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**DRILL BOX SURVEY**  
**of Spring Planted Grains in South Dakota**



**AGRONOMY DEPARTMENT**  
**AGRICULTURAL EXPERIMENT STATION**  
**SOUTH DAKOTA STATE UNIVERSITY, BROOKINGS**

## DRILL BOX SURVEY

By R. C. KINCH, Professor, and J. D. COLBURN, Assistant Professor of Agronomy, South Dakota State University; ELLSWORTH LEEN, State Weed Supervisor.

Many times the question has been asked — What kind and quality of seeds are South Dakota farmers planting?

In an effort to at least partially answer the question, a drill box survey was conducted in the early spring of 1964. The survey was a combined effort of individuals from the Seed Certification Service of the South Dakota Crop Improvement Association, State Department of Agriculture, Cooperative Extension Service, and Agronomy Depart-

ment of S. D. State University.

The county weed supervisor or assistant county agent collected the samples.

Permission was obtained to take a sample from the drill box or planter wherever a farmer was found to be planting. Several questions were asked each farmer at the time the sample was taken.

A total of 361 samples of the spring planted grains were collected in 15 counties representing all parts of the state.

**Table 1. Kinds of Weed Seeds Found and Number of Samples Containing the Different Weed Seeds**

Weed Seed	Durum Wheat	Spring Wheat	Oats	Barley	Flax	Total	% of Samples Containing Weed Seeds
<b>PRIMARY NOXIOUS WEEDS</b>							
Field bindweed .....		11	11	1	1	24	6.6
Leafy spurge .....		1	1			2	.5
Quackgrass .....	6	6	16	1	3	32	8.8
<b>SECONDARY NOXIOUS WEEDS</b>							
Wild oats .....	6	58	93	11	2	170	47.1
Wild mustard .....	2	25	76	8	3	114	31.5
Pennycress .....		1				1	.2
Hedge bindweed .....		3	4	1		8	2.2
<b>COMMON WEEDS</b>							
Wild buckwheat .....	5	66	135	7	7	220	60.9
Yellow foxtail .....	2	35	63	5	9	114	31.5
Green foxtail .....	3	30	46	4	2	85	23.5
Lambsquarters .....	2	21	37	3		63	17.4
Curled dock .....		2	24			26	7.2
Barnyardgrass .....	1	3	4	1	5	14	3.8
Lady's thumb .....		2	10		2	14	3.8
Wild rose .....		2	6			8	2.2
Japanese chess .....		1	7			8	2.2
Other weeds .....	1	7	14	1	5	28	7.7

Three kinds of primary noxious, four of secondary noxious, and 22 of common weeds were found in the

samples. It is obvious many kinds of noxious as well as common weed seeds are being planted.

**Table 2. Weed Seed Content of Cleaned and Uncleaned Samples**

	Samples		Primary Noxious		Secondary Noxious		Common Weeds		No Weeds	
	No.	%	No.	%	No.	%	No.	%	No.	%
Cleaned .....	250	69.3	41	16.4	136	54.4	222	88.8	36	14.4
Uncleaned .....	111	30.7	10	9.0	53	47.7	73	65.7	8	7.2

Over two-thirds of the samples were reported to have been cleaned. A higher percent of the cleaned samples had noxious and common weeds than the uncleaned samples. This was probably because the un-

cleaned lots were much better to start with and cleaning was not thought to be as badly needed.

It is evident the cleaning that was done was not accomplishing its objective.

**Table 3. Weed Seed Content of Home and Commercially Cleaned Samples**

	Samples		Primary Noxious		Secondary Noxious		Common Weeds		No Weeds	
	No.	%	No.	%	No.	%	No.	%	No.	%
Home cleaned ..	73	29.2	13	17.8	61	83.5	65	89.0	8	11.0
Commercially cleaned .....	177	70.8	28	15.8	128	72.3	157	88.7	26	14.6

There appears to be little difference in the weed seed content of

home and commercially cleaned seed.

**Table 4. Summary of Information on Seed Samples Taken from Drill Boxes in 15 South Dakota Counties**

Kind	No. of Samples	Cer-tified	Origin of Seed			Cleaned			Weed Seed Content			
			Own	Dealer	Neigh-bor	Home	Com-mercial	Treat-ed	Second-ary			
									Primary Noxious	ary Noxious	Common Weed	No Weed
Oats ....	198	2	125	18	6	49	75	5	26	97	166	12
Wheat	124	13	74	12	13	14	88	36	19	75	97	23
Barley	22	1	8	2	1	1	12	2	2	12	15	4
Flax ....	17		8	4		9	2		4	5	14	3
<b>Total ..</b>	<b>361</b>	<b>16</b>	<b>215</b>	<b>36</b>	<b>20</b>	<b>73</b>	<b>177</b>	<b>43</b>	<b>51</b>	<b>189</b>	<b>292</b>	<b>42</b>
<b>% of Total</b>	<b>4.4</b>		<b>59.5</b>	<b>9.9</b>	<b>5.6</b>	<b>20.2</b>	<b>49.0</b>	<b>11.9</b>	<b>14.1</b>	<b>52.3</b>	<b>80.8</b>	<b>11.6</b>

Over one-eighth (14.1%) of the seed lots contained primary noxious weed seeds, with 6.6% containing seed of the number one noxious weed of this state—field bindweed, sometimes known as creeping jenny.

A total of 5,186,000 acres were estimated to have been planted to spring wheat, oats, barley, and flax in the spring of 1964. This would mean that 342,276 acres of crop land were planted to field bindweed last spring.

Over one-half of the samples contained secondary noxious weed seeds (principally wild oats and wild mustard). Accordingly, an estimated 2,712,278 acres were infested with these weeds.

Over four-fifths of all samples contained one or more of the common weed seeds.

It is apparent that a large amount of South Dakota crop land is being infested or reinfested with weeds each year by the planting of contaminated crop seeds.

#### **Discussion**

The reason for the failure of the cleaning operation to clean the seed could not be determined from this study. However, the authors feel that the failure is not due as much to the cleaning machinery as it is to the operators who (1) overload the machinery and (2) fail to remove a sufficient amount of reject (light and off-sized) material.

Some weed seeds are virtually impossible to clean out of certain

crop seeds. Examples are field bindweed, hedge bindweed, and wild rose in wheat, oats, and barley; wild oats in oats and barley; and lady's thumb in flax. When such weed seeds are found in crop seeds, other seed supplies free of these weed seeds should be used.

Proper screens and adjustments and careful operation of a good fanning mill can remove practically all of the other weed seeds from the four crop seeds. Do not attempt cleaning when crop seeds are contaminated with the above mentioned weed seeds. Locate new supplies of weed-free seed instead. The cost of seed is a small percentage of the total production costs involved in producing a good crop.

A plan was initiated in 1963 for South Dakota to approve processors of certified seed. These processors agree to take extra care in their seed cleaning jobs. At present, there are 14 approved processors in the state.

Results of this study indicate that better cleaning practices are vitally needed. Certified approved processors are a step in this direction. Only 4.4% of these samples were from certified seed.

Certified seed is field and laboratory inspected to assure farmers seed is free from primary and secondary noxious weeds. It assures the purchaser of high quality seed with known genetic and varietal purity, high germination, high mechanical purity, and freedom from noxious weed seeds.