

Table S1. List of bacterial species identified using MALDI-TOF MS in the podzolic soils with a depth of 0 - 25 cm in April and August 2021 for the cultivation of spring barley. Control (without fertilization), NPK K₂O in mineral fertilizers, P1–100 kg K₂O ha⁻¹ in ash (0.5 t ha⁻¹ of ash in bulk weight), P2–200 kg K₂O ha⁻¹ in ash (1.0 t ha⁻¹ of ash in bulk weight), P3–300 kg K₂O ha⁻¹ in ash (1.5 t ha⁻¹ of ash in bulk weight), P4–400 kg K₂O ha⁻¹ in ash (2.0 t ha⁻¹ of ash in bulk weight), P5–500 kg K₂O ha⁻¹ in ash (2.5 t ha⁻¹ of ash in bulk weight).

Taxa	Podzolic soil																																									
	April																		August																							
	Control			NPK			P1			P2			P3			P4			P5			Control			NPK			P1			P2			P3			P4			P5		
	0-5	10-15	20-25	0-5	10-15	20-25	0-5	10-15	20-25	0-5	10-15	20-25	0-5	10-15	20-25	0-5	10-15	20-25	0-5	10-15	20-25	0-5	10-15	20-25	0-5	10-15	20-25	0-5	10-15	20-25	0-5	10-15	20-25	0-5	10-15	20-25						
<i>Arthrobacter globiformis</i>														+																+			+									
<i>Bacillus amyloliquefaciens</i> ssp. <i>amyloliquefaciens</i>														+																+			+									
<i>Bacillus amyloliquefaciens</i> ssp. <i>plantarum</i>														+																+			+									
<i>Bacillus cereus</i>				+	+	+		+	+	+	+	+	+	+		+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+					
<i>Bacillus megaterium</i>	+	+	+	+	+	+	+	+	+	+	+			+	+	+	+	+	+		+	+	+		+	+	+	+	+	+	+	+	+	+	+	+						
<i>Bacillus mycoides</i>								+					+		+						+	+			+	+	+		+	+	+		+									
<i>Bacillus pseudomycoides</i>																+				+				+				+					+									
<i>Bacillus thuringiensis</i>												+	+			+		+	+							+		+	+		+	+			+	+						
<i>Bacillus weihenstephanensis</i>												+	+								+	+					+	+		+	+		+	+								
<i>Lysinibacillus fusiformis</i>									+	+	+															+	+	+	+													
<i>Paenibacillus amylolyticus</i>												+														+		+		+	+											
<i>Pseudarthrobacter oxydans</i>														+	+																+			+								

<i>Pseudomonas brassicacearum</i>																			+	+																			+	+		
<i>Pseudomonas chlororaphis</i>																		+		+	+							+	+											+	+	
<i>Pseudomonas chlororaphis</i> ssp. <i>aurantiaca</i>																				+	+																				+	+
<i>Pseudomonas chlororaphis</i> ssp. <i>chlororaphis</i>																					+																					+
<i>Pseudomonas corrugata</i>																					+																					+
<i>Pseudomonas frederiksbergensis</i>				+												+					+	+									+			+							+	
<i>Pseudomonas fuscovaginae</i>																					+																					+
<i>Pseudomonas jessenii</i>																				+																			+			
<i>Pseudomonas kilonensis</i>																					+																					+
<i>Pseudomonas mandelii</i>																				+																			+	+		
<i>Pseudomonas migulae</i>																				+																			+	+		
<i>Pseudomonas rhodesiae</i>																					+																					+
<i>Pseudomonas thivervalensis</i>																				+	+																		+	+		
<i>Pseudomonas vancouverensis</i>																					+																					+
<i>Staphylococcus aureus</i>																					+																					+
<i>Staphylococcus aureus</i> ssp. <i>aureus</i>																					+																					+
Total	1	1	1	3	2	2	1	2	4	3	3	2	4	6	4	3	4	4	2	10	15	1	1	1	6	5	1	2	5	3	4	6	3	5	7	5	4	7	6	2	10	17

Table S2. List of bacterial species identified using MALDI-TOF MS in the chernozem soil with a depth of 0 - 25 cm in April and August 2021 for the cultivation of spring barley. Control (without fertilization), NPK K₂O in mineral fertilizers, C1–100 kg K₂O ha⁻¹ in ash (0.5 t ha⁻¹ of ash in bulk weight), C2–200 kg K₂O ha⁻¹ in ash (1.0 t ha⁻¹ of ash in bulk weight), C3–300 kg K₂O ha⁻¹ in ash (1.5 t ha⁻¹ of ash in bulk weight), C4–400 kg K₂O ha⁻¹ in ash (2.0 t ha⁻¹ of ash in bulk weight), C5–500 kg K₂O ha⁻¹ in ash (2.5 t ha⁻¹ of ash in bulk weight).

[illegible]

<i>Pseudomonas caricapapayae</i>																	+																			+	+					
<i>Pseudomonas chlororaphis</i>							+				+														+			+			+											
<i>Pseudomonas chlororaphis</i> ssp. <i>aurantiaca</i>									+								+											+								+						
<i>Pseudomonas chlororaphis</i> ssp. <i>chlororaphis</i>									+								+											+								+						
<i>Pseudomonas corrugata</i>							+										+				+							+			+				+				+	+		
<i>Pseudomonas extremorientalis</i>	+																				+																					
<i>Pseudomonas frederiksbergensis</i>									+					+	+	+	+											+					+	+	+	+	+		+			
<i>Pseudomonas fuscovaginae</i>																																										
<i>Pseudomonas gessardii</i>															+																					+						
<i>Pseudomonas graminis</i>																	+																			+						
<i>Pseudomonas jessenii</i>									+						+			+										+							+			+				
<i>Pseudomonas kilonensis</i>									+								+	+										+							+	+	+	+				
<i>Pseudomonas koreensis</i>							+				+						+										+			+			+	+		+	+					
<i>Pseudomonas libanensis</i>	+																				+	+																		+	+	
<i>Pseudomonas mandelii</i>									+																		+									+						
<i>Pseudomonas migulae</i>																					+																			+	+	
<i>Pseudomonas orientalis</i>																	+																				+		+			
<i>Pseudomonas protegens</i>																					+																			+	+	
<i>Pseudomonas proteolytica</i>							+								+											+									+							
<i>Pseudomonas rhodesiae</i>																					+																			+	+	
<i>Pseudomonas thivervalensis</i>									+						+		+		+	+							+						+			+		+	+			
<i>Pseudomonas trivialis</i>																											+															
<i>Pseudomonas vancouverensis</i>									+						+		+									+								+								
<i>Rhodococcus erythropolis</i>																+																				+						
Total	2	1	1	1	1	1	6	1	11	4	4	5	2	3	12	10	14	13	5	4	11	3	1	1	2	1	1	7	2	13	5	6	6	4	5	15	12	17	15	7	13	13