PRONGHORN AGE REPORT

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Robin Jennison
Secretary

Prepared by

Matt Peek
Resarch Biologist

Joe Kramer, Director
Fisheries and Wildlife
Division

Mike Mitchener, Wildlife
Section Chief

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PRONGHORN AGE REPORT

Prepared by Matt Peek, Research Biologist

Background

Successful pronghorn hunters are asked annually to provide incisors from their pronghorn to the Kansas Department of Wildlife, Parks and Tourism for determination of age characteristics of the harvest. Fawns and yearlings are classified based on tooth replacement and structure. Pronghorn cannot be aged reliably by incisor wear (their tooth roots grow continuously so teeth do not shorten noticeably from wear), so teeth from older age classes are sent to Matson's Laboratory, LLC in Milltown, MT for cementum aging analysis. This is a process through which teeth are sectioned and stained to determine the number of annually formed cementum rings present.

In 2009 and 2010, the Department also asked hunters to provide horn length and circumference measurements from any buck they harvested (appendix 1). With horn data lacking, age is often considered somewhat reflective of horn size, such that an older age class is considered reflective of better buck "quality." Collecting horn measurements will allow us to evaluate the age-horn size relationship.

Analyses were conducted in SAS 9.2. Comparisons were made using the GLM procedure, and Fisher's least-significant-difference test was used to differentiate variables in cases of significance.

Results

Between the years of 1994 and 2010, a total of 1636 pronghorn were aged. Mean age of does (≥ age 1) was 3.65 years (n = 121), with two reaching a maximum age of 12. Does and fawns comprise a small percent of total harvest (see Figure 1) and were excluded from further analysis.

The number of bucks aged per year ranged from 55 in 2002 to 141 in 1995 (Table 1). Mean age of bucks (≥ age 1) was 2.68 years (n = 1442), with a maximum age of 14. Mean age per year ranged from 2.36 in 1998 and 2004 to 3.00 in 2006 (Table 1, Figure 2). The number of bucks found in each age class is provided in Table 2.

Pronghorn hunting units have been the same since 2001 (see Appendix 1). The mean age of bucks by unit since that time is found in Figure 3. There was no statistical difference in the age of bucks harvested in each of the three units (P = 0.074).

The mean age of bucks by permit type since 2001 is found in Figure 4. A muzzleloader pronghorn season was first established in 2001, and muzzleloader hunting was first allowed in Unit 18 in 2010. There was no statistical difference in the age of bucks harvested among the 3 permit types (P = 0.687).

We received 242 horn length measurements and 231 horn circumference

measurements. In 2009, the mean horn length and circumference was 11.87 and 5.86 inches, respectively. In 2010, the measurements were 12.27 and 5.95 inches, respectively. Horn length and circumference measurements by age can be found in Figures 5 and 6, respectively. Mean horn length and circumference by age can be found in Figures 7 and 8, respectively. There is considerable variation in horn size within age classes, but yearlings generally had horns that were shorter ($P < 0.001$) and had smaller circumference ($P < 0.001$) than other age classes. There was no difference in horn lengths or circumferences between other age classes. There was also no difference in horn lengths ($P = 0.136$) or circumferences ($P = 0.603$) between the three units (Figures 9 and 10, respectively). Horn length of pronghorn harvested by muzzleloader permit holders was longer than those harvested by archery permit holders ($P = 0.0189$), but neither varied from horn lengths of pronghorn harvested by firearms hunters (Figure 11). Circumferences between the different permit types did not vary ($P = 0.555$; Figure 12).

Discussion

Pronghorn age information is useful in assessing the status of the herd over time, and can be a useful consideration is determining permit allocations the following year. The mean age of harvested bucks has declined each of the past four years after a record high in 2006, but the long term trend is slightly increasing. Though age is generally considered somewhat reflective of horn quality, yearlings were the only age class that statistically differed from the others. However, additional variation in year classes may emerge with additional years' horn data. Conversely, the selection of larger horned pronghorn by hunters may skew the horn size of older age classes downward (with larger bucks being more likely to be harvested, only smaller bucks may exist by the older age classes) and blur the potential variation in horn size by age class.

