

Sangre injury from simulated glyphosate drift. Harlene Hatterman-Valenti and Collin Auwarter.

This study was conducted at the Northern Plains Potato Grower's Non-Irrigation Research site near Grand Forks, ND to evaluate glyphosate drift at different growth stages on Sangre Potato. Soybeans were grown in 2009. Plots were 4 rows by 20 ft arranged in a randomized complete block design with four replicates. Seed pieces (2 oz) were planted on 36 inch rows and 12 inch spacing on June 24, 2010. Treatments were applied on August 6 (tuber initiation-TI), August 25 (early tuber bulking-EB), and September 14 (late tuber bulking-LB) to the middle 2 rows with a modified ATV sprayer. Roundup Weathermax (5.5 lb/gal ai glyphosate) and AMS @ 4 pounds/100 gallons were used in this trial. Potatoes were machine harvested October 20 and graded a few weeks later. Application, environmental, and crop data are listed below:

Date:		8/6/10	8/25/10	9/14/10
Treatment:		TI	ETB	LTB
Sprayer:	GPA:	5	5	5
	PSI:	40	40	40
	Nozzle:	80005	80005	80005
Air temperature (F):		65	66	61
Relative humidity (%):		80	50	50
Wind (MPH):		3	7	5
Soil moisture:		Adequate	Adequate	Adequate
Cloud cover (%):		10	0	75
Next rain:		8/10/10	8/30/10	9/16/10

Glyphosate at the rate of 0.25 lb ai/a at either the tuber initiation (TI), early tuber bulking (EB), and late tuber bulking (LB) stage had the greatest affect on yield. The lowest yield was when glyphosate @ 0.25 lb ai/a was applied at the EB stage with 47 cwt/a, followed by glyphosate @ 0.25 lb ai/a applied at the LB stage with 76 cwt/a. The highest yield was when glyphosate @ 0.0625 lb ai/a was applied at TI with 216 cwt/a. The untreated plants had the second highest yield with 194 cwt/a, and was followed by plants treated with 0.0625 lb ai/a glyphosate at EB, and LB, respectively. Tuber counts in 20 feet of row showed that plants treated with 0.0625 lb ai/a glyphosate at the EB stage produced the most tubers, with 135, followed by plants treated with 0.25 lb ai/a glyphosate at the TI stage with 118 tubers. The untreated plants were in the middle of total tuber counts, but had 49% of the tubers > 4 oz. The highest percentage of "A-size" tubers was from plants treated with 0.0625 lb ai/a glyphosate at the TI stage with 51%. Plants within all glyphosate treatments of 0.625 lb ai/a, regardless of the growth stage timing, produced more "A-size" tubers compared to plants receiving higher glyphosate rates.

Table 1. Effect of glyphosate drift on yield and grade on Sangre potatoes.

			App	Total	<4 oz	4-6 oz	6-10 oz	>10 oz	>4 oz	Total	<4 oz	4-6 oz	6-10 oz	>10 oz	>4 oz
Name	Rate	Unit	Code	-----cwt/a-----					-----Tuber counts in 20 feet-----					Tuber %	
Unt				194 ab	37 a	59 a	31 a	67 a	157 ab	85 ab	43 b	21 ab	9 a	12 a	49 ab
RU*	.25	lb ai/a	A	150 abc	71 a	51 ab	19 ab	8 b	78 a-d	118 ab	91 ab	20 ab	6 ab	2 b	23 bcd
RU*	.125	lb ai/a	A	138 abc	50 a	54 ab	21 ab	12 b	88 a-d	83 ab	54 ab	22 ab	6 ab	2 b	43 abc
RU*	.0625	lb ai/a	A	216 a	47 a	73 a	28 ab	68 a	169 a	95 ab	47 ab	27 a	8 ab	12 a	51 a
RU*	.25	lb ai/a	B	47 c	35 a	6 b	3 b	3 b	12 d	67 b	63 ab	3 b	1 b	1 b	6 d
RU*	.125	lb ai/a	B	118 abc	56 a	29 ab	12 ab	20 b	62 bcd	95 ab	77 ab	11 ab	3 ab	4 b	20 cd
RU*	.0625	lb ai/a	B	188 ab	78 a	63 a	23 ab	25 b	110 abc	135 a	99 a	25 a	7 ab	4 b	27 a-d
RU*	.25	lb ai/a	C	76 bc	38 a	25 ab	3 b	10 b	38 cd	59 b	45 ab	11 ab	1 b	2 b	24 bcd
RU*	.125	lb ai/a	C	118 abc	45 a	43 ab	19 ab	12 b	74 bcd	76 ab	52 ab	16 ab	5 ab	2 b	30 a-d
RU*	.0625	lb ai/a	C	182 ab	45 a	54 ab	24 ab	58 a	137 ab	88 ab	51 ab	20 ab	7 ab	10 a	42 abc
*AMS added	LSD (P<.05)			74	27	33	17	20	61	39	33	13	4	4	17