errors are calculated and shown in parentheses. ***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.

	(1)
	(1) Invld
planting donsity	<u> </u>
planting density	(0.207)
$RW \times planting density$	-2 025***
$100 \times \text{planting density}$	(0.132)
other GM × planting density	(0.152)
other Givi × planning density	(0.072)
tmin5	(0.012) 0.282***
	(0.056)
tmin6	(0.504^{***})
	(0.087)
tmin7	-0.244***
	(0.077)
tmin8	-0.650***
	(0.059)
tmin9	0.702***
	(0.054)
tmax5	0.068
	(0.044)
tmax6	-0.155**
	(0.071)
tmax7	0.380***
	(0.048)
tmax8	0.364***
	(0.056)
tmax9	-0.372^{***}
	(0.047)
tmin5 \times planting density	-0.008***
	(0.002)
tmin6 \times planting density	-0.020***
	(0.003)
tmin7 \times planting density	0.009^{***}
	(0.003)
tmin8 \times planting density	0.022***
	(0.002)
tmin9 \times planting density	-0.023***
	(0.002)
$tmax5 \times planting density$	-0.003*
	(0.002)
$tmax6 \times planting density$	0.007***
	(0.003)
$tmax i \times planting density$	$-0.012^{++.5}$
	(0.002)
$\max \delta \times \text{planting density}$	-0.013
tmar v planting dangity	(0.002) 0.012***
$\tan xy \times \operatorname{pranting density}$	(0.013)
	(0.002)

Table S2: Regre	ssion results of the	model specification	in equations	(1) and (8)
		(1)	

Continued

$RW \times tmin5$	3.550^{***}
	(0.559)
$RW \times tmin6$	4.771^{***}
	(0.556)
$\mathrm{RW} imes \mathrm{tmin7}$	-4.341***
	(0.617)
$RW \times tmin8$	-1.386***
	(0.374)
$RW \times tmin9$	1.354^{***}
	(0.342)
other GM \times tmin5	-0.389***
	(0.140)
other GM \times tmin6	-0.646***
	(0.144)
other GM \times tmin7	0.546^{***}
	(0.141)
other GM \times tmin8	1.269^{***}
	(0.157)
other GM \times tmin9	-1.293^{***}
	(0.127)
$RW \times tmax5$	-2.967^{***}
	(0.395)
$RW \times tmax6$	-2.851^{***}
	(0.558)
$\mathrm{RW} imes \mathrm{tmax7}$	1.108^{***}
	(0.373)
$\mathrm{RW} \times \mathrm{tmax8}$	2.100^{***}
	(0.535)
$RW \times tmax9$	-1.829^{***}
	(0.414)
other GM \times tmax5	-0.004
	(0.114)
other GM \times tmax6	-0.544^{***}
	(0.138)
other GM \times tmax7	-0.091
	(0.108)
other GM \times tmax8	-0.705***
	(0.125)
other GM \times tmax9	1.038***
	(0.108)

PDSI5(wet)		-0.594***
		(0.070)
PDSI6(wet)		0.149
		(0.091)
PDSI7(wet)		-0.397^{***}
		(0.064)
PDSI8(wet)		-0.583^{***}
		(0.070)
PDSI9(wet)		-0.166***
		(0.063)
PDSI5(dry)		-4.155***
		(0.462)
PDSI6(dry)		2.785***
		(0.294)
PDSI7(dry)		0.386*
		(0.210)
PDSI8(dry)		-2.973***
		(0.251)
PDSI9(dry)		-0.447**
	1 1	(0.183)
PDSI5(wet)	\times planting density	0.020***
	1 1	(0.002)
PDS16(wet)	\times planting density	-0.005
		(0.003)
PDSI7(wet)	\times planting density	0.014^{+++}
		(0.002)
PDS18(wet)	\times planting density	0.021
	· · · · · · · · · · · · · · · · · · ·	(0.003)
PDS19(wet)	\times planting density	(0.006^{-11})
	· · · · · · · · · · · · · · · · · · ·	(0.002)
PDSI5(dry)	\times planting density	0.147
	· · · · · · · · · · · · · · · · · · ·	(0.017)
PDSI6(dry)	\times planting density	-0.097
	· · · · · · · · · · · · · · · · · · ·	(0.011)
PDSI((ary)	\times planting density	-0.018
DDCIO(J)	v planting dangitar	(U.UU8) 0.109***
r DS18(ary)	\times planning density	(0,000)
DDGI0(4mm)	× planting density	(0.009) 0.016**
r Dora(ury)	~ pranning density	(0.010)
		(0.007)

Continued

Continued

$RW \times PDSI5(wet)$	2.185^{***}
	(0.381)
$RW \times PDSI6(wet)$	-2.111^{***}
	(0.438)
$RW \times PDSI7(wet)$	0.998^{***}
	(0.236)
$RW \times PDSI8(wet)$	-0.148
	(0.479)
$RW \times PDSI9(wet)$	1.175^{***}
	(0.295)
other $GM \times PDSI5(wet)$	0.609^{***}
	(0.115)
other $GM \times PDSI6(wet)$	-0.156
	(0.128)
other $GM \times PDSI7(wet)$	0.681^{***}
	(0.089)
other $GM \times PDSI8(wet)$	0.904^{***}
	(0.132)
other $GM \times PDSI9(wet)$	-0.364^{***}
	(0.133)
$RW \times PDSI5(dry)$	5.027^{***}
	(0.618)
$RW \times PDSI6(dry)$	3.669^{***}
	(1.292)
$RW \times PDSI7(dry)$	-3.996***
	(0.473)
$RW \times PDSI8(dry)$	2.584^{**}
	(1.062)
$RW \times PDSI9(dry)$	-0.459
	(0.881)
other $GM \times PDSI5(dry)$	3.768^{***}
	(0.503)
other $GM \times PDSI6(dry)$	-3.970***
	(0.433)
other $GM \times PDSI7(dry)$	0.189
	(0.272)
other $GM \times PDSI8(dry)$	4.147***
	(0.386)
other $GM \times PDSI9(dry)$	-0.420
	(0.275)

Continued

$RW \times tmin5 \times planting density$	-0.116***
	(0.018)
$RW \times tmin6 \times planting density$	-0.162***
	(0.018)
$RW \times tmin7 \times planting density$	0.145^{***}
	(0.021)
RW \times tmin8 \times planting density	0.051^{***}
	(0.012)
RW \times tmin9 \times planting density	-0.046^{***}
	(0.011)
RW \times tmax5 \times planting density	0.095^{***}
	(0.013)
$RW \times tmax6 \times planting density$	0.096^{***}
	(0.018)
$RW \times tmax7 \times planting density$	-0.039***
	(0.012)
$RW \times tmax8 \times planting density$	-0.071***
	(0.018)
$RW \times tmax9 \times planting density$	0.064^{***}
	(0.014)
other GM \times tmin5 \times planting density	0.012**
	(0.005)
other GM \times tmin6 \times planting density	0.023***
	(0.005)
other GM \times tmin7 \times planting density	-0.018***
	(0.005)
other GM \times tmin8 \times planting density	-0.040
other CM v torico v chesting descite	(0.005)
other GM \times tmin9 \times planting density	(0.042^{+++})
other CM v traces v planting density	(0.004)
other $GM \times tmax_5 \times planting density$	(0.000)
other CM x trave x planting density	(0.004) 0.017***
other $GW \times tmax0 \times planting density$	(0.017)
other $CM \times tmax7 \times planting density$	(0.003)
$\cos \alpha = \cos \alpha + \cos \alpha$	(0.003)
other GM \times tmax8 \times planting density	0.004/
other Givi A timaxo A planting delisity	(0.022)
other GM \times tmax9 \times planting density	-0 034***
other Give A timaxy A pranting defisity	(0,004)
	(10.001)

Continued

$RW \times PDSI5(wet) \times planting density$	-0.073***
	(0.012)
$RW \times PDSI6(wet) \times planting density$	0.072***
	(0.015)
$RW \times PDSI7(wet) \times planting density$	-0.035***
	(0.008)
$RW \times PDSI8(wet) \times planting density$	0.003
	(0.016)
$RW \times PDSI9(wet) \times planting density$	-0.038***
	(0.010)
$RW \times PDSI5(dry) \times planting density$	-0.172***
	(0.022)
$RW \times PDS16(dry) \times planting density$	-0.129***
	(0.044)
$RW \times PDS17(dry) \times planting density$	0.146^{***}
	(0.017)
$RW \times PDSI8(dry) \times planting density$	-0.089**
	(0.035)
$RW \times PDS19(dry) \times planting density$	0.012
	(0.029)
other $GM \times PDSI5(wet) \times planting density$	-0.020***
	(0.004)
other $GM \times PDS16(wet) \times planting density$	0.005
	(0.004)
other $GM \times PDSI7(wet) \times planting density$	-0.024***
	(0.003)
other $GM \times PDSI8(wet) \times planting density$	-0.030***
	(0.005)
other $GM \times PDS19(wet) \times planting density$	0.012^{***}
	(0.005)
other $GM \times PDSI5(dry) \times planting density$	-0.133***
	(0.018)
other $GM \times PDSI6(dry) \times planting density$	0.142***
	(0.015)
other $GM \times PDSI7(dry) \times planting density$	-0.008
	(0.010)
other $GM \times PDSI8(dry) \times planting density$	-0.142***
	(0.013)
other $GM \times PDSI9(dry) \times planting density$	0.013
	(0.009)

1 if previous crop is corn	-0.006
	(0.032)
1 if previous crop is wheat	0.038
	(0.032)
	× ,
1 if previous crop is alfalfa or alfalfa/hay	0.090^{***}
	(0.031)
	· · · ·
1 if previous crop is soybean	0.001
	(0.031)
1 if previous crop is lupine	-0.092^{***}
	(0.033)
fall tillage, 1 if yes, 0 if no	-0.001
	(0.003)
spring tillage, 1 if yes, 0 if no	-0.048***
	(0.005)
apply insecticide, 1 if yes, 0 if no	-0.076***
	(0.005)
	0 000444
fertilizer N	0.000***
	(0.000)
Observations	28521
R-squared	0.705