Among the key findings in this report is that pronghorn age structure and horn size are similar between the units, and a particular "trophy unit" does not surface as a result of these analyses. Age structure and horn size are also similar between the permit types. Though muzzleloader permit holders did harvest pronghorn with longer horns than archery hunters, neither varied significantly from firearms hunters, and there was no difference between the age of harvest by the different permit types.

Another interesting finding is that some of the pronghorn classified into the yearling age class had such large horn size. Though human error or atypical tooth development or wear may account for some of this, these animals may have just had great trophy potential. Until recently the world record pronghorn (B&C score: 93 4/8) was a 3-year old. Additional investigations into this issue will continue.

Conclusions

Age information is helpful in assessing the status of the pronghorn herd, and the addition of horn size data adds an additional element to be evaluated. As additional horn measurements are collected, it is possible that variation in herd characteristics may emerge. We will continue to collect teeth and horn measurements for at least the next few seasons.

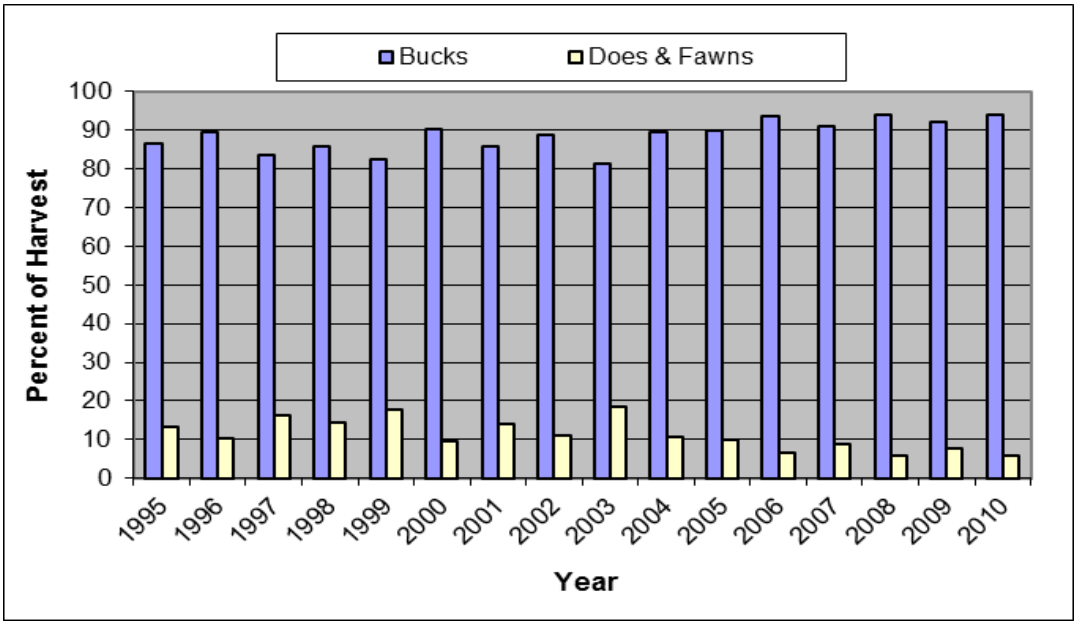


Figure 1. Percent of pronghorn harvest in Kansas from 1995 to 2010 comprised of bucks and does and fawns.

Table 1. Age information of yearling and older buck pronghorn harvested in Kansas from 1994-2010.

