

Table S1. Correlation and regression between seedbed depth and other seedbed parameters

Crop	Seedbed depth (x) variation	Depended variable, Y	Correlation coefficient, r	Simplified regression	Tillage/sowing practices	Soil texture and group	References
Winter wheat	38.5–40.5 mm	Roughness of seedbed top, mm	-0.982	Y=103.917-1.5x	Tillage: disc harrowing, pre-sowing cultivation with compound cultivator, rolling. Sowing: mechanical drill with disc-form sowing shares.	Average loam Cambisol	[39]
		L1 moisture content, %	-1.000*	Y=56.642-1.05x			
		L2 moisture content, %	-0.866	Y=20.417-0.1x			
		L1 soil particles 2-5 mm, %	-0.999*	Y=63.717-1.1x			
		L1 soil particles > 5 mm, %	-0.995*	Y=171.567-3.0x			
		L1 sowing evenness, %	0.985	Y=-22.4+1.0x			
Spring wheat	39–43 mm	L3 soil particles > 5 mm, %	0.922	Y=-13.714+1.429x	Tillage: disc harrowing, pre-sowing cultivation with compound cultivator. Sowing: mechanical drill with disc-form sowing shares.	Average loam Cambisol	[38]
		Roughness of seedbed down, mm	0.983*	Y=-17.771+0.743x			
		L3 moisture content, %	0.930*	Y=-8.730+0.685x			
		L2 soil particles < 2 mm, %	0.717	Y=-7,943+0.670x			
		L3 sowing evenness, %	0.743	Y=13.086+1.029			
Spring barley	40.4–45.6 mm	L2 moisture content, %	0.985*	Y=10.565+0.176x	Tillage: ploughing or stubble cultivating with hoe shares, pre-sowing cultivation with compound cultivator. Sowing: mechanical drill with disc-form or implemented with rotary tilling sowing shares.	Average loam Luvisol	[40]
		L3 moisture content, %	0.911	Y=7.767+0.329x			
		L1 soil particles < 2 mm, %	-0.937	Y=63.869-1.061x			
		L2 soil particles < 2 mm, %	-0.893	Y=54.918-0.741x			
		L2 soil particles > 5 mm, %	0.833	Y=6.677+0.784x			
		L3 soil particles 2-5 mm, %	-0.968*	Y=66.648-0.652x			
		L3 soil particles > 5 mm, %	0.899	Y=-7.712+1.156x			
	15.6–57.4 mm	Roughness of seedbed top, mm	0.922	Y=-23.02+1.622x	Tillage: direct drilling, Shallow ploughing (10 cm depth), deep ploughing (20 cm depth).	Average loam Luvisol	[43]
		L1 sowing evenness, %	-0.999*	Y=79.155-1.355x			
		L3 sowing evenness, %	0.914	Y=-23.02+1.672x			
Sugar beet	14–53 mm	L1 soil particles < 2 mm, %	0.857	Y=-0.531+0.635x	Intensive tillage: ploughing, pre-sowing cultivation with S-tine cultivator or compound cultivator or rotary tiller.	Silty loam Planosol	[3]
		L2 soil particles < 2 mm, %	0.844	Y=7.769+0.538x;			
		L3 soil particles < 2 mm, %	0.813**	Y=5.99+0.549x			
		L1 moisture content, %	-0.871**	Y=26.527-0.427x	Reduced tillage: spring stubble cultivation with rotovator or rotary tiller. Sowing: conventional pneumatic machine with cuneiform shares.		
		L2 moisture content, %	-0.764*	Y=25.776-0.227x			
		L3 moisture content, %	-0.720	Y=24.933-0.175x			

