

COMPARISON OF COWPEA, LABLAB, AND HAY TYPE SOYBEAN GROWTH AND DEFOLIATION BY DEER

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Background. Previous cafeteria grazing trials with summer annual legumes and grasses have shown that non-native deer and elk prefer the large seeded legumes. Soybean, cowpea and lablab were eaten before small seeded legumes such as alyceclover, and grasses such as forage sorghums and millets. Legumes resemble forbs (broadleaf plants) that are desired by both native and non-native deer. Legumes are more digestible and higher in protein, phosphorus, calcium, and magnesium than grasses. Three forage type soybean varieties have been released recently that remain vegetative during the summer. Unlike regular soybeans they require a short day length to flower that does not occur until fall. Iron and Clay cowpea, Tecomate lablab, Donegal soybean (Group V), Derry soybean (Group VI), and Tyrone soybean (Group VII) were drilled in a prepared seedbed in 7-in. rows on May 24, 2000. No fertilizer was applied since soil analysis showed adequate levels of nitrogen, phosphorus, and potassium. Plant density was 5.7 seedlings/ft² for Iron and Clay cowpea and from 2.9 to 4.1 seedlings/ft² for the other entries. Beginning on June 6 (2 weeks after planting), plots were sampled weekly for 5 weeks to record leaf, petiole (leaf stem), stem, and total weight. Red deer grazed the study from July 11 to 18 and defoliation was recorded daily by three individuals.

Research Findings. Iron and Clay cowpea generally had greater leaf, petiole, and stem weights than the other entries (Table 1). There were seldom any differences among the three soybean varieties. Differences in leaf weight for Tecomate lablab and soybean varieties were limited to 2 and 3 weeks after planting. Tecomate lablab along with Iron and Clay cowpea had greater petiole weights than the soybean varieties at 5 and 6 weeks after planting. Iron and Clay cowpea always had the greatest stem weight. The highest yielding entry at every sampling date was Iron and Clay cowpea. The only yield difference among the other entries was at the first sampling date when lablab yield was less than the soybean varieties. Cowpeas are well adapted to the sandy acid soils of northeast Texas which is probably part of the reason for their faster growth. Soybeans are better adapted to loam and clay type soils if they are well drained.

The soybean varieties were eaten first with no defoliation differences among the three soybean varieties (Table 2). Deer did not consume any of the cowpea or lablab until July 15 when the soybeans were completely defoliated. Defoliation of Tecomate lablab was greater than Iron and Clay cowpeas after the first three days.

Application. The order of preference by red deer was soybeans>lablab>cowpea. Although cowpeas were eaten last, they were always eaten before grasses in previous grazing studies by non-native deer. The main criteria for selecting which of these legumes to plant for native and non-native deer should be based on adaptability to soil type and climate.

Table 1. Growth comparison of large seeded legumes.

Entry	Weeks after planting				
	2	3	4	5	6
	Leaf weight/5 plants (g)				
Iron and Clay cowpea	1.6 a=	4.0 a	11.1 a	22.7 a	19.5 a
Tecomate lablab	0.9 c	1.8 bc	6.5 b	15.6 b	29.2 a
Donegal soybean	1.3 b	3.2 ab	7.1 b	10.3 b	21.8 a
Derry soybean	1.0 c	3.0 a-c	6.6 b	9.8 b	21.6 a
Tyrone soybean	1.0 c	2.1 c	5.7 b	12.6 b	16.7 a
	Petiole weight/5 plants (g)				
Iron and Clay cowpea	.03 a	.60 a	2.90 a	7.28 a	8.08 ab
Tecomate lablab	.05 a	.45 ab	1.63 b	5.35 b	10.33 a
Donegal soybean	.05 a	.30 b	1.38 b	2.38 c	5.60 bc
Derry soybean	.04 a	.35 ab	1.20 b	2.70 c	6.08 bc
Tyrone soybean	.04 a	.20 b	1.20 b	3.25 c	4.70 c
	Stem weight/5 plants (g)				
Iron and Clay cowpea	.55 a	1.48 a	4.85 a	10.55 a	25.05 a
Tecomate lablab	.27 c	.88 bc	2.00 c	5.40 b	19.83 ab
Donegal soybean	.44 ab	.63 c	3.43 b	6.23 b	14.40 bc
Derry soybean	.35 bc	1.28 ab	2.95 bc	5.90 b	13.50 bc
Tyrone soybean	.41 a-c	1.08 ab	2.93 bc	7.43 b	10.53 c
	Yield (lb dry matter/acre)				
Iron and Clay cowpea	240 a	670 a	2090 a	4490 a	5840 a
Tecomate lablab	70 d	200 b	570 b	1480 b	3340 b
Donegal soybean	120 b	330 b	810 b	1290 b	2860 b
Derry Soybean	110 bc	350 b	850 b	1460 b	3270 b
Tyrone soybean	95 c	210 b	650 b	1530 b	2100 b

=Values in a column for each plant component followed by the same letter are not significantly different at 0.05 level.

Table 2. Daily defoliation of legumes by red deer.

Entry	July 12	July 13	July 14	July 15	July 17	July 18
	-----Defoliation (%)-----					
Iron and Clay cowpea	0 a=	0 b	2 b	4 c	31 b	84 b
Tecomate lablab	0 a	0 b	2 b	26 b	97 a	100 a
Donegal soybean	12 a	66 a	100 a	100 a	100 a	100 a
Derry soybean	24 a	74 a	100 a	100 a	100 a	100 a
Tyrone soybean	20 a	68 a	100 a	100 a	100 a	100 a

=Values within a column followed by the same letter are not significantly different at 0.05 level.