

Determining Acceptable Field Soil Conditions

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What Soil Conditions?

- 1. Soil temperature
 - Planting
 - Nutrient availability
- 2. Soil moisture
 - Tillage
 - Planting
 - Compaction
 - Manure application



Optimum Soil Temperature for Germination

• Most seed germinate when soil temperature is between 68F and 86F.

Сгор	Minimum	Optimum range	
	0	F	
Corn	50	65 – 95	
Soybean	50	68 – 98	
Alfalfa	37	65 – 77	
Tomatoes	50	65 – 85	

• Stand evenness is affected by soil temperature.













	2016	2017	2018	3YR – Average
Tillage	bu/acre			
	Arlington			
Chisel/disk	221 ns	167 ns	169 ns	186
No-tillage	229	163	159	184
No-tillage – NS	231	163	169	188
Strip tillage	252	155	159	189
	Lancaster			
Chisel/disk	198 ns	132 ns	190 ns	173
No-tillage	167	148	180	165
No-tillage – NS	182	174	183	180
Strip tillage	212	137	188	179







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Optimum Soil Moisture for Tillage & Planting

- Tillage main concern with tillage and soil moisture is to avoid creating smearing, excessive aggregate breakup, and creation of tillage pans.
- Planting main concern with planting and soil moisture is to have good seed-to-soil contact, avoid sidewall compaction, and that the seed has adequate moisture.
- Optimum parameters with vary with soil type and management (tillage type, cover crop, residue present)

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Weight Bearing Capacity of Soil is Affected by Tillage: Better Soil Aggregation is Key





Closing Comments

- Soil temperature and moisture conditions affects agronomic and other soil factors.
- Maps provide current or predictive conditions, which can be useful to stay up-to-date with changing conditions. However, each farm and field is different, and require in-field assessments.
- Instruments are available to help make these assessments, but qualitative assessments are also useful (maybe not so much for soil temperature).