	12.8–45.7 mm	Roughness of seedbed top, mm	0.605	$Y=31.741+0.285x$	Intensive tillage: ploughing, pre-sowing cultivation, rolling. Reduced tillage: spring stubble cultivation with rotovator or rotary tiller, zero tillage. Sowing: conventional pneumatic sowing with cuneiform shares or direct mechanical sowing with combined disc-shoe shares.	Silty loam Planosol	[26,44,45]
		Roughness of seedbed down, mm	0.450	$Y=5.867+0.106x$			
		L1 moisture content, %	-0.871**	$Y=26.527-0.427x$			
		L2 moisture content, %	-0.764*	$Y=25.776-0.227x$			
		L1 soil particles < 2 mm, %	0.539	$Y=-6.869+0.767x$			
		L1 soil particles > 5 mm, %	-0.439	$Y=79.675-0.773x$			
		L2 soil particles < 2 mm, %	0.703	$Y=-4.842+0.845x$			
		L2 soil particles 2-5 mm, %	0.618	$Y=26.277+0.191x$			
		L2 soil particles > 5 mm, %	-0.737*	$Y=78.455-1.037x$			
		L3 soil particles < 2 mm, %	0.601	$Y=-4.948+0.756x$			
		L3 soil particles > 5 mm, %	-0.680	$Y=80.172-0.991x$			
		L1sowing evenness, %	-0.826*	$Y=81.11-2.098x$			
		L3 sowing evenness, %	0.636	$Y=-22.714+2.095x$			
	22–55 mm	Roughness of seedbed top, mm	0.524*	$Y=19.533+0.535x$	Tillage: ploughing, pre-sowing cultivation with compound cultivator, rolling with spur and Cambridge rollers.	Silty loam Planosol	[46,47]
Maize	47–77 mm	Roughness of seedbed top, mm	0.342	$Y=41.614+0.163x$	Intensive tillage: ploughing, pre-sowing cultivation with compound cultivator. Reduced tillage: autumn stubble cultivation with disc cultivator. Sowing: conventional pneumatic machine with cuneiform or disc shares.	Silty loam Planosol and Luvisol	[48]
		Roughness of seedbed down, mm	0.331	$Y=3.33+0.114x$			
		L2 moisture content, %	-0.915	$Y=32.642-0.197x$			
		L3 moisture content, %	-0.990**	$Y=32.582-0.182x$			
		L1 soil particles < 2 mm, %	0.796	$Y=-5.405+0.672x$			
		L1 soil particles 2-5 mm, %	-0.442	$Y=28.62-0.042x$			
		L1 soil particles > 5 mm, %	-0.744	$Y=76.785-0.629x$			
		L2 soil particles < 2 mm, %	0.711	$Y=1.429+0.471x$			
		L2 soil particles > 5 mm, %	-0.590	$Y=71.166-0.499x$			
		L3 soil particles > 5 mm, %	-0.490	$Y=76.809-0.487x$			
		L1sowing evenness, %	-0.728	$Y=10.147-0.147x$			
		L2 sowing evenness, %	-0.737	$Y=201.454-2.565x$			
		L3 sowing evenness, %	0.758	$Y=-111.601+2.712x$			
Winter oilseed rape	24–37 mm	L2 moisture content, %	-0.499	$Y=30.656-0.588x$	Tillage: ploughing or disc harrowing, pre-sowing cultivation with compound cultivator. Sowing:	Silty loam Luvisol,	[38,39,49]
		L3 moisture content L3, %	-0.535	$Y=30.997-0.547x$			
		L1 soil particles > 5 mm, %	0.870	$Y=-17.791+1.716x$			

		L2 soil particles 2-5 mm, %	0.441	Y=24.053+0.166x	mechanical drill with disc-form sowing shares.	average loam Cambisol	
		L3 soil particles < 2 mm, %	-0.617	Y=64.999-0.81x			
		L3 soil particles 2-5 mm, %	-0.638	Y=43.755-0.376x			
		L3 soil particles > 5 mm, %	-0.680	Y=65.782-1.036x			
		L1sowing evenness, %	0.624	Y=10.527+0.583x			
		L2 sowing evenness, %	-0.586	Y=94.804-1.341x			
Spring oilseed rape	28–38 mm	Roughness of seedbed top, mm	-0.950	Y=49.697-0.36x	Tillage: ploughing or stubble cultivating with hoe shares, pre-sowing cultivation with compound cultivator. Sowing: mechanical drill with disc-form sowing shares.	Average loam Luvisol	[40]
		L2 moisture content, %	-0.970*	Y=31.148-0.0366x			
		L3 moisture content, %	-0.997**	Y=41.188-0.567x			
		L1 soil particles 2-5 mm, %	0.998**	Y=9.637+0.789x			
		L1 soil particles > 5 mm, %	-0.989**	Y=80.276-0.756x			
		L2 soil particles < 2 mm, %	0.992**	Y=1.49+0.199x			
		L2 soil particles 2-5 mm, %	0.991**	Y=27.915+0.427x			
		L2 soil particles > 5 mm, %	-0.994**	Y=70.821-0.632x			
		L3 soil particles < 2 mm, %	1.000**	Y=2.888+0.111x			
		L3 soil particles 2-5 mm, %	0.990**	Y=23.971+0.369x			
		L3 soil particles > 5 mm, %	-0.934	Y=68.617-0.385x			
		L1sowing evenness, %	0.997**	Y=-9.894+0.348			
		L2 sowing evenness, %	-0.977*	Y=46.725-0.4x			
		L3 sowing evenness, %	0.984*	Y=60.907+0.113x			

Table S2. Correlation and regression between seedbed depth and crop germination, development and productivity