Notes: Table regresses plot-level log of yield on plant density, weather variables(monthly average of daily minimum and maximum temperature(**tmin** and **tmax**), and monthly PDSI from May to September), GM variety dummies, and managerial inputs and practices. The specification also includes linear time trend, production fixed effect and the interactions among plant density, weather variables, and GM variety dummies. Units for **tmin** and **tmax** are °C. Unit for plant density is 1000 acre⁻¹. In consideration of the possible heteroskedasticity, Huber-White's robust standard errors are calculated and shown in parentheses. ***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.

	lnyld
planting density	0.396^{***}
	(0.020)
year	0.012^{***}
	(0.000)
mtmin5	0.142^{***}
	(0.029)
tmin6	-0.310***
	(0.041)
tmin7	0.061
	(0.042)
tmin8	-0.237^{***}
	(0.033)
tmin9	0.498^{***}
	(0.033)
tmax5	-0.070***
	(0.025)
tmax6	0.195^{***}
	(0.037)
tmax7	0.237^{***}
	(0.034)
tmax8	0.210^{***}
	(0.031)
tmax9	-0.100***
	(0.027)
tmin5 \times planting density	-0.003***
	(0.001)
tmin6 \times planting density	0.009^{***}
	(0.001)
tmin7 \times planting density	-0.001
	(0.002)
tmin8 \times planting density	0.007^{***}
	(0.001)
tmin9 \times planting density	-0.016***
	(0.001)
tmax5 \times planting density	0.002^{*}
	(0.001)
tmax $6 \times$ planting density	-0.006***
	(0.001)
tmax7 \times planting density	-0.008***
	(0.001)
tmax8 \times planting density	-0.008***
	(0.001)
tmax9 \times planting density	0.004^{***}
	(0.001)

Table S3: Regression results of the main model specification without including the managerial inputs and practices as control variables

Continued	
PDSI5(wet)	-0.046
	(0.033)
PDSI6(wet)	-0.168^{***}
	(0.042)
PDSI7(wet)	0.212^{***}
	(0.029)
PDSI8(wet)	-0.363***
	(0.038)
PDSI9(wet)	0.011
	(0.037)
PDSI5(dry)	$-1.(38^{-1})$
DDSI6(dmr)	(0.008) 1 449***
r DSI0(dry)	(0.110)
PDSI7(dry)	0.220***
i Doir (dry)	(0.074)
PDSI8(drv)	-1.538***
	(0.096)
PDSI9(dry)	-0.134
	(0.082)
$PDSI5(wet) \times planting density$	0.001
	(0.001)
$PDSI6(wet) \times planting density$	0.006^{***}
	(0.001)
$PDSI7(wet) \times planting density$	-0.007***
	(0.001)
$PDSI8(wet) \times planting density$	0.013***
	(0.001)
$PDS19(wet) \times planting density$	-0.000
$PDSI5(dry) \times planting density$	0.001)
$1 \text{ DSI3(dry)} \times \text{planting density}$	(0.000)
$PDSI6(drv) \times planting density$	-0.048***
	(0.004)
$PDSI7(drv) \times planting density$	-0.010***
	(0.003)
$PDSI8(dry) \times planting density$	0.052***
	(0.003)
$PDSI9(dry) \times planting density$	0.004
	(0.003)
Observations	28521
R-squared	0.641

Notes: Table regresses plot-level log of yield on plant density, weather variables(monthly average of daily minimum and maximum temperature(**tmin** and **tmax**), and monthly PDSI from May to September), and the interactions between plant density and weather variables. The model also includes linear time trend and production zone fixed effect model. Units for **tmin** and **tmax** are °C. Unit for plant density is 1000 acre⁻¹. In consideration of the possible heteroskedasticity, Huber-White's robust standard errors are calculated and shown in parentheses. ***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.

All Months Jun-Aug Estimates P-value Estimates P-value tmin & tmax 0.000 -0.01950.000 -0.0056tmin-0.00420.000 0.0000.0154

0.000

-0.0209

0.000

-0.0153

tmax

Table S4: Estimated changes in the effects of plant density on yield as a result of $1^{\circ}C$ warming

Notes: (1) The table shows the results of the first robustness check (the main specification without including managerial inputs and practices as control variables). (2) The first column indicates what weather variables the marginal effects of plant density are based on. The first row indicates a 1°C increase in both **tmin** and **tmax**. The second row refers to a warming scenario where only **tmin** increases by 1°C. The third row refers to a 1°C increase in **tmax**. (3) The second and the third column report coefficients and p-values of the changes in the marginal effects of plant density as a result of warming scenarios (both **tmin** and **tmax**, and **tmin** and **tmax** separately) where the temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the changes in the marginal effects of warming scenarios where the temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the changes in the marginal effects of warming scenarios where the temperature of each month from June to August increases by 1°C.

