DEER BROOMCORN

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Origin And History

At the Illinois Agricultural Experiment Station a program was begun in 1958 to develop a high yielding, tan plant color, dwarf broomcorn without center stem and with resistance to anthracnose. The initial plant material consisted of F_2 to F_6 lines derived from a cross between Rennels Dwarf No. 11 and Illinois No. 1. The latter was resistant to anthracnose, and was developed from a cross involving either Shallu or Leoti sorgo as sources of tan plant and disease resistance.

Illinois No. 1 was also one parent of Okaw, a disease resistant standard variety developed in the Illinois program. Probably this same material was the source of Plains 1 and Plains 2, broomcorn varieties released by the New Mexico Station (1).

Deer broomcorn and two sister lines were selected by Dr. H. H. Hadley using the pedigree method of breeding. They were tested as Illinois Selection Numbers 404, 418 and 433. Seed of these selections was

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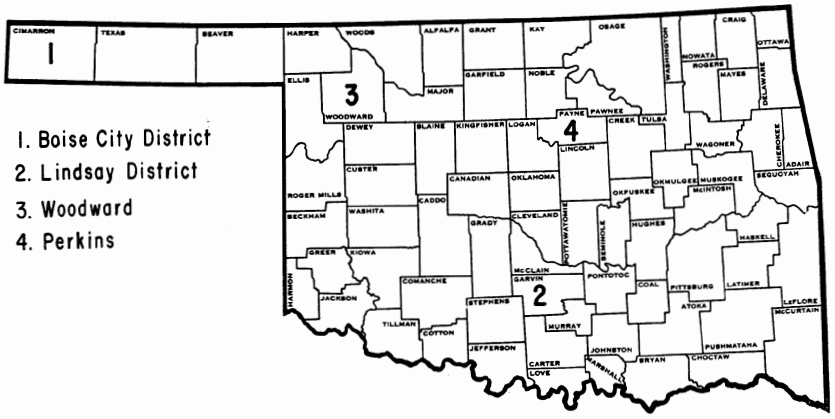

Figure 1. The Boise City and Lindsay Districts are the primary production areas for broomcorn in Oklahoma. Woodward and Perkins are Experiment Station field tests locations where broomcorn lines are screened and tested prior to release.

distributed to Oklahoma, Colorado and New Mexico in the spring of 1965. In Oklahoma these selections were grown in observation rows at Perkins and Woodward. In 1966 and 1967 they were grown in yield trials at Woodward and in observations rows in the anthracnose area of the Panhandle. Selection No. 433 appeared inferior. Selection Nos. 404 and 418 were somewhat similar, but Selection No. 418 appeared superior and was named Deer and released in 1968.

Need For Broomcorn Improvement

There are two general areas of broomcorn production in Oklahoma. The Lindsay district and the Boise City district, which includes the Panhandle counties, are where significant acreages of the crop are produced.

The predominate variety in the Lindsay area is Black Spanish, a standard-height plant with high quality brush, having the seeds distributed over the distal half of the fibers. Black Spanish is a quick maturing variety that can be sown from April through July in this area. The crop is "tabled," "cut" from the table, "seeded," and cured on racks in a shelter before being "baled." Black Spanish is very susceptible to anthracnose (*Colletotricum graminicolum*), one of the major diseases of broomcorn in this area.

Dex variety is resistant to the stalk rotting phase of the disease and since its release in 1964 (2), has been grown increasingly in this area. It lodges less frequently than Black Spanish and being dwarf it does not need to be "tabled," thus requiring less labor for harvest.

In the Boise City area the predominate variety appears to be Rennels Dwarf No. 11. It is a tan, western dwarf-height plant with long brush, having the seeds near the tip (hurl-type brush). Rennels Dwarf No. 11 is not tabled, but it is "pulled" while the plant is in a standing position. The brush is field cured on the ground in small, loose bundles wedged between stalks in the row. When cured, it is gathered with sleds and piled in ricks in the open until it can be seeded and baled.

Recently anthracnose has adversely affected production of Rennels Dwarf No. 11 variety in this area. It is very susceptible to the disease. Dex resists the disease but has not been accepted by the growers or buyers. A broomcorn with brush more closely resembling that of Rennels Dwarf No. 11 seems to be preferred.

