

Forage Facts



Drill Variability

Introduction

It is always good to calibrate drills prior to planting seeds, especially the small seeded forage crops. There are several ways to do the calibration and they all involve catching the seeds from several “spouts” while pulling or turning the wheel of the drill for a specified distance. Because it is inconvenient to disconnect the drop tubes on each seed spout many people choose two to six of the spouts to collect the seeds and then just calculate the rate per acre based on the number of drill rows for the drill. This method is satisfactory if all drill spouts deliver the same amount of seeds per acre, but this is not the case on most drills.

The purpose of this fact sheet is to share the data from several training sessions where four different drills were calibrated for various species. The aim of this paper is show that seeding rates can vary significantly from spout to spout and that it is wise to catch seeds from all spouts if you want to know more precisely what the rate per acre is for the whole drill.

Tables 1-3 show the wide variation in seeding rates among the drill spouts within each drill. Depending on the drill and the type of seeds you will note variations from 10% up to 400%.

Table 1 shows that fescue in the small hopper was being sown at 7 lbs/acre through dropper 2 and 11 lbs from dropper 13 (57% difference). Consider the impact on actual number of seeds planted per acre if one chose only 2 or three drill spouts to get an estimate of the “average” planting rate. When planting at very low seeding rates it may be that some rows would have such a low output that one could have a “skip” in the field. To improve the odds of knowing the exact seeding rate for a drill it is necessary to collect seeds from each drill spout.

The high seed cost of many native species dictates that close attention be paid to calibration of drills.

Table 4 provides estimates of seeding rates when one can determine the number of seeds that have been planted per square foot.

Table 1. Seed (wheat and tall fescue) output from every seed spout from a Haybuster drill.

seed type	Drill spout # from left of machine when standing behind the drill													Average Seeding Rate lbs/acre	difference between high & low; %
	1	2	3	4	5	6	7	8	9	10	11	12	13		
	-----Lbs/acre per drill row-----														
wheat	32.0	35.6	47.7	27.1	40.2	48.0	49.7	50.3	36.3	41.5	48.9	39.2	32.9	40.7	85%
tall fescue	7.6	7.0	10.5	10.0	7.2	7.4	10.4	8.6	10.7	10.1	9.8	9.6	11.0	9.2	57%

Table 2. Seed (indiangrass, Virginia Wildrye, Barley) output from specific seed spouts from Truax Drill. (NC A&T).

Sprocket Setting	Drill spout #				Average	Deviation from mean	difference between high & low; %
	1	3	5	7			
Indiangrass lbs/acre/row							
1. small; large	2.5	3.4	3.0	3.3	3.0	0.4	36%
2. med: med	16.8	14.9	16.2	14.9	15.7	1.0	13%
3. large: small	26.6	21.6	22.0	28.1	24.6	3.3	30%
Va Wildrye lbs/acre/row							
3. large:small	22.8	25.4	30.2	34.1	28.1	5.0	49%
Barley lbs/acre/row							
1, original	87.8	73.5	74.5	63.7	75	9.9	37%
2, adjusted	63.1	82.1	-	86.3	77	12.4	36%

Drill width is 5.16' and row spacing is 7.75"

Table 3. Seed (Millet, Little bluestem, and *Coreopsis spp*) output from specific seed spouts from Truax Drill (Pee Dee).

Sprocket # & setting	down spout from left of machine looking from the back								Seeding Rate lbs/acre	Standard deviation	difference between high & low; %
	1	2	3	4	5	6	7	8			
Millet. Lbs/acre per drill row											
large, 5th;set 4.5	11.4	8.4	8.8	9.8	10.1	10.5	9.9	8.2	9.6	1.1	39%
med, 4th;set 3.0	4.5	5.2	6.5	6.1	6.1	5.2	5.0	7.6	5.8	1.0	69%
mid, 3rd;set 2.0	2.3	3.6	4.2	3.2	3.5	3.2	2.9	5.2	3.5	0.9	117%
Little Bluestem.Lbs/acre per drill row											
large, 5 th	4.6	4.6	4.6	4.8	4.6	5.0	5.0	4.6	4.7	0.2	9%
med, 4 th	7.9	8.9	9.4	7.8	9.2	9.4	8.2	8.1	8.6	0.7	21%
mid, 3 rd	13.1	15.4	16.3	15.0	17.0	14.8	14.6	13.0	14.9	1.4	30%
Coreopsis spp.Lbs/acre per drill row											
large, 5th;set 4.5	21.9	22.5	21.5	20.2	23.1	21.2	21.8	21.2	21.6	0.9	14%
med, 4th;set 3.0	5.8	5.6	5.9	5.6	5.5	5.0	6.5	6.2	5.8	0.4	30%
mid, 3rd;set 2.0	0.3	0.1	0.4	0.1	0.1	0.4	0.4	0.0	0.3	0.2	400%

