

Supplementary Materials: The following are available online at www.mdpi.com/xxx/s1, Figure S1: title, Table S1: title, Video S1: title.

Figure S1. Soil water storage in the 0–200 cm soil layer throughout the growing season as affected by mulching method in 2017 and 2018.

Figure S2. Maize growth development accumulation days after sowing at different stages as affected by mulching method in 2017 and 2018.

Figure S3. The mean daily temperature accumulated temperature at different stages as affected by mulching method in 2017 and 2018.

Figure S4. Aboveground fresh weight per plant at the days after seeds planting at different stages as affected by mulching method in 2017 and 2018.

Figure S5. Agricultural ecological environment before and after straw strip mulching wheat, potato and maize production at Tongwei, Gansu Province, China in 2017 and 2018.

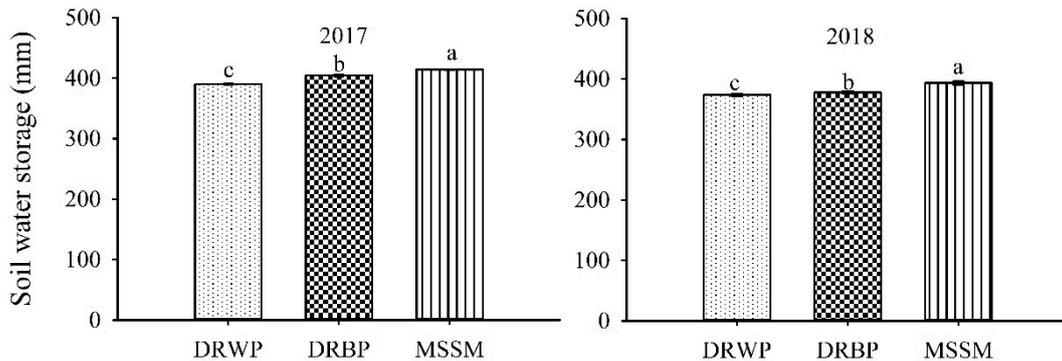


Figure S1. Soil water storage in the 0–200 cm soil layer throughout the growing season as affected by mulching method in 2017 and 2018. Within a year, different letters denote means that are significantly different ($P \leq 0.05$). Error bars indicate standard errors of the means ($n = 3$). DRWP, double ridge-furrow fully mulched soil with white plastic film; DRBP, double ridge-furrow fully mulched soil with black plastic film; MSSM, maize straw strip mulching with alternating strips of mulched and non-mulched soil and maize planted in non-mulched strips.

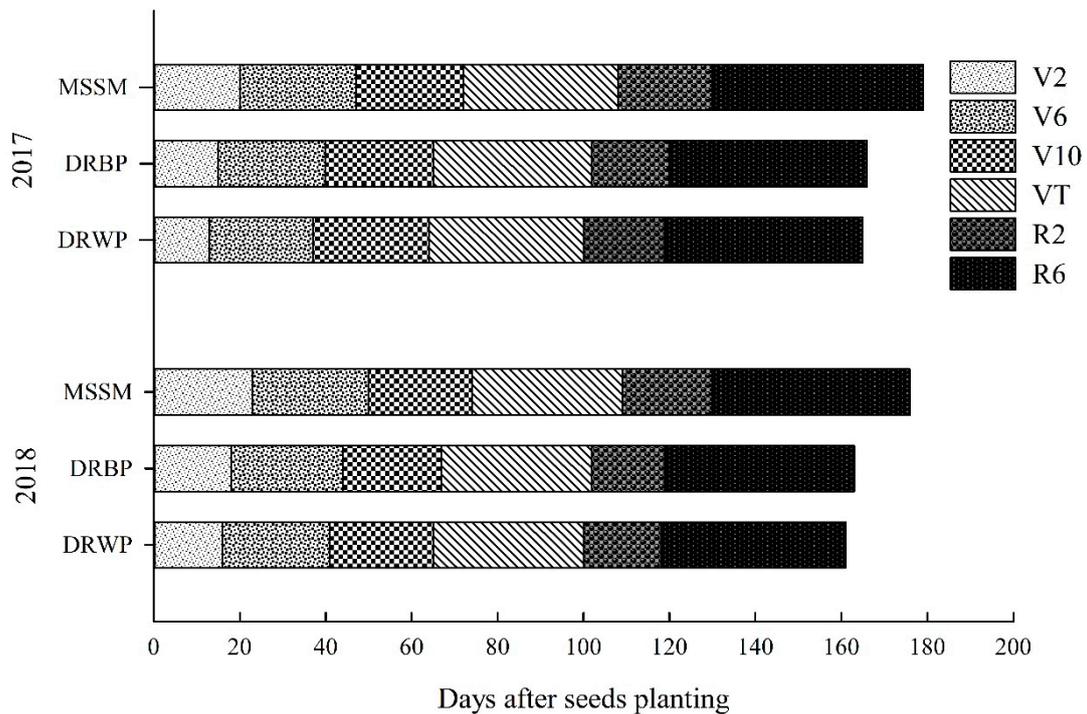


Figure S2. Maize growth development accumulation days after sowing at different stages as affected by mulching method in 2017 and 2018. V2, two leaf collar stage; V6, six leaf collar stage; V10, ten leaf collar stage; VT, tasseling stage; R2, blister stage; R6, physiological maturity. DRWP, Double ridge-furrow fully mulched soil with white plastic film; DRBP, double ridge-furrow fully mulched soil with black plastic film; MSSM, maize straw strip mulching with alternating strips of mulched and non-mulched soil and maize planted in non-mulched strips.

