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Does no-till cover crop influence *in situ* measured soil water potential and saturated hydraulic conductivity?

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Electronic Supplementary Material (ESM)

The authors are fully responsible for both the content and the formal aspects of the electronic supplementary material. No editorial adjustments were made.

2 Table S1. Means and ANOVA of *in situ* measured soil water matric potential at the study site during year 1

Treatment	Date										
	12/3/2020	12/10/2020	12/17/2020	12/24/2020	12/31/2020	1/7/2021	1/14/2021	1/28/2021	2/4/2021	2/11/2021	2/18/2021
Soil water potential (kPa)											
CC	1.93 ^a	4.11 ^b	1.89 ^b	3.69 ^b	2.76 ^b	3.25	2.67 ^a	2.78 ^b	2.48 ^b	2.18 ^b	2.00 ^b
NC	2.32 ^b	3.62 ^a	1.62 ^a	2.86 ^a	2.05 ^a	3.13	3.15 ^b	1.86 ^a	1.91 ^a	1.79 ^a	1.87 ^a
Depth (cm)											
0-10	3.84 ^c	5.83 ^c	2.64 ^c	5.91 ^c	4.04 ^c	4.97 ^b	4.62 ^c	3.52 ^c	3.40 ^c	3.18 ^c	2.62 ^c
10-20	1.67 ^b	3.53 ^b	1.64 ^b	2.52 ^b	1.96 ^b	2.37 ^a	2.55 ^b	1.90 ^b	1.81 ^b	1.50 ^b	1.75 ^b
20-30	0.86 ^a	2.24 ^a	0.99 ^a	1.37 ^a	1.22 ^a	2.23 ^a	1.55 ^a	1.57 ^a	1.38 ^a	1.28 ^a	1.43 ^a
ANOVA $P > F$											
Tmt	< 0.001	< 0.001	0.048	0.002	0.032	0.062	0.030	0.003	0.003	0.037	0.048
Depth	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Tmt × depth	< 0.001	0.002	< 0.001	< 0.001	0.004	< 0.001	0.057	0.002	0.044	< 0.001	< 0.001

Table S1 to be continued

Treatment	Date						
	2/25/2021	3/4/2021	3/11/2021	3/18/2021	3/25/2021	4/1/2021	4/8/2021
Soil water matric potential (kPa)							
CC	2.32 ^b	8.14 ^b	15.32 ^b	5.48 ^b	3.86 ^b	8.46 ^b	10.85 ^b
NC	1.90 ^a	7.27 ^a	12.74 ^a	4.02 ^a	2.56 ^a	5.45 ^a	5.75 ^a
Depth (cm)							
0-10	3.95 ^c	14.84 ^c	19.05 ^c	7.88 ^c	5.17 ^c	12.57 ^c	13.35 ^c
10-20	1.52 ^b	5.67 ^b	13.78 ^b	4.15 ^b	2.88 ^b	5.80 ^b	7.00 ^b
20-30	0.86 ^a	2.61 ^a	9.24 ^a	2.23 ^a	1.60 ^a	2.48 ^a	4.53 ^a
ANOVA $P > F$							
Tmt	0.002	0.031	0.004	0.031	0.037	0.040	0.028
Depth	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Tmt × depth	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

CC – cover crop; NC – no cover crop; tmt – treatment; tmt × depth – treatment by depth interaction; mean comparisons were only made for P values of main effects ≤ 0.05 ; means with different alphabets within a column are significantly different at the 0.05 probability level; due to negative soil water potential values, means with higher values are actually lower soil water potentials; date is in the MM/DD/YYYY format

Table S2. Means and ANOVA of *in situ* measured soil water matric potential at the study site during year 2