(1) Inyld plant density 0.328^{***} (0.019) -0.007 (0.005) (0.005) t × plant density 0.001^{***} (0.000) tmin5 tmin5 0.173^{***} (0.031) (0.044) tmin7 0.200^{***} (0.039) (0.039) tmin8 -0.462^{***} (0.029) (0.029) tmax5 -0.025 (0.026) (0.026) tmax6 0.018 (0.042) (0.032) tmax7 0.194^{***} (0.031) (0.032) tmax8 0.315^{***} (0.028) (0.028) tmin5 × plant density -0.007^{***} (0.001) tmin6 × plant density -0.007^{***} (0.001) tmin8 × plant density -0.007^{***} (0.001) tmax5 × plant density -0.001^{***} (0.001) tmax6 × plant density -0.001^{***} (0.001) tmax7 × plant density -0.000^{***} (0.001) tmax6 × plant density		
lnyldplant density 0.328^{***} (0.019) tt -0.007 (0.005) t × plant density 0.001^{***} (0.000) tmin5 0.173^{***} (0.031) tmin6 -0.112^{**} (0.031) tmin7 0.200^{***} (0.039) tmin8 -0.462^{***} (0.033) tmin9 0.441^{***} (0.026) (0.029)tmax5 -0.025 (0.026) (0.026)tmax6 0.018 (0.042) (0.042)tmax7 0.194^{***} (0.032) (0.031)tmax8 0.315^{***} (0.031) -0.118^{***} (0.021) (0.001)tmin5 × plant density -0.004^{***} (0.001) (0.001)tmin8 × plant density 0.016^{***} (0.001) (0.001)tmax5 × plant density -0.007^{***} (0.001) (0.001)tmax5 × plant density -0.006^{***} (0.001) (0.001)tmax6 × plant density -0.006^{***} (0.001) (0.001)tmax7 × plant density -0.006^{***} (0.001) (0.001)tmax6 × plant density -0.006^{***} (0.001) (0.001)tmax8 × plant density -0.006^{***} (0.001) (0.001)tmax8 × plant density -0.006^{***} (0.001) (0.001)tmax9 × plant density -0.006^{***} (0.001) (0.001)<		(1)
plant density 0.328^{***} (0.019) t t -0.007 (0.005) t × plant density 0.001^{***} (0.000) tmin5 0.173^{***} (0.031) tmin6 -0.112^{**} (0.034) tmin7 0.200^{***} (0.039) tmin8 -0.462^{***} (0.033) tmin9 0.441^{***} (0.026) (0.029) tmax5 -0.025 (0.026) (0.042) tmax6 0.018 (0.042) (0.042) tmax7 0.194^{***} (0.032) (0.032) tmax8 0.315^{***} (0.028) (0.021) tmin5 × plant density -0.004^{***} (0.001) (0.001) tmin6 × plant density -0.007^{***} (0.001) (0.001) tmin8 × plant density 0.001^{***} (0.001) (0.001) tmax9 × plant density -0.006^{***} (0.001) (0.001) tmin9 × plant density -0.006^{***}		lnyld
t -0.007 (0.005) t × plant density 0.001^{***} (0.000) tmin5 0.173^{***} (0.031) tmin6 -0.112^{**} (0.044) tmin7 0.200^{***} (0.039) tmin8 -0.462^{***} (0.033) tmin9 0.441^{***} (0.029) tmax5 -0.025 (0.026) tmax6 0.018 (0.042) tmax7 0.194^{***} (0.031) tmax8 0.315^{***} (0.031) tmin5 × plant density -0.004^{***} (0.001) tmin7 × plant density -0.007^{***} (0.001) tmin8 × plant density -0.007^{***} (0.001) tmin9 × plant density -0.014^{***} (0.001) tmax5 × plant density -0.007^{***} (0.001) tmin7 × plant density -0.007^{***} (0.001) tmax5 × plant density -0.006^{***} (0.001) tmax5 × plant density -0.006^{***} (0.001) tmax6 × plant density -0.006^{***} (0.001) tmax8 × plant density 0.001^{***} (0.001) tmax9 × plant density 0.004^{***} (0.001)	plant density	0.328***
t-0.007 (0.005)t × plant density0.001*** (0.000)tmin50.173*** (0.031)tmin6-0.112** (0.044)tmin70.200*** (0.039)tmin8-0.462*** (0.033)tmin90.441*** (0.029)tmax5-0.025 (0.026)tmax60.018 (0.042)tmax70.194*** (0.031)tmin5 × plant density-0.004*** (0.021)tmin5 × plant density-0.004*** (0.001)tmin7 × plant density-0.007*** (0.001)tmin8 × plant density-0.016*** (0.001)tmax5 × plant density-0.007*** (0.001)tmin9 × plant density-0.014*** (0.001)tmax5 × plant density-0.007*** (0.001)tmin7 × plant density-0.007*** (0.001)tmax5 × plant density-0.006*** (0.001)tmax5 × plant density-0.006*** (0.001)tmax5 × plant density-0.006*** (0.001)tmax5 × plant density-0.006*** (0.001)tmax5 × plant density-0.006*** (0.001)tmax6 × plant density-0.006*** (0.001)tmax8 × plant density-0.006*** (0.001)tmax8 × plant density-0.006*** (0.001)tmax8 × plant density-0.006*** (0.001)tmax9 × plant density-0.006*** (0.001)		(0.019)
$\begin{array}{ccccc} (0.005) \\ t \times plant density & 0.001^{***} \\ & (0.000) \\ tmin5 & 0.173^{***} \\ & (0.031) \\ tmin6 & -0.112^{**} \\ & (0.044) \\ tmin7 & 0.200^{***} \\ & (0.039) \\ tmin8 & -0.462^{***} \\ & (0.033) \\ tmin9 & 0.441^{***} \\ & (0.029) \\ tmax5 & -0.025 \\ & (0.026) \\ tmax6 & 0.018 \\ & (0.042) \\ tmax7 & 0.194^{***} \\ & (0.032) \\ tmax8 & 0.315^{***} \\ & (0.032) \\ tmax8 & 0.315^{***} \\ & (0.032) \\ tmax8 & 0.315^{***} \\ & (0.031) \\ tmax9 & -0.118^{***} \\ & (0.028) \\ tmin5 \times plant density & 0.002 \\ & (0.001) \\ tmin7 \times plant density & -0.004^{***} \\ & (0.001) \\ tmin8 \times plant density & -0.014^{***} \\ & (0.001) \\ tmin9 \times plant density & -0.014^{***} \\ & (0.001) \\ tmax5 \times plant density & -0.014^{***} \\ & (0.001) \\ tmax5 \times plant density & -0.006^{***} \\ & (0.001) \\ tmax5 \times plant density & -0.006^{***} \\ & (0.001) \\ tmax6 \times plant density & -0.006^{***} \\ & (0.001) \\ tmax7 \times plant density & -0.006^{***} \\ & (0.001) \\ tmax8 \times plant density & -0.006^{***} \\ & (0.001) \\ tmax8 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.002^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.002^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\ & (0.001) \\ tmax9 \times plant density & -0.0012^{***} \\$	t	-0.007
t × plant density 0.001^{***} (0.000) tmin5 0.173^{***} (0.031) tmin6 -0.112^{**} (0.044) tmin7 0.200^{***} (0.039) tmin8 -0.462^{***} (0.033) tmin9 0.441^{***} (0.029) tmax5 -0.025 tmax6 0.018 (0.042) tmax7 0.194^{***} (0.032) tmax8 0.315^{***} (0.031) tmax9 -0.118^{***} (0.001) tmin5 × plant density -0.004^{***} (0.001) tmin5 × plant density -0.007^{***} (0.001) tmin5 × plant density -0.007^{***} (0.001) tmin8 × plant density -0.0014^{***} (0.001) tmax5 × plant density -0.0014^{***} (0.001) tmax5 × plant density -0.000 (0.001) tmax6 × plant density -0.006^{***} (0.001) tmax5 × plant density -0.006^{***} (0.001) tmax6 × plant density -0.006^{***} (0.001) (0.001)		(0.005)
tmin5 (0.000) tmin5 0.173^{***} (0.031) (0.031)tmin6 -0.112^{**} (0.044) (0.044)tmin7 0.200^{***} (0.039) (0.039)tmin8 -0.462^{***} (0.033) (0.029)tmax5 -0.025 (0.026) (0.026)tmax6 0.018 (0.042) (0.042)tmax7 0.194^{***} (0.031) (0.032)tmax8 0.315^{***} (0.031) (0.031)tmax9 -0.118^{***} (0.001) (0.001)tmin5 × plant density -0.004^{***} (0.001) (0.001)tmin7 × plant density -0.007^{***} (0.001) (0.001)tmin9 × plant density -0.014^{***} (0.001) (0.001)tmax6 × plant density -0.000 (0.001) (0.001)tmax7 × plant density -0.002^{***} (0.001) (0.001)tmax8 × plant density -0.012^{***} (0.001) (0.001)tmax8 × plant density -0.012^{***} (0.001) (0.001)tmax9 × plant density 0.004^{***} (0.001) (0.001)	t \times plant density	0.001^{***}
tmin5 0.173^{***} (0.031)tmin6 -0.112^{**} (0.044)tmin7 0.200^{***} (0.039)tmin8 -0.462^{***} (0.033)tmin9 0.441^{***} (0.029)tmax5 -0.025 (0.026)tmax6 0.018 (0.042)tmax7 0.194^{***} (0.032)tmax8 0.315^{***} (0.031)tmax9 -0.118^{***} (0.032)tmin5 × plant density -0.004^{***} (0.001)tmin7 × plant density 0.002 (0.002)tmin8 × plant density -0.007^{***} (0.001)tmin9 × plant density -0.014^{***} (0.001)tmax5 × plant density -0.014^{***} (0.001)tmin9 × plant density -0.014^{***} (0.001)tmax6 × plant density -0.006^{***} (0.001)tmax7 × plant density -0.001 (0.001)tmax7 × plant density -0.002^{***} (0.001)tmax8 × plant density -0.012^{***} (0.001)tmax9 × plant density -0.012^{***} (0.001)		(0.000)
$\begin{array}{llllllllllllllllllllllllllllllllllll$	$ mtext{tmin5}$	0.173***
tmin6 -0.112^{**} (0.044)tmin7 0.200^{***} (0.039)tmin8 -0.462^{***} (0.033)tmin9 0.441^{***} (0.029)tmax5 -0.025 (0.026)tmax6 0.018 (0.042)tmax7 0.194^{***} (0.032)tmax8 0.315^{***} (0.028)tmin5 × plant density -0.004^{***} (0.001)tmin6 × plant density 0.002 (0.002)tmin7 × plant density 0.007^{***} (0.001)tmin8 × plant density 0.016^{***} (0.001)tmin9 × plant density -0.014^{***} (0.001)tmax5 × plant density -0.014^{***} (0.001)tmax7 × plant density -0.006^{***} (0.001)tmax7 × plant density -0.006^{***} (0.001)tmax7 × plant density -0.006^{***} (0.001)tmax7 × plant density -0.006^{***} (0.001)tmax8 × plant density -0.006^{***} (0.001)tmax9 × plant density -0.012^{***} (0.001)tmax9 × plant density -0.006^{***} (0.001)		(0.031)
$\begin{array}{llllllllllllllllllllllllllllllllllll$	m tmin6	-0.112**
tmin7 0.200^{***} (0.039)tmin8 -0.462^{***} (0.033)tmin9 0.441^{***} (0.029)tmax5 -0.025 (0.026)tmax6 0.018 (0.042)tmax7 0.194^{***} (0.032)tmax8 0.315^{***} (0.028)tmin5 × plant density -0.004^{***} (0.001)tmin6 × plant density 0.002 (0.002)tmin7 × plant density 0.007^{***} (0.001)tmin8 × plant density 0.016^{***} (0.001)tmax5 × plant density 0.014^{***} (0.001)tmax5 × plant density -0.014^{***} (0.001)tmax6 × plant density -0.000 (0.001)tmax7 × plant density 0.001 (0.001)tmax7 × plant density -0.006^{***} (0.001)tmax8 × plant density -0.012^{***} (0.001)tmax8 × plant density -0.012^{***} (0.001)tmax9 × plant density -0.012^{***} (0.001)		(0.044)
$\begin{array}{llllllllllllllllllllllllllllllllllll$	tmin7	0.200***
tmin8 -0.462*** (0.033) (0.033) tmin9 0.441*** (0.029) (0.029) tmax5 -0.025 (0.026) (0.042) tmax7 0.194*** (0.032) (0.031) tmax9 -0.118*** (0.028) (0.028) tmin5 × plant density -0.002* tmin5 × plant density -0.002 (0.001) (0.001) tmin6 × plant density -0.007*** (0.001) (0.001) tmin8 × plant density -0.014*** (0.001) (0.001) tmax6 × plant density -0.000 (0.001) (0.001) tmax6 × plant density -0.001 (0.001) (0.001) tmax6 × plant density -0.006*** (0.001) (0.001) tmax6 × plant density -0.006*** (0.001) (0.001) tmax8 × plant density -0.012*** (0.001) (0.001)		(0.039)
$\begin{array}{llllllllllllllllllllllllllllllllllll$	tmin8	-0.462***
tmin9 0.441^{***} (0.029) tmax5 -0.025 (0.026) tmax6 0.018 (0.042) (0.042) tmax7 0.194^{***} (0.032) (0.032) tmax8 0.315^{***} (0.028) (0.028) tmin5 × plant density -0.004^{***} (0.001) (0.001) tmin6 × plant density -0.007^{***} (0.001) (0.001) tmin8 × plant density -0.016^{***} (0.001) (0.001) tmax5 × plant density -0.014^{***} (0.001) (0.001) tmax6 × plant density -0.000 (0.001) (0.001) tmax6 × plant density -0.006^{***} (0.001) (0.001) tmax7 × plant density -0.006^{***} (0.001) (0.001) tmax7 × plant density -0.012^{***} (0.001) (0.001)		(0.033)
$\begin{array}{llllllllllllllllllllllllllllllllllll$	tmin9	0.441***
tmax5 -0.025 (0.026) tmax6 0.018 (0.042) tmax7 0.194*** (0.032) tmax8 0.315*** (0.031) tmax9 -0.118*** (0.028) tmin5 × plant density -0.004*** (0.001) 0.002 tmin7 × plant density -0.007*** (0.001) 0.001 tmin8 × plant density -0.016*** (0.001) 0.001 tmin9 × plant density -0.014*** (0.001) (0.001) tmax5 × plant density -0.000 (0.001) (0.001) tmax7 × plant density -0.006*** (0.001) (0.001) tmax7 × plant density -0.006*** (0.001) (0.001) tmax8 × plant density -0.012*** (0.001) (0.001)		(0.029)
$\begin{array}{llllllllllllllllllllllllllllllllllll$	tmax5	-0.025
tmax6 0.018 (0.042) tmax7 0.194*** (0.032) tmax8 0.315*** (0.031) tmax9 -0.118*** (0.0028) tmin5 × plant density -0.004*** (0.001) tmin6 × plant density 0.002 tmin7 × plant density -0.007*** (0.001) 1 tmin9 × plant density -0.016*** (0.001) 1 tmax5 × plant density -0.014*** (0.001) 1 tmax6 × plant density -0.000 (0.001) 1 tmax7 × plant density -0.006*** (0.001) 1 tmax8 × plant density -0.012*** (0.001) 1 tmax9 × plant density -0.012*** (0.001) 1		(0.026)
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	tmax6	0.018
tmax7 0.194^{***} (0.032) tmax8 0.315^{***} (0.031) tmax9 -0.118^{***} (0.028) tmin5 × plant density -0.004^{***} (0.001) tmin6 × plant density 0.002 tmin7 × plant density -0.007^{***} (0.001) tmin8 × plant density -0.016^{***} (0.001) tmin9 × plant density -0.014^{***} (0.001) tmax5 × plant density -0.000 (0.001) tmax7 × plant density -0.006^{***} (0.001) tmax8 × plant density -0.006^{***} (0.001) tmax9 × plant density -0.002^{***}		(0.042)
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	tmax7	0.194***
tmax8 0.315^{***} (0.031) tmax9 tmax9 -0.118^{***} (0.028) 0.0028 tmin5 × plant density -0.004^{***} (0.001) 0.002 tmin6 × plant density 0.002 tmin7 × plant density -0.007^{***} (0.001) 0.001 tmin8 × plant density -0.016^{***} (0.001) 0.001 tmin9 × plant density -0.014^{***} (0.001) 0.001 tmax5 × plant density -0.000 (0.001) 0.001 tmax7 × plant density -0.006^{***} (0.001) 0.001^{***} tmax8 × plant density -0.012^{***} (0.001) 0.004^{***} (0.001) 0.004^{***}		(0.032)
$\begin{array}{rcl} (0.031) \\ (0.031) \\ -0.118^{***} \\ (0.028) \\ \\ tmin5 \times plant density & -0.004^{***} \\ (0.001) \\ tmin6 \times plant density & 0.002 \\ (0.002) \\ \\ tmin7 \times plant density & -0.007^{***} \\ (0.001) \\ \\ tmin8 \times plant density & 0.016^{***} \\ (0.001) \\ \\ tmin9 \times plant density & -0.014^{***} \\ (0.001) \\ \\ tmax5 \times plant density & -0.000 \\ (0.001) \\ \\ tmax6 \times plant density & -0.000 \\ (0.001) \\ \\ tmax7 \times plant density & -0.006^{***} \\ (0.001) \\ \\ tmax8 \times plant density & -0.012^{***} \\ (0.001) \\ \\ tmax9 \times plant density & 0.004^{***} \\ (0.001) \\ \end{array}$	tmax8	0.315***
$\begin{array}{rcl} & (0.001) \\ tmax9 & -0.118^{***} \\ & (0.028) \\ tmin5 \times plant density & -0.004^{***} \\ & (0.001) \\ tmin6 \times plant density & 0.002 \\ & (0.002) \\ tmin7 \times plant density & -0.007^{***} \\ & (0.001) \\ tmin8 \times plant density & 0.016^{***} \\ & (0.001) \\ tmax5 \times plant density & -0.014^{***} \\ & (0.001) \\ tmax5 \times plant density & -0.000 \\ & (0.001) \\ tmax7 \times plant density & -0.006^{***} \\ & (0.001) \\ tmax7 \times plant density & -0.012^{***} \\ & (0.001) \\ tmax8 \times plant density & -0.012^{***} \\ & (0.001) \\ tmax9 \times plant density & 0.004^{***} \\ & (0.001) \\ \end{array}$		(0.031)
$\begin{array}{rl} (0.028) \\ \text{tmin5} \times \text{plant density} & -0.004^{***} \\ (0.001) \\ \text{tmin6} \times \text{plant density} & 0.002 \\ (0.002) \\ \text{tmin7} \times \text{plant density} & -0.007^{***} \\ (0.001) \\ \text{tmin8} \times \text{plant density} & 0.016^{***} \\ (0.001) \\ \text{tmin9} \times \text{plant density} & -0.014^{***} \\ (0.001) \\ \text{tmax5} \times \text{plant density} & -0.000 \\ (0.001) \\ \text{tmax6} \times \text{plant density} & -0.000 \\ (0.001) \\ \text{tmax7} \times \text{plant density} & -0.006^{***} \\ (0.001) \\ \text{tmax8} \times \text{plant density} & -0.012^{***} \\ (0.001) \\ \text{tmax9} \times \text{plant density} & 0.004^{***} \\ (0.001) \\ \end{array}$	tmax9	-0.118***
tmin5 × plant density -0.004*** (0.001) (0.001) tmin6 × plant density 0.002 (0.002) (0.002) tmin7 × plant density -0.007*** (0.001) (0.001) tmin8 × plant density 0.016*** (0.001) (0.001) tmin9 × plant density -0.014*** (0.001) (0.001) tmax5 × plant density -0.000 (0.001) (0.001) tmax7 × plant density -0.006*** (0.001) tmax8 × plant density tmax9 × plant density 0.004*** (0.001) (0.001)		(0.028)
$\begin{array}{ccccc} & (0.001) \\ \text{tmin6} \times \text{plant density} & 0.002 \\ & (0.002) \\ \text{tmin7} \times \text{plant density} & -0.007^{***} \\ & (0.001) \\ \text{tmin8} \times \text{plant density} & 0.016^{***} \\ & (0.001) \\ \text{tmin9} \times \text{plant density} & -0.014^{***} \\ & (0.001) \\ \text{tmax5} \times \text{plant density} & -0.000 \\ & (0.001) \\ \text{tmax6} \times \text{plant density} & -0.001 \\ & (0.001) \\ \text{tmax7} \times \text{plant density} & -0.006^{***} \\ & (0.001) \\ \text{tmax8} \times \text{plant density} & -0.012^{***} \\ & (0.001) \\ \text{tmax9} \times \text{plant density} & 0.004^{***} \\ & (0.001) \\ \end{array}$	$tmin5 \times plant density$	-0.004***
$\begin{array}{llllllllllllllllllllllllllllllllllll$	I I I I I I I I I I I I I I I I I I I	(0.001)
$\begin{array}{rl} (0.002) \\ (0.002) \\ tmin7 \times plant density \\ (0.001) \\ tmin8 \times plant density \\ (0.001) \\ tmin9 \times plant density \\ (0.001) \\ tmax5 \times plant density \\ (0.001) \\ tmax6 \times plant density \\ (0.001) \\ tmax7 \times plant density \\ (0.001) \\ tmax7 \times plant density \\ (0.001) \\ tmax8 \times plant density \\ (0.001) \\ tmax9 \times plan$	$tmin6 \times plant density$	0.002
$\begin{array}{llllllllllllllllllllllllllllllllllll$	1 0	(0.002)
$\begin{array}{cccc} (0.001) \\ (0.001) \\ tmin8 \times plant density & 0.016^{***} \\ (0.001) \\ tmin9 \times plant density & -0.014^{***} \\ (0.001) \\ tmax5 \times plant density & -0.000 \\ (0.001) \\ tmax6 \times plant density & 0.001 \\ (0.001) \\ tmax7 \times plant density & -0.006^{***} \\ (0.001) \\ tmax8 \times plant density & -0.012^{***} \\ (0.001) \\ tmax9 \times plant density & 0.004^{***} \\ (0.001) \end{array}$	$tmin7 \times plant density$	-0.007***
tmin8 × plant density 0.016^{***} (0.001) (0.001) tmin9 × plant density -0.014^{***} (0.001) (0.001) tmax5 × plant density -0.000 (0.001) (0.001) tmax6 × plant density 0.001 tmax7 × plant density -0.006^{***} (0.001) tmax8 × plant density tmax9 × plant density 0.004^{***} (0.001) (0.001)	I I I I I I I I I I I I I I I I I I I	(0.001)
$\begin{array}{rl} (0.001) \\ (0.001) \\ tmin9 \times plant density \\ tmax5 \times plant density \\ tmax5 \times plant density \\ tmax6 \times plant density \\ tmax7 \times plant density \\ tmax7 \times plant density \\ tmax8 \times plant density \\ tmax9 \times plant density \\ tm$	$tmin8 \times plant density$	0.016***
$\begin{array}{rl} \mbox{tmin9} \times \mbox{plant density} & -0.014^{***} \\ & (0.001) \\ \mbox{tmax5} \times \mbox{plant density} & -0.000 \\ & (0.001) \\ \mbox{tmax6} \times \mbox{plant density} & 0.001 \\ & (0.001) \\ \mbox{tmax7} \times \mbox{plant density} & -0.006^{***} \\ & (0.001) \\ \mbox{tmax8} \times \mbox{plant density} & -0.012^{***} \\ & (0.001) \\ \mbox{tmax9} \times \mbox{plant density} & 0.004^{***} \\ & (0.001) \\ \end{array}$	I	(0.001)
$\begin{array}{c} (0.001) \\$	tmin9 \times plant density	-0.014***
$\begin{array}{ll} {\rm tmax5 \times plant \ density} & -0.000 \\ & (0.001) \\ {\rm tmax6 \times plant \ density} & 0.001 \\ & (0.001) \\ {\rm tmax7 \times plant \ density} & -0.006^{***} \\ & (0.001) \\ {\rm tmax8 \times plant \ density} & -0.012^{***} \\ & (0.001) \\ {\rm tmax9 \times plant \ density} & 0.004^{***} \\ & (0.001) \end{array}$	······································	(0.001)
$\begin{array}{llllllllllllllllllllllllllllllllllll$	$tmax5 \times plant$ density	-0.000
tmax6 × plant density 0.001 (0.001) tmax7 × plant density -0.006^{***} (0.001) tmax8 × plant density -0.012^{***} (0.001) tmax9 × plant density 0.004^{***} (0.001)	finano , prano accisioj	(0.001)
$\begin{array}{llllllllllllllllllllllllllllllllllll$	$tmax6 \times plant density$	0.001
$\begin{array}{rl} (0.001)\\ \text{tmax7}\times\text{plant density} & -0.006^{***}\\ & (0.001)\\ \text{tmax8}\times\text{plant density} & -0.012^{***}\\ & (0.001)\\ \text{tmax9}\times\text{plant density} & 0.004^{***}\\ & (0.001)\end{array}$	Provide Provide Street	(0.001)
$\begin{array}{c} (0.001)\\ (0.001)\\ \text{tmax8} \times \text{plant density} & -0.012^{***}\\ (0.001)\\ \text{tmax9} \times \text{plant density} & 0.004^{***}\\ (0.001)\end{array}$	$tmax7 \times plant density$	-0.006***
$\begin{array}{l} (0.001) \\ \text{tmax8} \times \text{plant density} & -0.012^{***} \\ (0.001) \\ \text{tmax9} \times \text{plant density} & 0.004^{***} \\ (0.001) \end{array}$	provide a company	(0.001)
$\begin{array}{c} (0.001)\\ \text{tmax9} \times \text{plant density} & 0.004^{***}\\ (0.001)\end{array}$	$tmax8 \times plant density$	-0.012***
tmax9 × plant density 0.004^{***} (0.001)	promo domoroj	(0.001)
(0.001)	$tmax9 \times plant density$	0.004***
	p-main addition of	(0.001)