Description

The plant characteristics of Deer resemble the Rennels Dwarf No. 11 parent. Both have plant color of tan compared to red for Dex; the glumes of Deer are tan to sienna and nearly cover brown kernels. The heads (brush) have fibers as long or longer than Rennels Dwarf No. 11

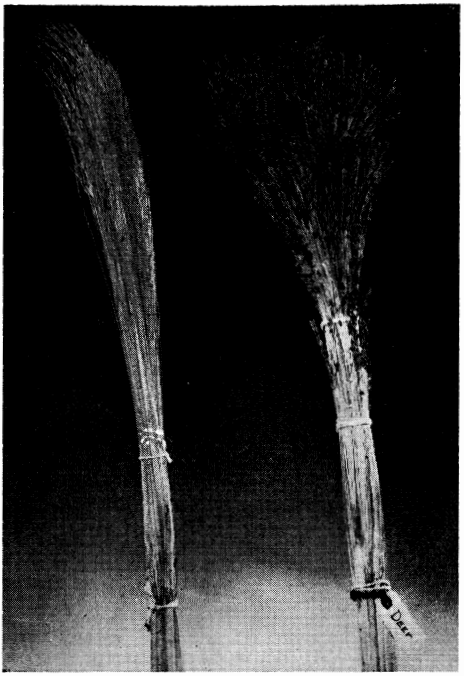

Figure 2. Deer broomcorn without and with the seed.

and the heads are exserted to about the same degree. Seed-bearing branches, however, occur along more of the length of the fibers. Deer has shown resistance to anthracnose in five years of testing in Illinois and two years of testing in the Panhandle and at Perkins.

Performance

The tables give yield and agronomic data for Deer in comparison with three common varieties. Data were available from only one location in Oklahoma. Yields from Springfield, Colorado and Urbana, Illinois, are reported. In all of the comparisons in Table 1, Deer was superior. The data represent only two years of yield data for any one location.

The agronomic data in Table 2 shows that Deer is similar to Rennels Dwarf No. 11 in maturity, at Woodward, but appeared to be earlier at Springfield. It was shorter and had slightly longer brush at both Woodward and Springfield.

Tables 3 through 6 give yields and agronomic data for individual years at Woodward and Springfield. Table 7 gives yield data from Urbana by years. It is believed that anthracnose was not a factor in production at Woodward or Springfield. Had disease been present, yield superiorities might have been greater for Deer.

In Table 8 disease readings are shown for both leaf and stalk phases of anthracnose in Cimarron County, Oklahoma. Deer showed a marked improvement over Rennels Dwarf No. 11 and Black Spanish in both readings.

Literature Cited

1. Hsi, David C. H., and Norman R. Malm. Plains 1 and Plains 2: New Broomcorn Varieties Resistant to Anthracnose Stalk Rot. New Mexico Agr. Exp. Sta. Bull. 525. 1968.
2. Weibel, D. E., H. C. Young, Jr., E. E. Saari, B. Ott, N. Ford, and R. A. Hunter. Disease Resistance of Broomcorn Varieties, Cimarron County. Okla. Agr. Exp. Sta. Processed Series P-489. 1965.

Table 1: Average Brush Yields for Broomcorn Varieties Grown at Woodward, Oklahoma, Springfield, Colorado, and Urbana, Illinois.

Variety	Pounds good brush/acre				
	Woodward 1966-67	Springfield 1965,67[1]	4-Sta. Av.	Urbana 1964,66,67	7-Sta. Av.
Deer	707	640	673	903	772
Rennels Dwarf No. 11	544	606	575	511	548
Black Spanish	313	605	459	764	590
Dex	448	385	416	—	—

[1]Springfield data provided by H. O. Mann, Southeastern Colorado Branch Experiment Station.

Table 2: Average Agronomic Data for Broomcorn Varieties Grown at Woodward, Oklahoma in 1966 and 1967, and at Springfield, Colorado in 1965 and 1967.