Treatment	Date							
	10/31/2021	11/7/2021	11/14/2021	11/25/2021	12/2/2021	12/9/2021	12/16/2021	12/23/2021
Soil water potential (kPa)								
CC	13.62 ^a	10.17 ^a	19.54 ^a	14.25 ^a	14.59 ^b	12.11	4.06	2.95 ^a
NC	17.98 ^b	15.18 ^b	21.44 ^b	16.56 ^b	12.37 ^a	11.17	5.20	7.44 ^b
Depth (cm)								
0–10	20.68 ^c	13.81 ^b	11.79 ^a	14.70	12.27 ^a	11.29	3.58	3.98 ^a
10–20	16.63 ^b	12.32 ^a	14.71 ^b	15.63	12.51 ^a	11.48	4.54	5.27 ^b
20–30	10.09 ^a	12.14 ^a	34.98 ^c	15.87	15.66 ^b	12.14	5.78	6.73 ^b
ANOVA $P > F$								
Tmt	< 0.001	0.040	0.045	0.040	0.032	0.163	0.314	0.024
Depth	< 0.001	< 0.001	< 0.001	0.050	< 0.001	0.211	0.351	< 0.001
Tmt × depth	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.111	0.215	< 0.001

Table S2 to be continued

Treatment	Date					
	3/11/2022	3/18/2022	3/25/2022	4/1/2022	4/8/2022	4/15/2022
Soil water matric potential (kPa)						
CC	3.02 ^a	3.27 ^a	10.09 ^a	5.29	5.26 ^a	1.67
NC	5.38 ^b	5.00 ^b	14.22 ^b	6.62	8.91 ^b	2.21
Depth (cm)						
0–10	2.61 ^a	2.91 ^a	7.63 ^a	4.43 ^a	4.63 ^a	1.67
10–20	3.62 ^a	3.74 ^a	11.18 ^b	5.25 ^a	7.69 ^b	1.68
20–30	6.37 ^b	5.74 ^b	17.66 ^c	8.31 ^b	8.94 ^b	2.47
ANOVA $P > F$						
Tmt	0.012	0.021	0.020	0.053	0.023	0.228
Depth	< 0.001	< 0.001	< 0.001	0.014	< 0.001	0.231
Tmt × depth	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.233

CC – cover crop; NC – no cover crop; tmt – treatment; tmt × depth – treatment by depth interaction; mean comparisons were only made for P values of main effects ≤ 0.05 ; means with different alphabets within a column are significantly different at the 0.05 probability level; due to negative soil water potential values, means with higher values are actually lower soil water potentials; date is in the MM/DD/YYYY format

4 Table S3. Means and ANOVA of *in situ* measured soil temperature at the study site during year 1

Treatment	Date										
	12/3/2020	12/10/2020	12/17/2020	12/24/2020	12/31/2020	1/7/2021	1/14/2021	1/28/2021	2/4/2021	2/11/2021	2/18/2021
Soil temperature (°C)											
CC	8.07 ^b	9.21 ^b	7.37 ^b	7.01	9.11 ^b	5.84	4.81	6.73 ^a	6.41 ^a	5.04 ^a	5.04 ^a
NC	8.20 ^a	9.38 ^a	7.54 ^a	7.04	9.36 ^a	5.83	4.85	6.50 ^b	6.28 ^b	4.41 ^b	4.72 ^b
Depth (cm)											
0–10	8.23 ^a	9.42 ^a	7.48	7.13	9.35 ^a	5.58 ^b	4.94 ^a	6.57	6.41 ^a	4.67 ^b	4.95 ^a
10–20	8.15 ^a	9.32 ^a	7.45	7.00	9.25 ^{ab}	5.63 ^b	4.63 ^b	6.62	6.38 ^a	4.54 ^c	4.92 ^a
20–30	8.02 ^b	9.15 ^b	7.43	6.95	9.10 ^b	6.30 ^a	4.94 ^a	6.65	6.25 ^b	4.96 ^a	4.74 ^b
ANOVA $P > F$											
Tmt	0.028	0.047	0.002	0.609	0.003	0.972	0.550	0.041	0.003	< 0.001	0.001
Depth	0.004	0.002	0.689	0.329	0.046	< 0.001	0.013	0.363	0.002	< 0.001	< 0.001
Tmt × depth	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	0.003	< 0.001	< 0.001	0.183	< 0.001