Continued	
PDSI5(wet)	-0.030
~ /	(0.036)
PDSI6(wet)	-0.199***
× ,	(0.042)
PDSI7(wet)	0.170^{***}
	(0.030)
PDSI8(wet)	-0.467^{***}
	(0.037)
PDSI9(wet)	0.014
	(0.036)
PDSI5(dry)	-1.475***
	(0.067)
PDSI6(dry)	1.946***
	(0.120)
PDSI7(dry)	-0.005
	(0.086)
r DSI8(dry)	-1.414 (0.086)
PDSIQ(dry)	-0.624***
i Dois(ury)	(0.024)
$PDSI5(wet) \times plant density$	-0.000
	(0.001)
$PDSI6(wet) \times plant density$	0.007***
· · · · · ·	(0.001)
$PDSI7(wet) \times plant density$	-0.006***
	(0.001)
$PDSI8(wet) \times plant density$	0.016^{***}
	(0.001)
$PDSI9(wet) \times plant density$	-0.000
	(0.001)
$PDSI5(dry) \times plant density$	0.051^{***}
	(0.002)
$PDSI6(dry) \times plant density$	-0.067
PDSI7(dry) v plant dansity	(0.004)
$1 DSIT(ury) \times plant density$	(0,003)
$PDSI8(drv) \times plant density$	0.048***
$1 \text{Doto}(\operatorname{ar} y) \land \operatorname{prante defibility}$	(0.003)
$PDSI9(drv) \times plant densitv$	0.022***
	(0.003)