Year	(n)	Mean	Std Dev	Maximum	Std Error
1994	98	2.85	1.71	9	0.172
1995	141	2.68	1.73	12	0.145
1996	96	2.38	1.72	11	0.175
1997	108	2.58	1.51	8	0.145
1998	89	2.36	1.43	8	0.152
1999	76	2.91	1.55	8	0.178
2000	71	2.65	1.52	8	0.181
2001	89	2.76	1.50	6	0.159
2002	55	2.45	1.48	8	0.199
2003	59	2.75	1.53	9	0.199
2004	59	2.36	1.21	5	0.158
2005	75	2.69	1.81	9	0.209
2006	75	3.00	2.29	14	0.264
2007	66	2.95	1.61	8	0.198
2008	80	2.85	1.55	8	0.173
2009	102	2.78	1.49	8	0.148
2010	103	2.54	1.39	8	0.137
	1442	2.68	1.61	14	0.042

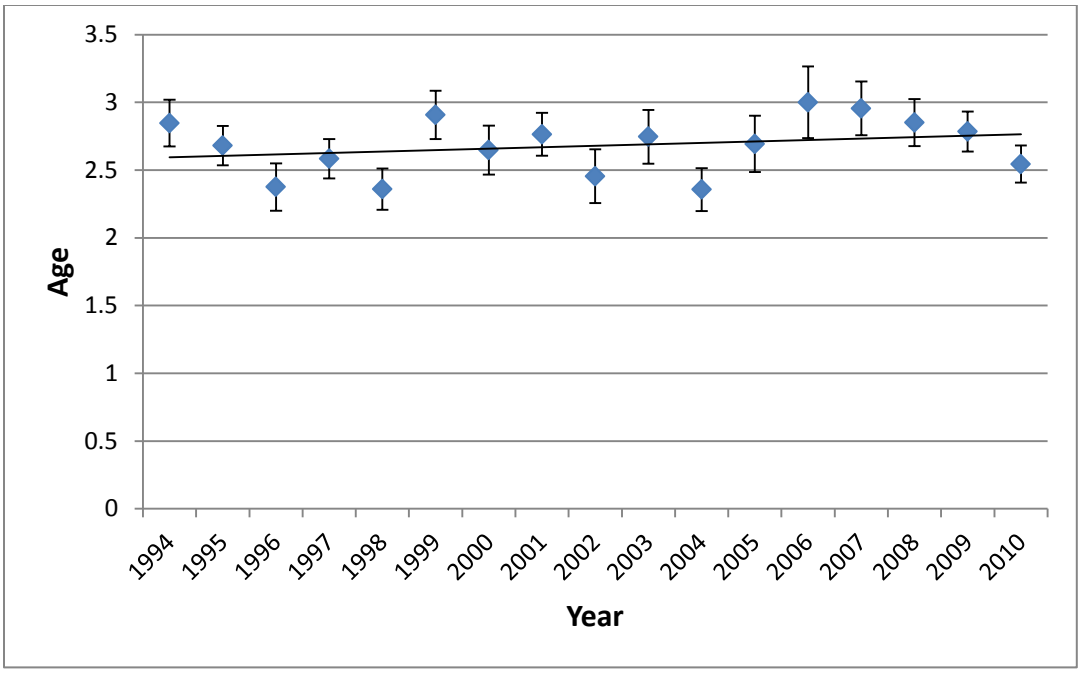


Figure 2. Annual mean age and SE of pronghorn bucks harvested in Kansas between 1994 and 2010.

Table 2. Ages of pronghorn bucks harvested in Kansas between 1994 and 2010.

Age	Number	Percent
1	372	25.8
2	398	27.6
3	327	22.7
4	180	12.5
5	82	5.7
6	43	3.0
7	13	0.9
8	20	1.4
9	4	0.3
11	1	0.1
12	1	0.1
14	1	0.1
	1442	100