Variety	Days to Heading		Plant Height, In.		Brush Length, In.	
	Wood.	Spring.[1]	Wood.	Spring.[1]	Wood.	Spring.[1]
Deer	82	96	70	64	21.5	16.3
Rennels Dwarf No. 11	82	101	74	74	21.0	15.4
Black Spanish	70	84	114	79	19.5	17.2
Dex	77	89	73	49	19.0	14.3

[1]Springfield data provided by H. O. Mann, Southeastern Colorado Branch Experiment Station.

Table 3: Broomcorn Variety Test, Woodward, Oklahoma, 1967.

Variety	Days to		Plant	Lbs. Brush/A		Percent	Brush
	Head	Harvest	Height In.	Total	Good	Good Brush	Length In.
Deer	79	106	68	823	688	84	23
Rennels Dwarf No. 11	80	106	73	580	560	97	22
Black Spanish	69	95	112	577	185	32	19
Dex	74	98	68	697	307	44	20
L.S.D. (.05)					114		

Table 4: Broomcorn Variety Test, Woodward, Oklahoma, 1966.

Variety	Days to		Plant	Lbs. Brush/A		Percent	Brush
	Head	Harvest	Height In.	Total	Good	Good Brush	Length In.
Deer	85	99	72	725	725	100	20
Rennels Dwarf No. 11	83	99	74	542	528	97	20
Black Spanish	71	84	115	505	440	87	20
Dex[1]	80	97	78	673	588	87	18
L.S.D. (.05)					49		

[1]Data from adjoining test.

Table 5: Broomcorn Variety Test, Springfield, Colorado, 1967[1].

Variety	Days to	Plant	Lbs. Brush/A		Good	Brush
	Bloom	Height In.	Total	Good	Brush Pct.	Length In.
Deer	105	58	765	585	76.5	15.2
Rennels Dwarf No. 11	109	68	667	515	77.2	13.5
Black Spanish	90	74	689	566	82.1	15.8
Dex	95	42	857	434	50.6	15.0
L.S.D. (.05)				77		.9

[1]Data provided by H. O. Mann, Southeast Colorado Branch Experiment Station.

Table 6: Broomcorn Variety Test, Springfield, Colorado, 1965[1].

Variety	Days to Bloom	Days to Harvest	Plant Height In.	Lbs. Brush/A Total	Lbs. Brush/A Good	Good Brush Pct.	Brush Length In.
Deer	87	119	69	970	695	71.7	17.5
Rennels Dwarf No. 11	92	123	79	944	697	73.9	17.3
Black Spanish	77	103	103	959	644	67.2	18.5
Dex	82	113	55	944	335[2]	33.7	13.5
L.S.D. (.05)					182		

[1]Data provided by H. O. Mann, Southeastern Colorado Branch Experiment Station.
[2]Extremely high percentage of recurved brush was responsible for low percentage of good brush.

Table 7: Broomcorn Variety Test, Urbana, Illinois, 1964, 1966, and 1967.

Variety	Total Brush Yield Lbs./A				Good Brush Yield Lbs./A			
	1964	1966	1967	Av.	1964	1966	1967	Av.
Deer	977	1385	1130	1164	812	711	1127	903
Rennels Dwarf No. 11	969	1022	1056	1016	231	281	1020	511
Black Spanish	997	1458	1184	1213	711	605	977	764
L.S.D. (.05)					225	225	126	

Table 8: Anthracnose Disease Ratings, Leaf and Stalk Phases, Taken on Williams Farm (W) and Green Farm (G), Cimarron County, Oklahoma, 1966 and 1967[1].

Variety	Leaf Phase 1966			Stalk Phase 1966		Stalk Phase 1967	Av.
	W	G	Av.	W	G	W	
Deer	1.0	1.5	1.3	1.5	1.0	1.5	1.3
Rennels Dwarf No. 11	5.5	3.5	4.5	6.0	4.0	3.5	4.5
Black Spanish	5.0	3.5	4.3	7.0	3.5	6.5	5.7
Dex	2.0	1.5	1.8	1.0	1.0	1.0	1.0

[1]Disease ratings taken on a scale from 1 for no disease to 9 for plants dead, average of two readings.

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