Continued	
1 if previous crop is corn	0.089***
	(0.026)
RW	0.036***
	(0.004)
other GM	0.039***
	(0.003)
1 if previous crop is wheat	0.128***
	(0.027)
1 if previous crop is alfalfa or alfalfa/hay	0.193***
	(0.026)
1 if previous crop is soybean	0.102***
	(0.026)
1 if previous crop is lupine	-0.175***
	(0.035)
fall tillage, 1 if yes, 0 if no	0.000
	(0.002)
spring tillage, 1 if yes, 0 if no	-0.038***
	(0.004)
apply insecticide, 1 if yes, 0 if no	-0.063***
	(0.004)
fertilizer N	0.000***
	(0.000)
Observations	28521
R-squared	0.662

Notes: Table regresses plot-level log of yield on plant density, weather variables(monthly average of daily minimum and maximum temperature(**tmin** and **tmax**), and monthly PDSI from May to September), the interactions between plant density and weather variables, and the managerial inputs and practices described in Table 1. The model also includes linear time trend, and production zone fixed effect model. The density effect is allowed to vary across years by including the interaction between plant density and time trend. Units for **tmin** and **tmax** are °C. Unit for plant density is 1000 acre⁻¹. In consideration of the possible heteroskedasticity, Huber-White's robust standard errors are calculated and shown in parentheses. ***Significant at 1% level. **Significant at 5% level.

	All Mo	All Months		Aug
	Estimates	P-value	Estimates	P-value
tmin & tmax	-0.0191	0.000	-0.0053	0.000
tmin	-0.0069	0.000	0.0110	0.000
tmax	-0.0122	0.000	-0.0163	0.000

Table S6: Estimated changes in the effects of plant density on yield as a result of $1^{\circ}C$ warming

Notes: (1) The table shows the results of the second robustness check (the model specification includes the interaction term between plant density and the time trend in addition to the independent variables of the main specification). (2) The first column indicates what weather variables the marginal effects of plant density are based on. The first row indicates a 1°C increase in both **tmin** and **tmax**. The second row refers to a warming scenario where only **tmin** increases by 1°C. The third row refers to a 1°C increase in **tmax**. (3) The second and the third column report coefficients and p-values of the changes in the marginal effects of plant density as a result of warming scenarios (both **tmin** and **tmax**, and **tmin** and **tmax** separately) where the temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the changes in the marginal effects of warming scenarios where the temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the changes in the marginal effects of warming scenarios where the temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the changes in the marginal effects of warming scenarios where the temperature of each month from June to August increases by 1°C.

	(1)
-lt-lit	Inyld
plant density	(0.020)
tmin5	(0.020) 0.125***
timiio	(0.021)
tmin6	(0.031) 0 501***
timito	(0.042)
tmin7	(0.042)
	(0.034)
tmin8	-0 133***
	(0.030)
tmin9	0.615***
	(0.034)
tmax5	-0.043*
	(0.023)
tmax6	0.405***
	(0.029)
tmax7	0.210***
	(0.032)
tmax8	0.058^{**}
	(0.028)
tmax9	-0.272^{***}
	(0.026)
tmin5 \times plant density	-0.003***
	(0.001)
tmin6 \times plant density	0.016***
	(0.001)
$tmin7 \times plant density$	-0.001
	(0.001)
$tmin8 \times plant density$	0.004^{***}
toring of a least day sites	(0.001)
$tmin9 \times plant density$	-0.021
tmar 5 v plant dangity	(0.001)
$\tan x_3 \times \operatorname{praint density}$	(0.001)
tmax6 × plant density	-0.012***
tinaxo × plant density	(0.012)
tmax7 \times plant density	-0.008***
cincar, x prene denoity	(0.001)
$tmax8 \times plant density$	-0.002**
1 U	(0.001)
$tmax9 \times plant density$	0.010***
1	(0.001)
prec	0.030***
	(0.007)
prec \times plant density	-0.001***
	(0.000)
prec \times prec \times plant density	0.000^{***}
	(0.000)

Table S7: Regression results of the model using a quadratic form of precipitation as measure of water availability

Continued	
year	$\begin{array}{c} 0.011^{***} \\ (0.000) \end{array}$
RW	$\begin{array}{c} 0.034^{***} \\ (0.005) \end{array}$
other GM	0.026^{***} (0.003)
1 if previous crop is corn	$0.023 \\ (0.025)$
1 if previous crop is wheat	0.094^{***} (0.025)
1 if previous crop is alfalfa or alfalfa/hay	$\begin{array}{c} 0.125^{***} \\ (0.024) \end{array}$
1 if previous crop is soybean	$0.004 \\ (0.024)$
1 if previous crop is lupine	-0.177^{***} (0.040)
fall tillage, 1 if yes, 0 if no	-0.027^{***} (0.003)
spring tillage, 1 if yes, 0 if no	-0.005 (0.003)
apply insectic ide, 1 if yes, 0 if no	-0.057^{***} (0.003)
fertilizer N	0.000^{***} (0.000)
Observations	$28\overline{521}$
R-squared	0.627

Notes: Table regresses plot-level log of yield on plant density, weather variables(monthly average of daily minimum and maximum temperature(**tmin** and **tmax**), and a quadratic form of the mean of monthly cumulative precipitation for the whole growing season, the interactions between plant density and weather variables, and the managerial inputs and practices described in Table 1. The model also includes linear time trend and production zone fixed effect model. Units for **tmin** and **tmax** are °C. Unit for plant density is 1000 acre⁻¹. In consideration of the possible heteroskedasticity, Huber-White's robust standard errors are calculated and shown in parentheses. ***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.

	All Mc	All Months		Aug
	Estimates	P-value	Estimates	P-value
tmin & tmax	-0.0161	0.000	-0.0030	0.000
tmin	-0.0049	0.000	0.0190	0.000
tmax	-0.0112	0.000	-0.0220	0.000

Table S8: Estimated changes in the effects of plant density on yield as a result of $1^{\circ}C$ warming

Notes: (1) The table shows the results of the third robustness check which replaces PDSI as a measure of water availability with a quadratic form of the mean of monthly cumulative precipitation for the whole growing season. (2) The first column indicates what weather variables the marginal effects of plant density are based on. The first row indicates a 1°C increase in both **tmin** and **tmax**. The second row refers to a warming scenario where only **tmin** increases by 1°C. The third row refers to a 1°C increase in **tmax**. (3) The second and the third column report coefficients and p-values of the changes in the marginal effects of plant density as a result of warming scenarios (both **tmin** and **tmax**, and **tmin** and **tmax** separately) where the temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the changes in the marginal effects of warming scenarios where the temperature of each month from June to August increases by 1°C.