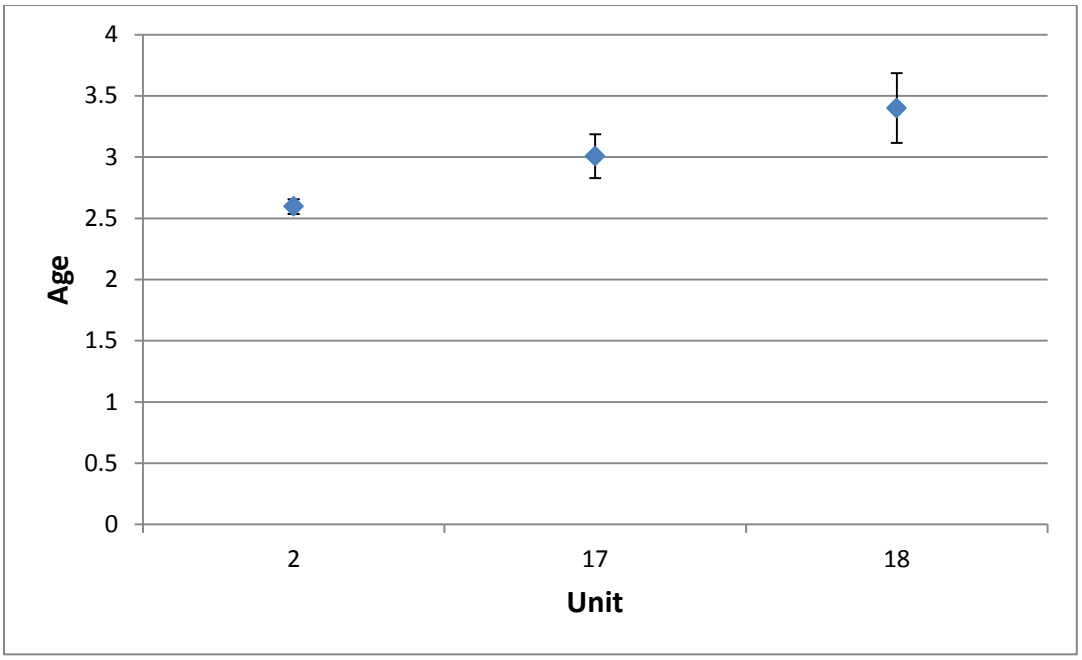


Figure 3. Mean age and SE of pronghorn bucks harvested in each of the 3 units open to hunting in Kansas from 2001-2010. There was no significant difference in age between the 3 equipment types (P = .074).

Figure 4. Mean age and SE of pronghorn bucks harvested by archery, muzzleloader, and firearms permit holders in Kansas from 2001-2010. There was no significant difference in age between the 3 permit types (P = 0.687).