Crop	Seedbed depth (x) variation	Depended variable, Y	Correlation coefficient, r	Simplified regression equation	Tillage/sowing practices	Soil texture and group	Reference
Winter wheat	38.5–40.5 mm	Productive stems m ⁻²	1.000*	Y=648.717+2.5x	Tillage: disc harrowing, pre-sowing cultivation with compound cultivator, rolling. Sowing: mechanical drill with disc-form sowing shares.	Average loam Cambisol	[39]
		Mass of 1000 kernels, g	-0.993	Y=70.217-0.5x			
		Yield of grain, t ha ⁻¹	0.883	Y=-9.097+0.5x			
Spring wheat	39–43 mm	Seed germination, plants m ⁻²	0.675	Y=-26.286+14.571x	Tillage: disc harrowing, pre-sowing cultivation with compound cultivator. Sowing: mechanical drill with disc-form sowing shares.	Average loam Cambisol	[38]
		Productive stems m ⁻²	0.653	Y=398.629+7.543x			
		Mass of 1000 kernels, g	0.717	Y=26.029+0.343x			
		Yield of grain, t ha ⁻¹	0.778	Y=3.806+0.069x			
		Seed germination, plants m ⁻²	0.582	Y=333.193+11.863x			[40]

Spring barley	40.4–45.6 mm	Height of plant, cm	$r=-0.851$	$Y=107.986-0.718x$	Tillage: ploughing or stubble cultivating with hoe shares, pre-sowing cultivation with compound cultivator. Sowing: mechanical drills with disc-form or implemented with rotary tilling sowing shares.	Average loam Luvisol	
		Mass of 1000 grains, g	$r=-0.946$	$Y=62.894-0.443x$			
Sugar beet	0–6 cm	Seed germination, %	$r=-0.649^{**}$	$Y=109.053-8.097x$	Pot experiment.	Silty loam Planosol	[69]
		Mass of seedling, g	$r=-0.961^{**}$	$Y=0.394-0.041x$			
		Height of seedling, cm	$r=-0.957^{**}$	$Y=10.475-0.882x$			
	14–53 mm	Seed germination, %	$r=-0.601^*$	$Y=102.03-43.70x$	Intensive tillage: ploughing, pre-sowing cultivation with S-tine cultivator or compound cultivator or rotary tiller. Reduced tillage: spring stubble cultivation with rotovator or rotary tiller. Sowing: conventional pneumatic sowing machine with cuneiform shares.	Silty loam Planosol	[3]
	22–55 mm	Seed germination, %	$r=-0.563$	$Y=77.4-0.778x$	Tillage: ploughing, pre-sowing cultivation with compound cultivator, rolling with spur and Cambridge rollers.	Silty loam Planosol	[46,47]
	2.7–9.3 cm	Technical length of root-crop, cm	$r=0.556$	$Y=15.464+0.684x$	Tillage: ploughing, pre-sowing cultivation with S-tine cultivator, compound cultivator or rotary tiller. Sowing: conventional pneumatic machine sowing with cuneiform shares.	Silty loam Planosol	[70,71]
		Diameter of root-crop, cm	$r=0.622$	$Y=9.058+0.263x$			
Maize	47–77 mm	Seed germination, plants m^{-2}	-0.797	$Y=22.725-0.192x$	Intensive tillage: ploughing, pre-sowing cultivation with compound cultivator. Reduced tillage: autumn stubble cultivation with disc cultivator. Sowing: conventional pneumatic machine with cuneiform or disc shares.	Silty loam Planosol and Luvisol	[48]
		Final crop density, plants m^{-2}	-0.764	$Y=19.645-0.157x$			
		Mass of 1000 kernels, g	0.856	$Y=-45.254+5.387x$			
		Yield of grain, t ha^{-1}	0.919	$Y=1.628+0.057x$			
	24–37 mm	Number of siliques, m^2	-0.323	$Y=17078.197-125.136x$	Mouldboard ploughing or disc harrowing, pre-sowing cultivation,	Silty loam Luvisol,	[38,39,49]

Winter oilseed rape		Yield of seeds, t ha ⁻¹	-0.991**	Y=14.145-0.307x	sowing by mechanical drill with disc-form shares.	average loam Cambisol	
Fibre flax	0-60.0 mm	Height, cm	-0.726	Y=89.892-0.851x	Mouldboard ploughing followed by spring disking and harrowing prior to seeding. Data of not rolled treatment.	Loam of Melanic Brunisol	[73]
		Fresh yield, t ha ⁻¹	-0.833	Y=30.608-0.949x			
		Dry matter content, %	0.923*	Y=33.301+0.961x			