	(1) lnyld
planting density	0.516***
planting density	(0.047)
PW v planting density	(0.047) 1.617***
$\mathbf{K}\mathbf{W}$ × planning density	-1.017
other CM × plenting density	(0.091)
other GW × planting density	(0.022)
tmin5	(0.070)
timito	(0.255)
tmin6	(0.037)
UIIIIIO	-0.373
tmin7	(0.091)
01111117	$-0.010^{-0.011}$
tminQ	(0.001)
0111110	(0.040)
tmin0	(0.049)
0111119	(0.042)
tmax5	(0.042)
tinax5	-0.180
tmax6	(0.048) 0 402***
tillax0	(0.493)
tmax7	(0.010)
tillaxi	(0.043)
tmax8	-0 330***
unaxo	(0.000)
tmax9	0.161***
	(0.036)
$t_{min5} \times planting density$	-0.008***
chilling of producing density	(0.002)
$tmin6 \times planting density$	0.019***
······································	(0.003)
$tmin7 \times planting density$	0.023***
	(0.002)
$tmin8 \times planting density$	-0.014***
	(0.002)
$tmin9 \times planting density$	-0.012***
	(0.002)
$tmax5 \times planting density$	0.006***
	(0.002)
$tmax6 \times planting density$	-0.016***
	(0.002)
tmax7 \times planting density	-0.016***
	(0.002)
tmax8 \times planting density	0.013^{***}
	(0.002)
tmax9 \times planting density	-0.005***
	(0.001)

Table S9: Regression results of the model specification measuring water availability with a quadratic form of precipitation

Continued

$RW \times tmin5$	-0.524***
	(0.141)
$RW \times tmin6$	1.353^{***}
	(0.182)
$RW \times tmin7$	-0.146
	(0.236)
$RW \times tmin8$	0.277
	(0.208)
$RW \times tmin9$	0.057
	(0.210)
other GM \times tmin5	-0.567^{***}
	(0.108)
other GM \times tmin6	0.629^{***}
	(0.128)
other GM \times tmin7	1.385^{***}
	(0.096)
other GM \times tmin8	0.214^{**}
	(0.103)
other GM \times tmin9	-0.920***
	(0.111)
$RW \times tmax5$	0.586^{***}
	(0.147)
$RW \times tmax6$	-0.430**
.	(0.184)
$RW \times tmax7$	0.155
	(0.153)
$RW \times tmax8$	-1.131***
DIII	(0.185)
$RW \times tmax9$	-0.667***
	(0.171)
other $GM \times tmax_5$	0.397***
	(0.088)
other $GM \times tmaxb$	$-1.2(4^{++})$
	(0.119)
other $GM \times tmax$	$-0.404^{-0.404}$
other CM v to and	(U.U//) 0.916**
other $GM \times tmax8$	(0.0210°)
other CM v tracero	(0.089)
other $GM \times tmax9$	(0, 0, 0, 0)
	(0.089)

$\alpha + 1$
Continued
Commutation

$RW \times tmin5 \times planting density$	0.018***
	(0.005)
RW \times tmin6 \times planting density	-0.050***
	(0.006)
RW \times tmin7 \times planting density	0.002
	(0.008)
$RW \times tmin8 \times planting density$	-0.002
	(0.007)
$RW \times tmin9 \times planting density$	-0.004
	(0.007)
RW \times tmax5 \times planting density	-0.023***
	(0.005)
RW \times tmax6 \times planting density	0.015^{**}
	(0.006)
$RW \times tmax7 \times planting density$	-0.004
	(0.005)
$RW \times tmax8 \times planting density$	0.036***
	(0.006)
RW \times tmax9 \times planting density	0.025***
	(0.006)
other GM \times tmin5 \times planting density	0.018***
	(0.004)
other GM \times tmin6 \times planting density	-0.023***
	(0.004)
other GM \times tmin7 \times planting density	-0.049***
	(0.003)
other GM \times tmin8 \times planting density	-0.002
	(0.004)
other GM \times tmin9 \times planting density	0.029^{***}
	(0.004)
other GM \times tmax 5 \times planting density	-0.014***
	(0.003)
other GM \times tmax 6 \times planting density	0.043^{***}
	(0.004)
other GM \times tmax 7 \times planting density	0.017^{***}
	(0.003)
other GM \times tmax8 \times planting density	-0.010***
	(0.003)
other GM \times tmax 9 \times planting density	-0.004
	(0.003)

prec	0.124^{***}
	(0.017)
$\operatorname{prec} \times \operatorname{prec}$	-0.001^{***}
	(0.000)
prec \times planting density	-0.004^{***}
	(0.001)
prec \times prec \times planting density	0.000***
	(0.000)
$RW \times prec$	-0.517^{***}
	(0.029)
other GM \times prec	-0.042^{*}
	(0.023)
$RW \times prec \times prec$	0.002^{***}
	(0.000)
other GM \times prec \times prec	0.000^{*}
	(0.000)
$RW \times prec \times prec \times planting density$	-0.000***
	(0.000)
other GM \times prec \times prec \times planting density	-0.000**
	(0.000)
pcorn	0.047^{*}
	(0.027)
1 if previous crop is wheat	0.113^{***}
	(0.027)
1 if previous crop is alfalfa or alfalfa/hay	0.166^{***}
	(0.026)
1 if previous crop is soybean	0.044^{*}
	(0.026)
1 if previous crop is lupine	-0.067*
	(0.038)
fall tillage, 1 if yes, 0 if no	-0.037***
	(0.003)
spring tillage, 1 if yes, 0 if no	0.006
	(0.003)
apply insecticide, 1 if yes, 0 if no	-0.055***
	(0.004)
fertilizern N	0.000***
	(0.000)
Observations	28521
R-squared	0.665

Continued

Notes: Table regresses plot-level log of yield on plant density, weather variables(monthly average of daily minimum and maximum temperature(**tmin** and **tmax**), and a quadratic form of the mean of monthly cumulative precipitation for the whole growing season), GM variety dummies, and managerial inputs and practices. The specification also includes linear time trend, production fixed effect and the interactions among plant density, weather variables, and GM variety dummies. Units for **tmin** and **tmax** are °C. Unit for plant density is 1000 acre⁻¹. In consideration of the possible heteroskedasticity, Huber-White's robust standard errors are calculated and shown in parentheses. ***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.

		All months		Jun-A	Aug
		Estimates	P-value	Estimates	P-value
tmin & tmax	Conventional	-0.0104	0.000	0.0084	0.000
	GM-RW	0.0018	0.547	0.0051	0.331
	other GM	-0.0053	0.030	-0.0151	0.000
tmin	Conventional	0.0086	0.000	0.0280	0.000
	GM-RW	-0.0282	0.000	-0.0222	0.001
	other GM	-0.0176	0.000	-0.0456	0.000
tmax	Conventional	-0.0190	0.000	-0.0197	0.000
	GM-RW	0.0300	0.000	0.0272	0.000
	other GM	0.0123	0.000	0.0305	0.000

Table S10: Estimated changes in the effects of plant density on yield as a result of $1^{\circ}\mathrm{C}$ warming

Notes: (1) The table displays coefficients and p-values of the change in the marginal effect of plant density as a result of 1° warming. The results are calculated from the estimated results of the model specification in equations (1) and (8) that replaces monthly PDSI as a measure of water availability with a quadratic form of the mean of monthly cumulative precipitation for the whole growing season. (2) The first column indicates what weather variables are the marginal effects of plant density based on. The first row of the first panel indicates a 1°C increase in both **tmin** and **tmax**. The first row of the second panel refers to a scenario where only **tmin** increases by 1°C. The first row of the third panel refers to a situation where only **tmax** increases by 1°C. (3) The second column indicates the hybrid groups: "RW" is GM hybrids expressing Bt trait for corn rootworm. "other GM" refer to GM hybrids without Bt trait for corn rootworm. (4)The third and fourth column report coefficients and p-values of the change in marginal effect of plant density as a result of warming scenarios (both **tmin** and **tmax**, and **tmin** and **tmax** separately) where temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the change in the marginal effect of warming scenarios where the temperature of each month from June to August increases by 1°C.

	lpreld
plant density	0.083***
plane density	(0.000)
tmin5	(0.022) 0.457***
0111110	(0.43)
tmin6	(0.015)
	(0.055)
tmin7	-0.105**
	(0.049)
tmin8	-0.470***
	(0.038)
tmin9	0.354***
	(0.033)
tmax5	-0.316***
	(0.033)
tmax6	0.315***
	(0.044)
tmax7	0.153^{***}
	(0.037)
tmax8	0.168^{***}
	(0.037)
tmax9	-0.229^{***}
	(0.032)
tmin5 \times plant density	-0.016***
	(0.001)
$tmin6 \times plant density$	-0.003
	(0.002)
$tmin7 \times plant density$	0.003*
	(0.002)
$tmin8 \times plant density$	0.017^{***}
	(0.001)
$tmin9 \times plant density$	-0.012^{***}
	(0.001)
$tmax_{2} \times plant density$	(0.010^{-1})
tmark v plant dangiter	(0.001)
$\tan x \sigma \times \operatorname{prant} \operatorname{density}$	-0.010
tmax7 × plant donsity	(0.002) 0.003**
$\tan x$ plant density	-0.003
tmax8 × plant density	-0.008***
mano ~ piant density	(0.000)
tmax9 × plant density	0.008***
mano A plant ucusity	(0.000)
	(0.001)