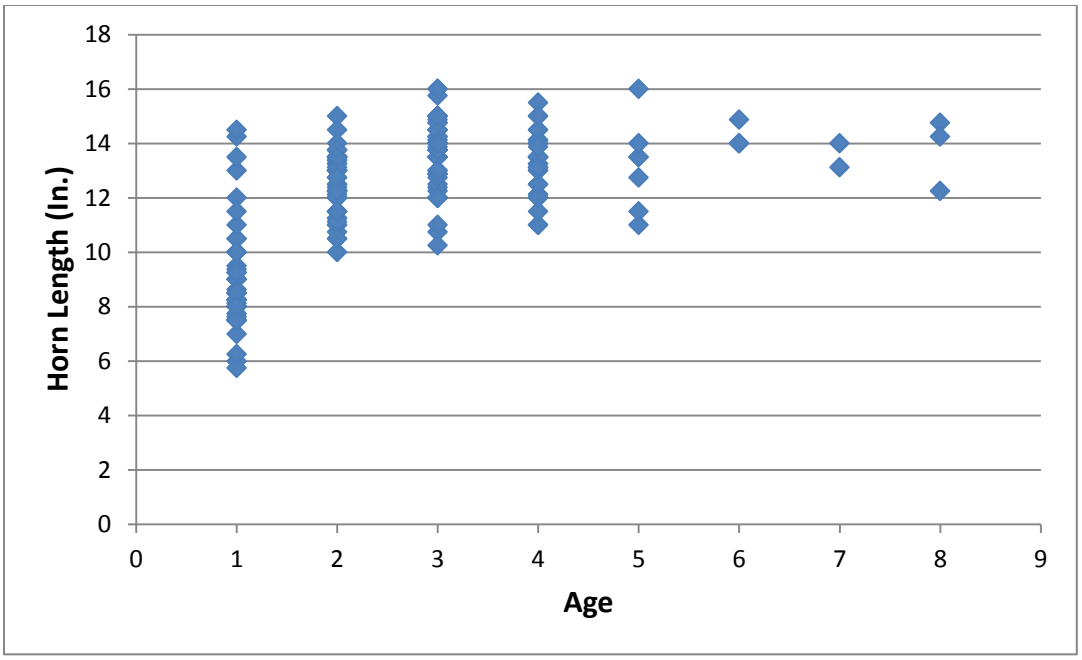


Figure 5. Horn lengths by age of pronghorn bucks harvested in Kansas in 2009 and 2010.

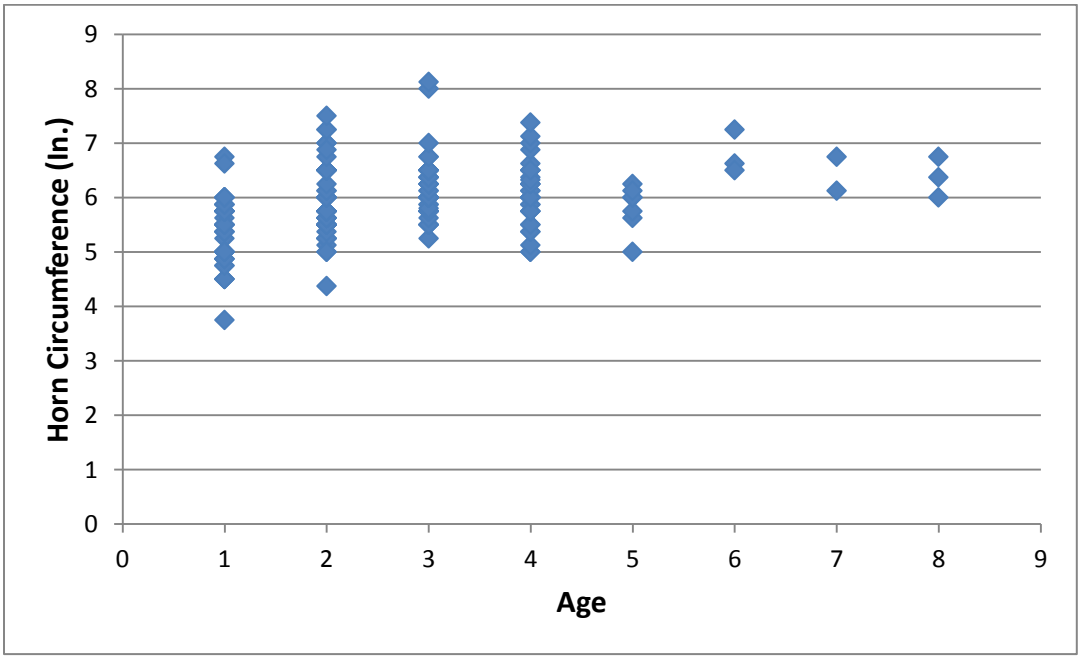


Figure 6. Horn circumferences by age of pronghorn bucks harvested in Kansas in 2009 and 2010.