Shaded blocks show the high and low seeding rate across the 8 seed drop spouts.

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Table 4. Seeding rate (lbs/acre when a specific number of seeds are found per sq foot.

Number of seeds found per sq. ft.	Alfalfa	Bermuda	Gama	Hairy Vetch	Oats	Orchardgrass	Pearl Millet	Red Clover	Rye	Rescue	Switchgrass	Tall Fescue Ryegrass	White Clover
	Estimated number of seeds per lb												
	220,000	2,000,000	7,000	20,000	16,000	600,000	88,000	275,000	18,000	50,000	390,000	227,000	800,000
lbs. of seed per acre													
1	0.2	0.02	6	2	3	0.1	0	0.2	2	1	0.1	0.2	0.1
2	0.4	0.04	12	4	5	0.1	1	0.3	5	2	0.2	0.4	0.1
4	0.8	0.1	25	9	11	0.3	2	0.6	10	3	0.4	0.8	0.2
6	1.2	0.1	37	13	16	0.4	3	1.0	15	5	0.7	1.2	0.3
8	1.6	0.2	50	17	22	0.6	4	1.3	19	7	0.9	1.5	0.4
10	2.0	0.2	62	22	27	0.7	5	1.6	24	9	1.1	1.9	0.5
12	2.4	0.3	75	26	33	0.9	6	1.9	29	10	1.3	2.3	0.7
14	2.8	0.3	87	30	38	1.0	7	2.2	34	12	1.6	2.7	0.8
16	3.2	0.3	100	35	44	1.2	8	2.5	39	14	1.8	3.1	0.9
18	3.6	0.4	112	39	49	1.3	9	2.9	44	16	2.0	3.5	1.0
20	4.0	0.4	124	44	54	1.5	10	3.2	48	17	2.2	3.8	1.1
25	5.0	0.5	156	54	68	1.8	12	4.0	61	22	2.8	4.8	1.4
30	5.9	0.7	187	65	82	2.2	15	4.8	73	26	3.4	5.8	1.6
40	7.9	0.9	249	87	109	2.9	20	6.3	97	35	4.5	7.7	2.2
50	9.9	1.1	311	109	136	3.6	25	7.9	121	44	5.6	9.6	2.7
60	11.9	1.3	373	131	163	4.4	30	9.5	145	52	6.7	11.5	3.3
70	13.9	1.5	436	152	191	5.1	35	11.1	169	61	7.8	13.4	3.8
80	15.8	1.7	498	174	218	5.8	40	12.7	194	70	8.9	15.4	4.4
90	17.8	2.0	560	196	245	6.5	45	14.3	218	78	10.1	17.3	4.9
100	19.8	2.2	622	218	272	7.3	50	15.8	242	87	11.2	19.2	5.4
110	21.8	2.4	685	240	299	8.0	54	17.4	266	96	12.3	21.1	6.0
120	23.8	2.6	747	261	327	8.7	59	19.0	290	105	13.4	23.0	6.5
130	25.7	2.8	809	283	354	9.4	64	20.6	315	113	14.5	24.9	7.1
140	27.7	3.0	871	305	381	10.2	69	22.2	339	122	15.6	26.9	7.6
150	29.7	3.3	933	327	408	10.9	74	23.8	363	131	16.8	28.8	8.2

¹ The number of seeds per lb. varies significantly due to differences in variety characteristics and from year-to-year due to differences in growing conditions.