Table S11: Regression results of the model controlling for year fixed effects

Continued	
PDSI5(wet)	0.011
	(0.039)
PDSI6(wet)	-0.146***
	(0.048)
PDSI7(wet)	0.243***
× /	(0.034)
PDSI8(wet)	-0.695***
	(0.043)
PDSI9(wet)	0.132^{***}
	(0.039)
PDSI5(dry)	-1.180***
	(0.071)
PDSI6(dry)	1.252^{***}
	(0.140)
PDSI7(dry)	0.669***
	(0.105)
PDSI8(dry)	-0.773***
	(0.099)
PDSI9(dry)	-0.965***
	(0.087)
$PDSI5(wet) \times plant density$	-0.000
	(0.001)
$PDSIG(wet) \times plant density$	(0.005°)
DDCI7(wet) × plant density	(0.002)
$PDSI7(wet) \times plant density$	-0.009
PDSI8(wet) × plant density	(0.001) 0.025***
$1 \text{ DSIG(wet)} \times \text{prant density}$	(0.025)
$PDSIQ(wet) \times plant density$	-0.004***
$1 DS13(wet) \times plant density$	(0,001)
$PDSI5(drv) \times plant density$	0.041***
T Dois(ary) × prant density	(0.002)
$PDSI6(drv) \times plant density$	-0.038***
	(0.005)
$PDSI7(drv) \times plant density$	-0.029***
	(0.004)
$PDSI8(dry) \times plant density$	0.025^{***}
	(0.003)
$PDSI9(dry) \times plant density$	0.034***
	(0.003)

Continued				
RW	0.047***			
	(0.005)			
	· · · ·			
other GM	0.046***			
	(0.003)			
1 if provious grop is corp	0 150***			
1 if previous crop is com	(0.139)			
	(0.020)			
1 if previous crop is wheat	0.148^{***}			
	(0.028)			
1 if previous crop is alfalfa or alfalfa/hay	0.261^{***}			
	(0.027)			
1 if provious grop is soupeon	0 165***			
1 if previous crop is soybean	(0.105)			
	(0.021)			
1 if previous crop is lupine	-0.223***			
	(0.036)			
fall tillage, 1 if yes, 0 if no	-0.006**			
	(0.003)			
spring tillage 1 if yes 0 if no	-0 020***			
spring tinage, r ir yes, o ir no	(0.020)			
	(0.001)			
apply insecticide, 1 if yes, 0 if no	-0.059***			
	(0.004)			
	0 000444			
tertilizer N	0.000^{***}			
	(0.000)			
Upservations Deservations	28521			
K-squared	0.089			

Notes: Table regresses plot-level log of yield on plant density, weather variables(monthly average of daily minimum and maximum temperature(**tmin** and **tmax**), and monthly PDSI from May to September), the interactions between plant density and weather variables, and the managerial inputs and practices described in Table 1. The model also includes year fixed effects and production zone fixed effect model. Units for **tmin** and **tmax** are °C. Unit for plant density is 1000 acre⁻¹. In consideration of the possible heteroskedasticity, Huber-White's robust standard errors are calculated and shown in parentheses. ***Significant at 1% level. **Significant at 5% level.

Table S12: Estimated changes in the effects of plant density on yield as a result of $1^{\circ}C$ warming

	All Months		Jun-A	lug	
	Estimates	P-value		Estimates	P-value
tmin & tmax	-0.012	0.000	-0.002		0.052
tmin	-0.010	0.000	0.018		0.000
tmax	-0.002	0.084	-0.020		0.000

Notes: (1) The results here are estimated through our main specification in equations (1) and (2) but replacing linear time trend with year fixed effects. (2) The first column indicates what weather variables the marginal effects of plant density are based on. The first row indicates a 1°C increase in both **tmin** and **tmax**. The second row refers to a warming scenario where only **tmin** increases by 1°C. The third row refers to a 1°C increase in **tmax**. (3) The second and the third column report coefficients and p-values of the changes in the marginal effects of plant density as a result of warming scenarios (both **tmin** and **tmax**, and **tmin** and **tmax** separately) where temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the changes in the marginal effects of warming scenarios where the temperature of each month from June to August increases by 1°C.

	lnyld
plant density	0.123***
	(0.025)
plant density \times plant density	0.004^{***}
	(0.000)
tmin5	0.051
	(0.034)
tmin6	0.259^{***}
	(0.055)
tmin7	0.151^{***}
	(0.039)
tmin8	-0.553^{***}
	(0.033)
tmin9	0.424^{***}
	(0.029)
tmax5	0.134^{***}
	(0.030)
tmax6	-0.193^{***}
	(0.046)
tmax7	0.232^{***}
	(0.031)
tmax8	0.333^{***}
	(0.030)
tmax9	-0.151***
	(0.027)
tmin5 \times plant density	0.000
	(0.001)
tmin6 \times plant density	-0.011***
	(0.002)
tmin7 \times plant density	-0.005***
	(0.001)
tmin8 \times plant density	0.019***
	(0.001)
tmin9 \times plant density	-0.013***
	(0.001)
$tmax5 \times plant density$	-0.006***
	(0.001)
$tmax6 \times plant density$	0.009***
	(0.002)
$tmax \gamma \times plant density$	-0.007***
	(0.001)
tmax8 \times plant density	-0.012^{***}
	(0.001)
tmax9 \times plant density	(0.000^{+++})
	(0.001)

Table S12 Regression	regults of the mode	l including	aundratic torm	of plant dongity
Table 515. Regression	i results of the mou	si meruunig v	quadratic term	or plant density

Continued				
PDSI5(wet)	0.255***			
	(0.041)			
PDSI6(wet)	-0.485***			
	(0.048)			
PDSI7(wet)	0.244^{***}			
	(0.030)			
PDSI8(wet)	-0.441***			
	(0.038)			
PDSI9(wet)	-0.031			
	(0.037)			
PDS15(dry)	-1.558***			
	(0.067)			
PDSI6(dry)	2.179^{***}			
DDCI7(drag)	(0.120)			
PDSI7(dry)	-0.031			
DDSI8(dry)	(0.004) 1.650***			
1 D516(d1y)	(0.087)			
PDSI9(dry)	-0.387***			
1 D515(d1y)	(0.078)			
$PDSI5(wet) \times plant density$	-0.010***			
	(0.001)			
$PDSI6(wet) \times plant density$	0.017***			
	(0.002)			
$PDSI7(wet) \times plant density$	-0.009***			
	(0.001)			
$PDSI8(wet) \times plant density$	0.016^{***}			
	(0.001)			
$PDSI9(wet) \times plant density$	0.001			
	(0.001)			
$PDSI5(dry) \times plant density$	0.054***			
	(0.002)			
$PDSI6(dry) \times plant density$	-0.075***			
	(0.004)			
$PDSI7(dry) \times plant density$	-0.002			
DDCIO(dara) y alarat darasta	(0.003)			
$PDSI8(ary) \times plant density$	0.00)			
PDSIQ(dry) × plant donsity	(0.003 <i>)</i> 0.01 <i>4</i> ***			
$1 \text{Dots}(\text{dis}) \land \text{plant density}$	(0.014)			
	(0.000)			

Continued				
RW	$\begin{array}{c} 0.037^{***} \\ (0.004) \end{array}$			
other GM	0.042^{***} (0.003)			
year	0.008^{***} (0.000)			
1 if previous crop is corn	0.064^{**} (0.026)			
1 if previous crop is wheat	0.103^{***} (0.027)			
1 if previous crop is alfalfa or alfalfa/hay	0.165^{***} (0.026)			
1 if previous crop is soybean	0.072^{***} (0.026)			
1 if previous crop is lupine	-0.173^{***} (0.032)			
fall tillage, 1 if yes, 0 if no	-0.002 (0.002)			
spring tillage, 1 if yes, 0 if no	-0.043^{***} (0.004)			
apply insecticide, 1 if yes, 0 if no	-0.060^{***} (0.004)			
fertilizer N	0.000^{***} (0.000)			
Observations	28521			
R-squared	0.665			

Notes: Table regresses plot-level log of yield on linear and quadratic plant density, weather variables(monthly average of daily minimum and maximum temperature(**tmin** and **tmax**), and monthly PDSI from May to September), the interactions between plant density and weather variables, and the managerial inputs and practices described in Table 1. The model also includes linear time trend and production zone fixed effect model. Units for **tmin** and **tmax** are °C. Unit for plant density is 1000 acre⁻¹. In consideration of the possible heteroskedasticity, Huber-White's robust standard errors are calculated and shown in parentheses. ***Significant at 1% level. **Significant at 5% level.

Table S14: Estimated changes in the effects of plant density on yield as a result of $1^{\circ}C$ warming

	All Months		Jun-A	Aug	
	Estimates	P-value		Estimates	P-value
tmin & tmax	-0.021	0.000	-0.008		0.000
tmin	-0.010	0.000	0.003		0.087
tmax	-0.011	0.000	-0.011		0.000

Notes: (1) The results here are estimated through our main specification in equations (1) and (2) but adding quadratic term of plant density. (2) The first column indicates what weather variables the marginal effects of plant density are based on. The first row indicates a 1°C increase in both **tmin** and **tmax**. The second row refers to a warming scenario where only **tmin** increases by 1°C. The third row refers to a 1°C increase in **tmax**. (3) The second and the third column report coefficients and p-values of the changes in the marginal effects of plant density as a result of warming scenarios (both **tmin** and **tmax**, and **tmin** and **tmax** separately) where temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the changes in the marginal effects of warming scenarios where the temperature of each month from June to August increases by 1°C.

	lnyld
plant density	0.329**
1 v	(0.150)
tmin5	0.168
	(0.240)
m tmin6	-0.153
	(0.306)
tmin7	0.211
	(0.304)
tmin8	-0.446*
	(0.250)
tmin9	0.451^{*}
	(0.219)
tmax5	-0.031
	(0.209)
tmax6	0.071
	(0.248)
tmax7	0.170
t	(0.244)
tinaxo	(0.300)
tmax0	(0.237) 0.135
unax9	(0.130)
tmin5 \times plant density	-0.004
	(0.008)
$tmin6 \times plant density$	0.003
······································	(0.011)
$tmin7 \times plant density$	-0.007
- · ·	(0.011)
tmin8 \times plant density	0.015^{*}
	(0.001)
tmin 9 \times plant density	-0.014^{*}
	(0.001)
tmax5 \times plant density	0.000
	(0.007)
$tmax6 \times plant$ density	-0.001
	(0.010)
$tmax7 \times plant density$	-0.005
	(0.009)
$tmax8 \times plant density$	-0.011
4	(0.009)
$\tan xy \times \text{plant density}$	(0,006)
	(0.000)