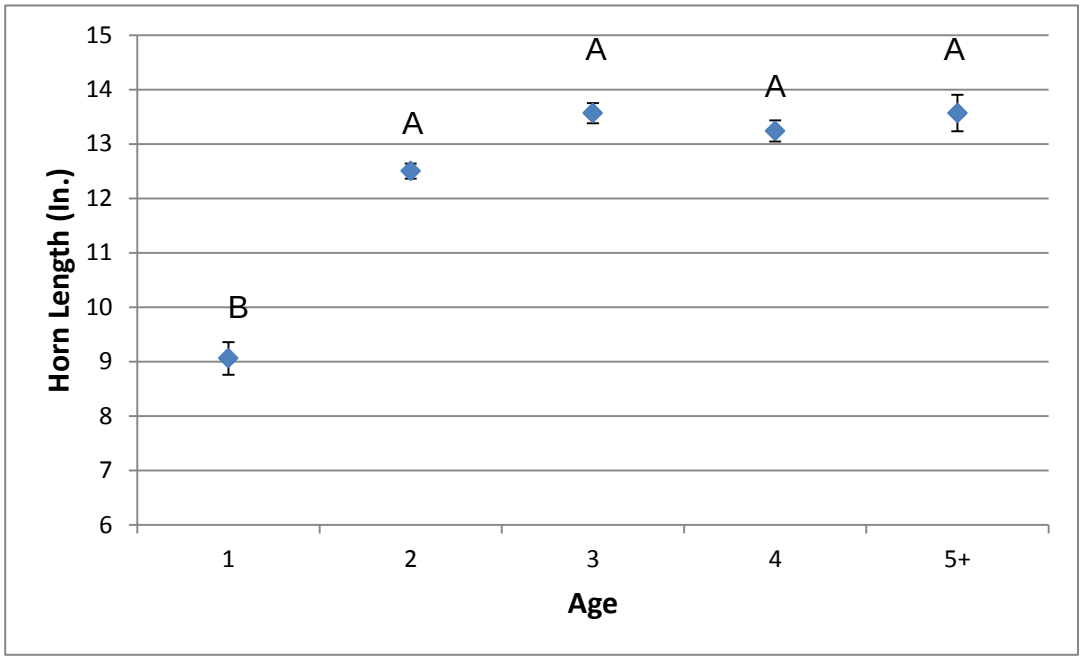


Figure 7. Mean horn length and SE by age of pronghorn bucks harvested in Kansas in 2009 and 2010. Significant differences in horn length between the ages are indicated by different letters above the SE bars ($P < 0.001$).

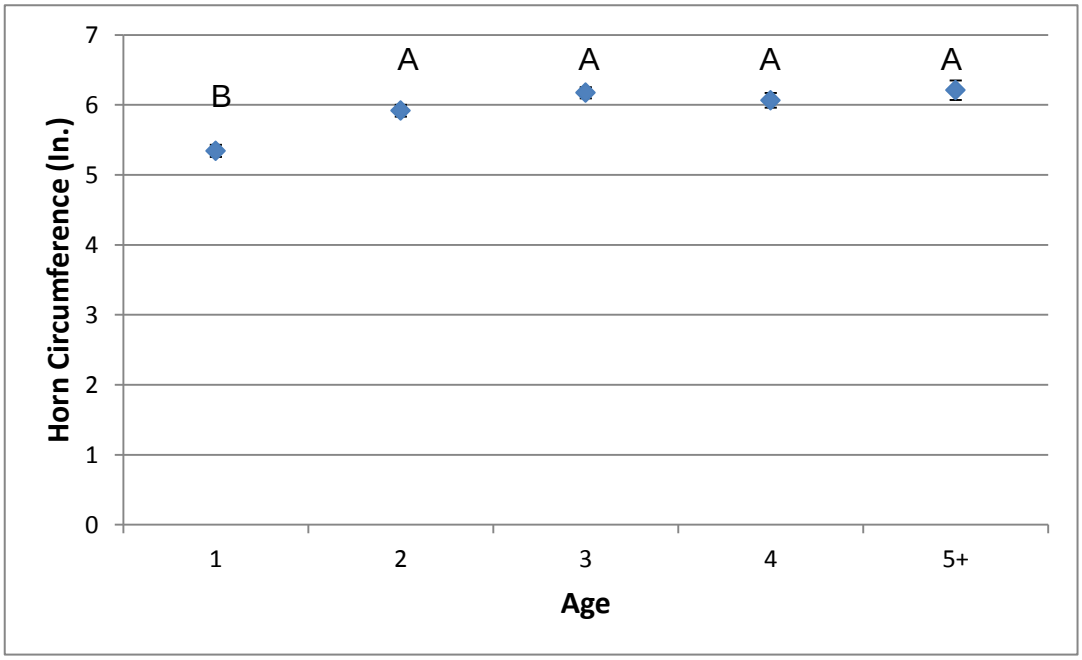


Figure 8. Mean horn circumference and SE by age of pronghorn bucks harvested in Kansas in 2009 and 2010. Significant differences in horn circumference between the ages are indicated by different letters above the SE bars ($P < 0.001$).

