

Impact of Field Rolling on Soybean Performance

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A trial was conducted to determine the effect of timing of field rolling on soybean injury, stand, and yield. The dryland trial was conducted on Heimdal loam soil with 2.9% organic matter. Experimental design was a randomized complete block with four replications. ND96-8929E (RR) soybean was solid-seeded (7-inch rows) on June 4. A 3000 lb., 15-ft. wide, 18-inch diameter,

3-point hitch mounted Bison roller was used for field rolling at 4-5 mph during afternoons (1:30-3:30 p.m.) on a dry soil surface preemergence; during early emergence, cotyledon, first trifoliolate, and third- to fourth-trifoliolate (10- to 14-inch tall) soybean growth stages (Table). In addition, rolling at the third- to fourth-trifoliolate (10- to 14-inch tall) soybean growth stage was performed early morning (7 a.m. with foggy weather and wet foliage). The trial was harvested with a plot combine on October 15. Soybean stand, lodging, and seed yield of rolling treatments were similar to the untreated check. Plant injury generally increased as post-emergence rolling was delayed. Injury evaluated four weeks after rolling on 3- to 4-trifoliolate soybean greatly increased when rolled during early morning compared to afternoon. The depth of the compacted soil layer generally decreased as rolling was delayed.

Table. Soybean impact with timing of field rolling, Carrington, 2004.

Field roll timing		Soybean stand		Plant injury*		Plant	Seed	Compacted
Plant stage	Date	1-2 WAT**	5-Oct	1-2 WAT	4 WAT	Lodge	Yield	Soil Layer***
		plants/ft ²		%		0-9	bu/A	inch
untreated	x	5	4	0	0	1	23.4	15
PRE	8-Jun	5	4	1	8	2	19.2	9
≤ 30% cotyledons emerged	12-Jun	5	5	4	6	2	21.4	14
cotyledon	18-Jun	5	5	8	6	1	16.1	10
1st trifoliolate	1-Jul	5	4	13	13	1	23.4	4
3-4 trifoliolate	16-Jul	5	5	20	15	1	24.7	4
3-4 trif - am	17-Jul	5	3	28	34	2	18.7	4
MEAN		5	4	11	12	1	21.0	8
C.V. %		11	15	73	60	37	27	50
LSD 0.05		NS	NS	11	10	NS	NS	6
*Injury included bent, broken, or calloused stems.								
**Weeks after treatment.								
***Penetrometer used to determine compacted layer measured from soil surface. Measured same day as rolling.								