Fall-planted Forage Mixtures for White-tailed Deer

Blaine Jernigan
Rusk County Extension Agent

Overton	Rusk	_____
Town/Community	County	Precinct

Summary:

Forage combinations including Iron and Clay cowpea, Heavygrazer oats and Apache arrowleaf clover were established at TAMU-Overton on August 27, 2003 to determine ideal seeding rates for maximum production of these varieties established in the fall. The seedbed was disked and seed were broadcast in 10' x 20' plots with six seed mixture treatments arranged in a random block design with three replications of each treatment. The plot area was lightly rolled after seeding to insure good seed to soil contact. Seeding rates (pounds per acre) of cowpeas, oats and arrowleaf clover were (20, 20, 10), (25, 15, 10), (30, 10, 10), (40, 40, 10), (50, 30, 10) and (60, 20, 10), respectively. Cowpea production in October and November 2003 increased as seeding rates increased but restricted oat production regardless of the oat seeding rate. Oat and arrowleaf clover production began to increase after cowpeas were killed by a frost in late November. Oat production generally increased in December and January as the seeding rate increased to the maximum rate of 40 pounds per acre. Arrowleaf clover became the only viable plot component after April and production ranged from 7,510 pounds per acre to 10,669 pounds per acre in June. Based on these results, we recommend an early fall-planted combination of 40 pounds of cowpeas, 40 pounds of oats and 10 pounds of arrowleaf clover to maximize forage availability from fall to early summer.

Problem:

Numerous forage combinations are utilized to increase the nutritional plane and attract white-tailed deer for harvest. However, most of these commercially available forage combinations do not consider variety compatibility (i.e. degree of competition) between varieties in the mixture and its associated impacts on production and availability. Furthermore. Spring-planted forages tend to decline in quality and abundance in September through November, while traditional fall planted forages (i.e. clovers and small grains) do not produce sufficient quantities of forage to reliably attract deer for the archery and/or Managed Lands Deer Permit seasons beginning in late September/early October each Fall. The combination of warm and cool season forage varieties established in late Summer/early Fall when soil moisture is present has the potential to provide forage soon after planting to serve as an attractant but also provide adequate forage throughout the cool season and into the transition period in early summer when fall-planted varieties mature and Spring planted forages first become available.

Objectives:

1. To determine the forage production potential of mixtures of warm and cool season forages established in late summer/early Fall
2. To evaluate the effect of seeding rates on establishment and forage yield of each component of the mixture and
3.To identify an optimum mix of cowpeas, oats and arrowleaf clover for fall-planted supplemental forage plots for white-tailed deer.

Materials and Methods:

A random block design of 6 seeding rate combinations replicated 3 times each was established using 20' x 10' plots. The seeding rate (pounds per acre) treatments for cowpeas, oats and arrowleaf clover were (20, 20, 10), (25, 15, 10), (30, 10, 10), (40, 40, 10), (50, 30, 10) and (60, 20, 10), respectively. Plots were planted on August 27, 2003 by hand-seeding followed by roller packing to ensure good seed to soil contact. Cowpeas and clover seeds were inoculated prior to plot establishment. Plots were monitored every 30 days and forage samples were harvested from one square foot quadrants from all plots beginning in October 2003 and ending in June 2004 (seven harvests per plot). Forage samples were oven dried and weights were recorded by forage variety to estimate forage standing crop for each sampling period.

Results:

Cowpea production on the October and November harvest dates was directly related to the seeding rate. Cowpea forage yields in October ranged from 850 pounds per acre to over 2000 pounds per acre as seeding rates increased from 20 to 60 pounds per acre. Similar responses were noted for the November harvest date. The high cowpea production during these sampling periods restricted oat production regardless of the oat seeding rate utilized. Cowpea production peaked during November and all cowpea plants were killed by a hard freeze on November 24, 2004.

In early January 2004 Apache arrowleaf clover yield was highest at the low cowpea planting rates, reflecting the effect from previous competition from the thick stands of cowpea. Oat forage yield in this same period did not show the same response to the cowpea planting rate. In January, the higher oat seeding rates produced more forage even in the mixtures with high cowpea planting rates.

In March, both the oats and arrowleaf clover produced the highest forage yields in the mixtures that included the low cowpea planting rates.

By mid-April, the oats were in soft dough stage and there were no differences in total forage yield or in the oat component production of the six treatments. The highest three planting rates of cowpeas (40, 50 and 60 pounds per acre) still suppressed arrowleaf clover production during this month.

In June 2004, the Apache arrowleaf clover was in full bloom with some green seed set. Arrowleaf clover yielded standing crops of 7,510 to 10,669 pounds per acre and were not significantly different from each other except at the 60/20 pound per acre seeding rate for cowpeas and oats, respectively used in conjunction with the clover.

Table 1. Variety and total standing crop estimates of six cowpea/oat/arrowleaf clover deer forage combinations established at TAMU-Overton, August 2003.

Seeding Rates (lbs/ac) Cowpea	Oats	Clover	October	November	December	January	March	April	June
20	20	10	cp 885 a * o 314 a, b c - 1199 a	2008 a 230 a, b - 2238 a	1618 a 335 a - 1953 a	- 445 a 377 a 822 a, b	- 2344 a 1580 a 3924 a	- 5706 a 3905 a 9611 a	- - 9691 a 9691 a
25	15	10	cp 889 a o 518 a c - 1407 a	1660 a 345 a - 2005 a	1593 a 192 a - 1785 a	- 688 a, b 201 b, a 889 a, b	- 1410 b, c 1100 a, b 2510 b	- 4311 c 3694 a 8005 c	- - 9191 a 9191 a
30	15	10	cp 1427 a, b o 95 b c - 1522 a	2357 a 259 a, b - 2616 a, b	1490 c 301 a - 1791 a	- 490 a 244 b 714 b	- 1471 b 784 b, c 2255 b	- 5447 a 3982 a 9429 a	- - 10,452 a 10,452 a
40	40	10	cp 1491 a, b o 132 b c - 1623 a	3269 b, c 227 a, b - 3496 b	1692 a 927 b - 2619 a, b	- 1100 c 38 d 1138 a	- 1055 b, c 860 b, c 1916 b, c	- 5341 a 3505 a, b 8846 a	- - 10,669 a 10,669 a
50	30	10	cp 1882 a, b o 63 b c - 1945 a	3643 c 45 b - 3688 b	3086 a 515 a, b - 3601 b	- 854 b, c 42 d 896 a, b	- 809 b, c 496 c 1305 c	- 4877 a 3179 a, b 8056 a	- - 9652 a 9652 a
60	20	10	cp 2046 b o 45 b c - 2091 a	3732 c 35 b - 3767 b	2949 a 441 a - 3390 b	- 729 b c 86 c d 815 a b	- 726 c 652 b c 1378 c	- 6905 a 2648 b 9553 a	- - 7510 b 7510 b

* Values in columns followed by the same letter are not significantly different from each other at the $p \leq 0.05$ level.

Recommendations:

Based on a criteria of providing forage in early Fall and maintaining abundant forage throughout the Winter and Spring, we recommend seed mixture of 40 pounds per acre of Iron and Clay cowpea, 40 pounds per acre of Heavygrazer oats and 10 pounds per acre of Apache arrowleaf clover established in late August/early September when soil moisture is present. This combination will provide supplemental forage for white-tailed deer from early October well into June.

Conclusions:

Combinations of Iron and Clay cowpea, Heavygrazer oats and Apache arrowleaf clover are compatible forages when established at the appropriate seeding rate and when established in early Fall can increase the nutritional plane and serve as an attractant for white-tailed deer.

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