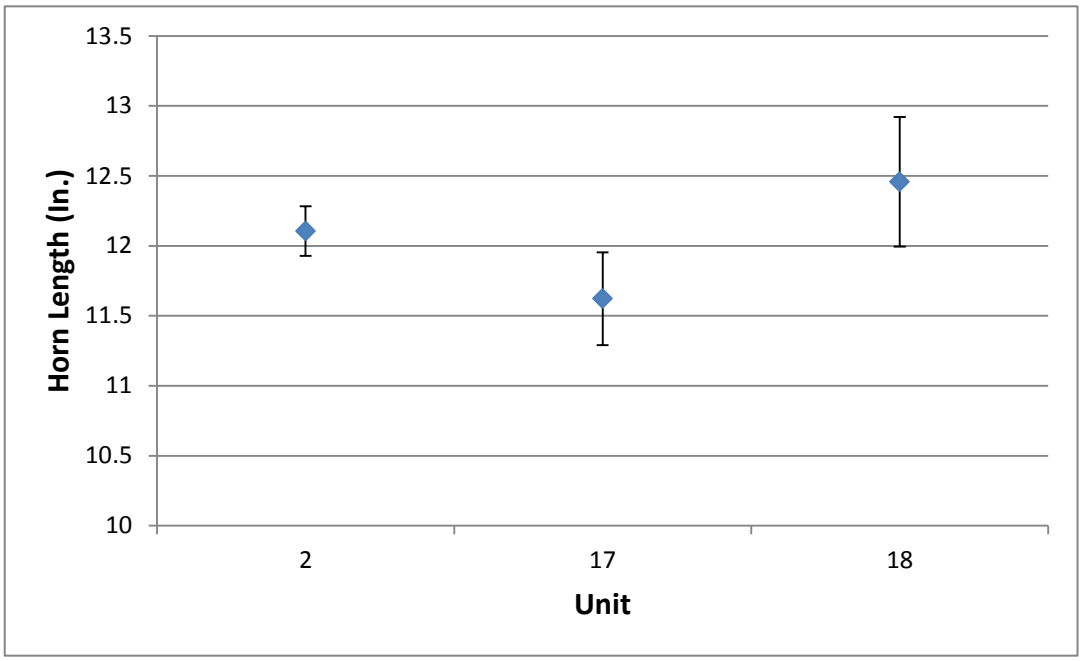


Figure 9. Mean horn length and SE of pronghorn bucks harvested in each of the 3 units open to hunting in Kansas in 2009 and 2010. There was no significant difference horn length between the 3 units (P = 0.136).