Table S15	Regression	results (of the	main	model	specification	SEs	clustered	by year
10010 010.	TOSTODIOI	reparts	or uno	man	model	specification		orubuor ou	by your

Continued							
PDSI5(wet)	-0.077						
	(0.243)						
PDSI6(wet)	-0.148						
	(0.326)						
PDSI7(wet)	0.146						
	(0.211)						
PDSI8(wet)	-0.466						
	(0.336)						
PDSI9(wet)	0.021						
	(0.315)						
PDS15(dry)	-1.479						
	(0.550)						
PDSI6(dry)	1.885**						
	(0.852)						
PDSI7(dry)	0.000						
DDCI8(dmr)	(0.057) 1.262*						
FDSI8(dry)	(0.770)						
PDSI0(dry)	(0.770)						
1 D519(d1y)	(0.639)						
$PDSI5(wet) \times plant density$	0.001						
	(0.001)						
$PDSI6(wet) \times plant density$	0.006						
	(0.011)						
$PDSI7(wet) \times plant density$	-0.005						
, , <u> </u>	(0.008)						
$PDSI8(wet) \times plant density$	0.016^{*}						
	(0.011)						
$PDSI9(wet) \times plant density$	-0.000						
	(0.011)						
$PDSI5(dry) \times plant density$	0.051***						
	(0.019)						
$PDSI6(dry) \times plant density$	-0.065**						
	(0.030)						
$PDSI7(dry) \times plant density$	-0.003						
	(0.024)						
$PDSI8(dry) \times plant density$	0.046						
	(0.027)						
$PDS19(dry) \times plant density$	(0.023)						
	(0.022)						

Continued						
year	0.009^{***} (0.020)					
RW	0.039^{*} (0.005)					
other GM	0.040^{***} (0.001)					
1 if previous crop is corn	$0.080 \\ (0.181)$					
1 if previous crop is wheat	$0.120 \\ (0.191)$					
1 if previous crop is alfalfa or alfalfa/hay	$0.185 \\ (0.174)$					
1 if previous crop is soybean	$0.095 \\ (0.174)$					
1 if previous crop is lupine	-0.175 (0.234)					
fall tillage, 1 if yes, 0 if no	$0.000 \\ (0.024)$					
spring tillage, 1 if yes, 0 if no	-0.037 (0.031)					
apply insectic ide, 1 if yes, 0 if no	-0.062^{**} (0.026)					
fertilizer N	$0.000 \\ (0.000)$					
Observations	28521					
R-squared	0.662					

Notes: SEs are clustered by year. Table regresses plot-level log of yield on plant density, weather variables(monthly average of daily minimum and maximum temperature(tmin and tmax), and monthly PDSI from May to September), the interactions between plant density and weather variables, and the managerial inputs and practices described in Table 1. The model also includes linear time trend and production zone fixed effect model. Units for tmin and tmax are °C. Unit for plant density is 1000 acre⁻¹. In consideration of the possible heteroskedasticity, Huber-White's robust standard errors are calculated and shown in parentheses. ***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.

Table S16: Estimated changes in the effects of plant density on yield as a result of 1°C increase in temperatures SEs clustered by year

	All Mo	onths	Jun-Aug		
	Estimates	P-value	Estimates	P-value	
tmin & tmax	-0.0186	0.021	-0.0055	0.435	
tmin tmax	-0.0066	$0.441 \\ 0.124$	-0.0116	$0.377 \\ 0.168$	

Notes: SEs are clustered by year (1) The results here are estimated through our main specification in equations (1) and (2). (2) The first column indicates what weather variables the marginal effects of plant density are based on. The first row indicates a 1°C increase in both tmin and tmax. The second row refers to a scenario where only tmin increases by 1°C. The third row refers to a 1°C increase in tmax. (3) The second and the third column report coefficients and p-values of the changes in the marginal effects of plant density as a result of higher temperatures (both tmin and tmax increase, and tmin and tmax separately increase) where temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the changes in the marginal effects where the temperature of each month from June to August increases by 1°C.

Table S17: Estimated changes in the effects of plant density on yield as a result of 1°C increase in temperatures (accounting for type of corn hybrid) SEs clustered by year

		All mo	onths	Jun-Aug			
		Estimates	P-value	Estimates	P-value		
tmin & tmax	Conventional	-0.0279	0.002	-0.0069	0.416		
	GM-RW	-0.0127	0.660	0.0123	0.821		
	Other GM	-0.0019	0.859	-0.0002	0.989		
tmin	Conventional	-0.0194	0.128	0.0118	0.368		
	GM-RW	-0.1480	0.000	0.0458	0.512		
	Other GM	-0.0016	0.886	-0.0240	0.344		
tmax	Conventional	-0.0085	0.445	-0.0186	0.175		
	GM-RW	0.1353	0.000	-0.0334	0.376		
	Other GM	-0.0004	0.976	0.0238	0.281		

Notes: SEs are clustered by year (1) The table displays coefficients and p-values of the changes in the marginal effects of plant density as a result of 1° in temperatures. The results are calculated from the estimated results of the model specification in equations (1) and (2) (the specifications including interactions among the weather, plant density and GM varietal dummy variables). (2) The first column indicates what weather variables the marginal effects of plant density are based on. The first row of the first panel indicates a 1°C increase in both tmin and tmax. The first row of the second panel refers to a scenario where only tmin increases by 1°C. The first row of the third panel refers to a situation where only tmax increases by 1°C. (3) The second column indicates the hybrid groups: "RW" is GM hybrids expressing Bt trait for corn rootworm. "other GM" refer to GM hybrids without Bt trait for corn rootworm. (4)The third and fourth column report coefficients and p-values of the changes in marginal effects of plant density as a result of higher temperatures (both tmin and tmax increase, and tmin and tmax separately increase) where the temperature of each month of the May-September growing season increases by 1°C. The last two columns provide coefficients and p-values of the changes in marginal effects where the temperature of each month from June to August increases by 1°C.



Figure S1: Distribution of yield for four production zones

Notes: Each box plot corresponds to the yield of plots in a production zone. The solid line in each distribution is the median. The upper hinge and the lower hinge are the 75^{th} and the 25th percentile values of yield separately. The upper adjacent line represents 75^{th} percentile value + $1.5 \times interquantile \ range$ and the lower adjacent line represents 25^{th} percentile value - $1.5 \times interquantile \ range$.



Figure S2: Distribution of plant density for four production zones

Notes: Each box plot corresponds to the plant density of plots in a production zone. The solid line in each distribution is the median. The upper hinge and the lower hinge are the 75^{th} and the 25th percentile values of plant density separately. The upper adjacent line represents 75^{th} percentile value + $1.5 \times interquantile \ range$ and the lower adjacent line represents 25^{th} percentile value - $1.5 \times interquantile \ range$.



Figure S3: The change in the average corn yields in four production zones over years



Figure S4: The change in the average of plant density in four production zones over years



Figure S5: Regression of the natural log of yield on a quadratic form of plant density



Figure S6: The change in number of plots planting conventional corn over years



Figure S7: The change in number of plots planting GM corn with Bt trait for corn root-worm.



Figure S8: The change in number of plots planting GM corn without Bt trait for corn rootworm



Figure S9: The change in **tmin** and **tmax** across years

Notes: **tmin** and **tmax** are the average of monthly minimum and maximum temperature during the May-September growing season



Figure S10: The change in PDSI across years

Notes: PDSI here are the average of monthly PDSI during the May-September growing season





Notes: The main specification in equations (1) and (2) is implemented. Impacts are reported as the percentage change in yield. The vertical solid lines show 90% confidence interval.



Figure S12: Marginal percentage effect of plant density as tmin and tmax of each month deviate from the mean by 1°C increments

Notes: The figure shows the results of the model with all variables of the main specification except the managerial inputs and practices. Impacts are reported as the percentage change in yield. The vertical solid lines show 90% confidence interval.





Notes: The figure shows the results of the model with all variables of the main specification and the interaction term between time trend and plant density. Impacts are reported as the percentage change in yield. The vertical solid lines show 90% confidence interval.



Figure S14: Marginal percentage effect of plant densities as tmin and tmax of each month deviate from the mean by 1°C increments

Notes: The figure shows the results of the model with the main specification that replaces PDSI as a measure of water availability with a quadratic function of precipitation.



Figure S15: Marginal impacts of plant density for the three varietal groups *Notes:* The figure shows the results of the model specification in equations (1) and (8) replacing PDSI as a measure of water availability with a quadratic function of precipitation. Impacts are reported as the percentage change in yield. The vertical solid lines show 90% confidence interval.



Figure S16: Marginal percentage effect of plant densities as tmin and tmax of each month deviate from the mean by 1°C increments

Notes: The difference between this model and the main specification (the specification in equations (1) and (2)) is that this model controls for year fixed effects rather than linear time trend. The Impacts are reported as the percentage change in yield. The vertical solid lines show 90% confidence interval.





Notes: This model includes a quadratic term of plant density in addition to the explanatory variables adopted in the main specification. The Impacts are reported as the percentage change in yield. The vertical solid lines show 90% confidence interval.



Figure S18: Marginal impacts of plant density for the three varietal groups *Notes:* The model specification is the same as the model specification in equations (1) and (8) except it controls for year fixed effect rather than linear time trend. Impacts are reported as the percentage change in yield. The vertical solid lines show 90% confidence interval.



Figure S19: Marginal impacts of plant density for the three varietal groups *Notes:* The model adds a quadratic term of plant density into the specification in (1) and (8) except it controls for year fixed effect rather than linear time trend. Impacts are reported as the percentage change in yield. The vertical solid lines show 90% confidence interval.