Table S3 to be continued

Treatment	Date						
	2/25/2021	3/4/2021	3/11/2021	3/18/2021	3/25/2021	4/1/2021	4/8/2021
Soil temperature (°C)							
CC	11.28 ^b	9.78 ^b	13.64 ^b	13.12 ^b	14.78 ^b	12.46 ^b	16.49 ^b
NC	11.93 ^a	10.76 ^a	14.46 ^a	13.82 ^a	16.11 ^a	14.82 ^a	17.89 ^a
Depth (cm)							
0–10	11.79 ^a	10.66 ^a	14.27 ^a	13.79 ^a	15.87 ^a	14.35 ^a	17.60 ^a
10–20	11.71 ^a	10.24 ^b	14.20 ^a	13.43 ^b	15.36 ^b	13.44 ^b	17.55 ^a
20–30	11.31 ^b	9.90 ^c	13.68 ^b	13.19 ^c	15.11 ^c	13.13 ^c	16.42 ^b
ANOVA $P > F$							
Tmt	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Depth	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Tmt × depth	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

CC – cover crop; NC – no cover crop; tmt – treatment; tmt × depth – treatment by depth interaction; mean comparisons were only made for P values of main effects ≤ 0.05 ; means with different alphabets within a column are significantly different at the 0.05 probability level; date is in the MM/DD/YYYY format

Table S4. Means and ANOVA of *in situ* measured soil temperature at the study site during year 2

Treatment	Date							
	10/31/2021	11/7/2021	11/14/2021	11/25/2021	12/2/2021	12/9/2021	12/16/2021	12/23/2021
Soil temperature (°C)								
CC	10.16	12.62	10.45	8.29 ^a	12.38 ^a	10.41	12.32 ^a	8.76 ^a
NC	10.02	12.85	10.26	8.01 ^b	11.52 ^b	10.38	11.78 ^b	8.00 ^b
Depth (cm)								
0–10	10.19	12.15 ^b	10.18 ^b	7.62 ^c	10.54 ^c	10.10 ^b	11.62 ^b	7.74 ^c
10–20	10.15	12.27 ^b	10.24 ^b	8.09 ^b	12.46 ^b	10.13 ^b	12.23 ^a	8.50 ^b
20–30	9.95	13.78 ^a	10.64 ^a	8.74 ^a	12.85 ^a	10.94 ^a	12.29 ^a	8.88 ^a
ANOVA $P > F$								
Tmt	0.267	0.167	0.208	0.049	< 0.001	0.791	< 0.001	< 0.001
Depth	0.262	< 0.001	0.028	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Tmt × depth	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table S4 to be continued

Treatment	Date					
	3/11/2022	3/18/2022	3/25/2022	4/1/2022	4/8/2022	4/15/2022
Soil temperature (°C)						
CC	12.18 ^a	14.22 ^a	13.55	14.10 ^b	14.61 ^b	17.67 ^b
NC	11.35 ^b	13.53 ^b	13.36	14.87 ^a	14.94 ^a	17.99 ^a
Depth (cm)						
0–10	11.81	13.89	13.60 ^a	14.96 ^a	14.99 ^a	17.33 ^c
10–20	11.80	13.91	13.56 ^a	14.61 ^b	14.98 ^a	17.79 ^b
20–30	11.63	13.82	13.21 ^b	13.62 ^c	14.35 ^b	18.38 ^a
ANOVA $P > F$						
Tmt	< 0.001	< 0.001	0.051	< 0.001	< 0.001	0.004
Depth	0.093	0.244	< 0.001	< 0.001	< 0.001	< 0.001
Tmt × depth	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

CC – cover crop; NC – no cover crop; tmt – treatment; tmt × depth – treatment by depth interaction; mean comparisons were only made for P values of main effects ≤ 0.05 ; means with different alphabets within a column are significantly different at the 0.05 probability level; date is in the MM/DD/YYYY format