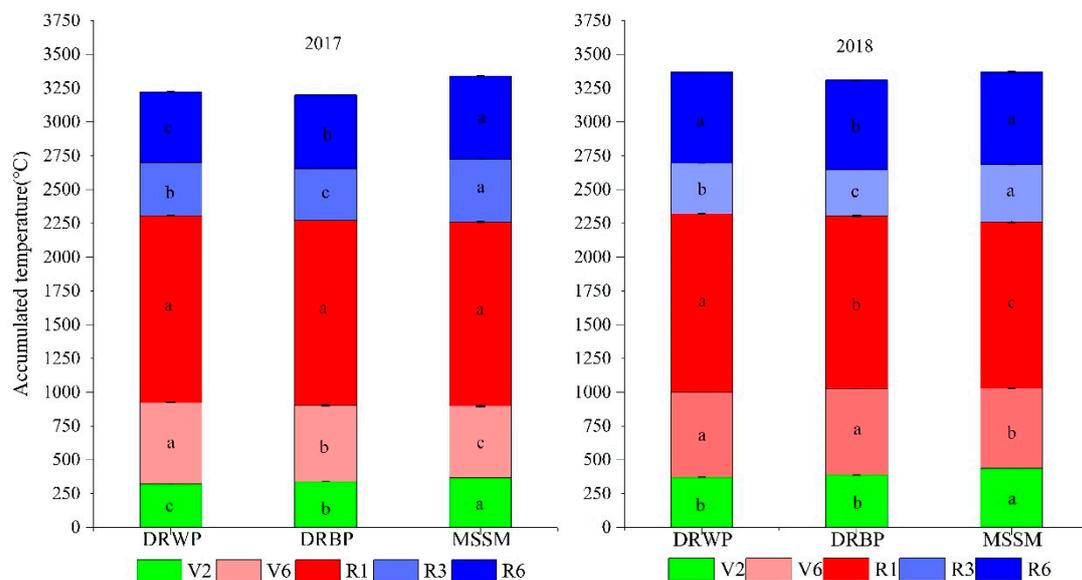


Figure S3. The mean daily temperature accumulated temperature at different stages as affected by mulching method in 2017 and 2018. Within a year, different letters denote means that are significantly different ($P \leq 0.05$). Error bars indicate standard errors of the means ($n = 3$). DRWP, Double ridge-furrow fully mulched soil with white plastic film; DRBP, double ridge-furrow fully mulched soil with black plastic film; MSSM, maize straw strip mulching with alternating strips of mulched and non-mulched soil and maize planted in non-mulched strips.

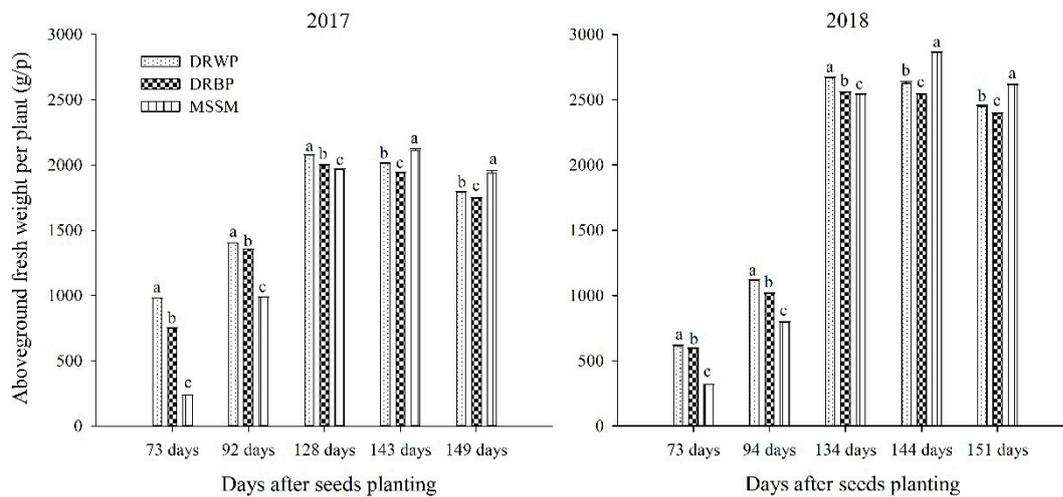


Figure S4. Aboveground fresh weight per plant at the days after seeds planting at different stages as affected by mulching method in 2017 and 2018. Within a year, different letters denote means that are significantly different ($P \leq 0.05$). Error bars indicate standard errors of the means ($n = 3$). DRWP, Double ridge-furrow fully mulched soil with white plastic film; DRBP, double ridge-furrow fully mulched soil with black plastic film; MSSM, maize straw strip mulching with alternating strips of mulched and non-mulched soil and maize planted in non-mulched strips.



Figure S5. Agricultural ecological environment before and after straw strip mulching wheat, potato and maize production at Tongwei, Gansu Province, China in 2017 and 2018. (A1) residual film in surface soil. (A2) evidence of residual film burning in field. (A3) idle maize straw in field. (A4) evidence of maize straw burning in field. (A5) the application of maize straw strip mulching for wheat, maize and potato production. (A6) the soil condition under straw strip mulching. (A7) the soil condition under double ridge mulching with plastic film. (A8) earthworms in surface soil under straw strip mulching. (A9–A10) straw strip mulching winter wheat production. (A11–A12) straw strip mulching potato production. (A14) straw strip mulching spring maize production. (A15) Field after harvest stage under double ridge mulching spring maize production. (A16) Field scene after harvest stage under straw strip mulching spring maize production.