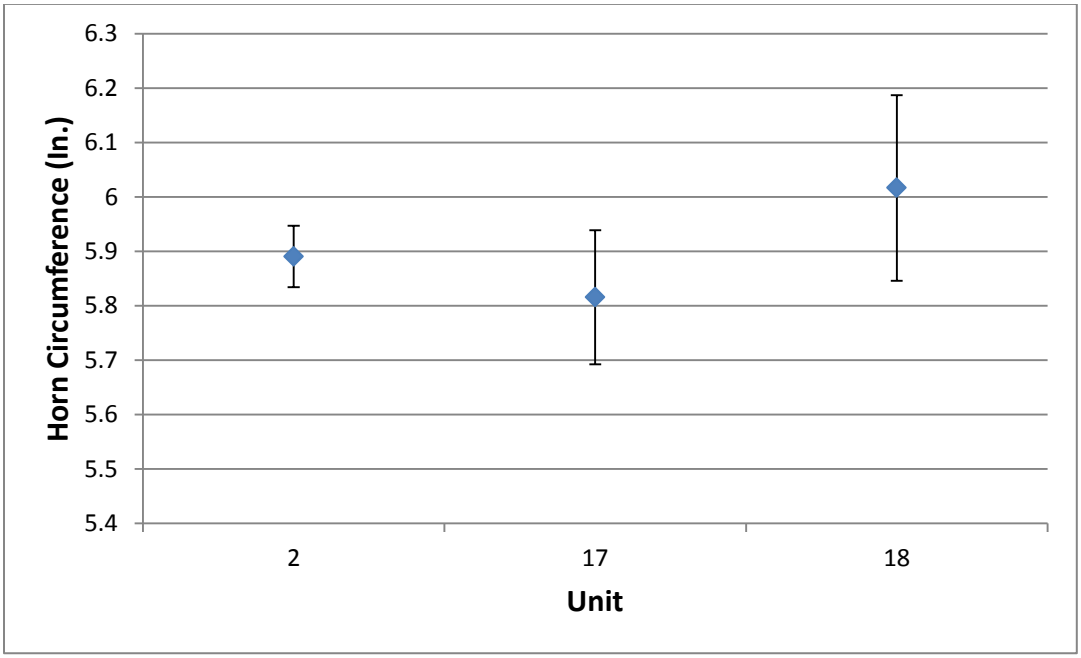


Figure 10. Mean horn circumference and SE of pronghorn bucks harvested in each of the 3 units open to hunting in Kansas in 2009 and 2010. There was no significant difference in horn circumference between the 3 units (P = 0.603).

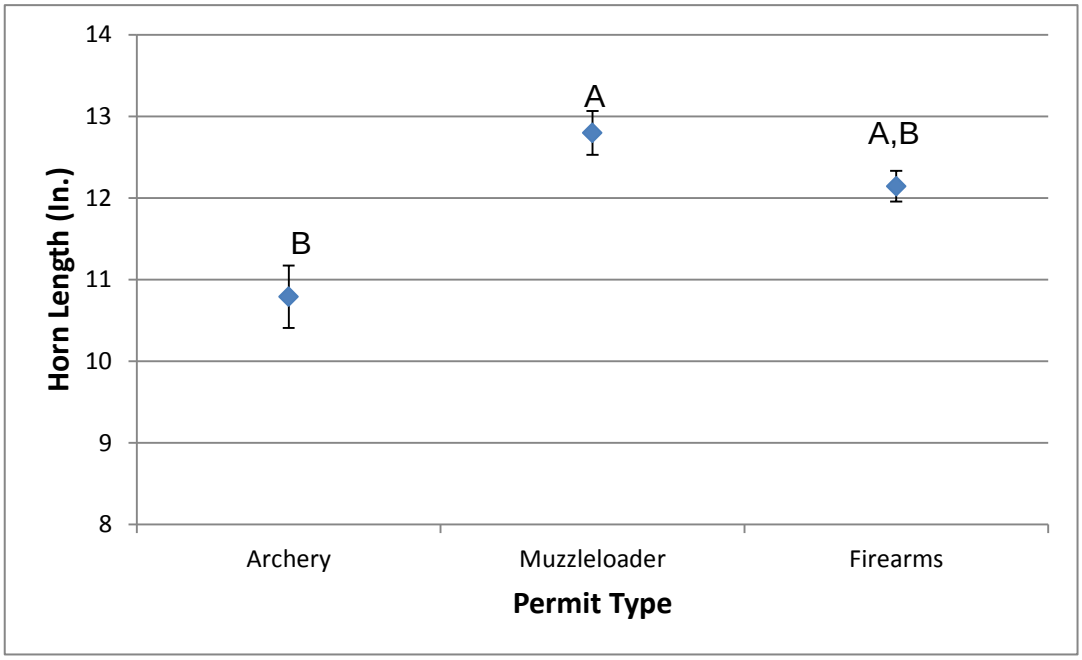


Figure 11. Mean horn length and SE of pronghorn bucks harvested by archery, muzzleloader, and firearms permit holders in Kansas in 2009 and 2010 . Significant differences in horn length between the permit types are indicated by different letters above the SE bars (P = 0.019).

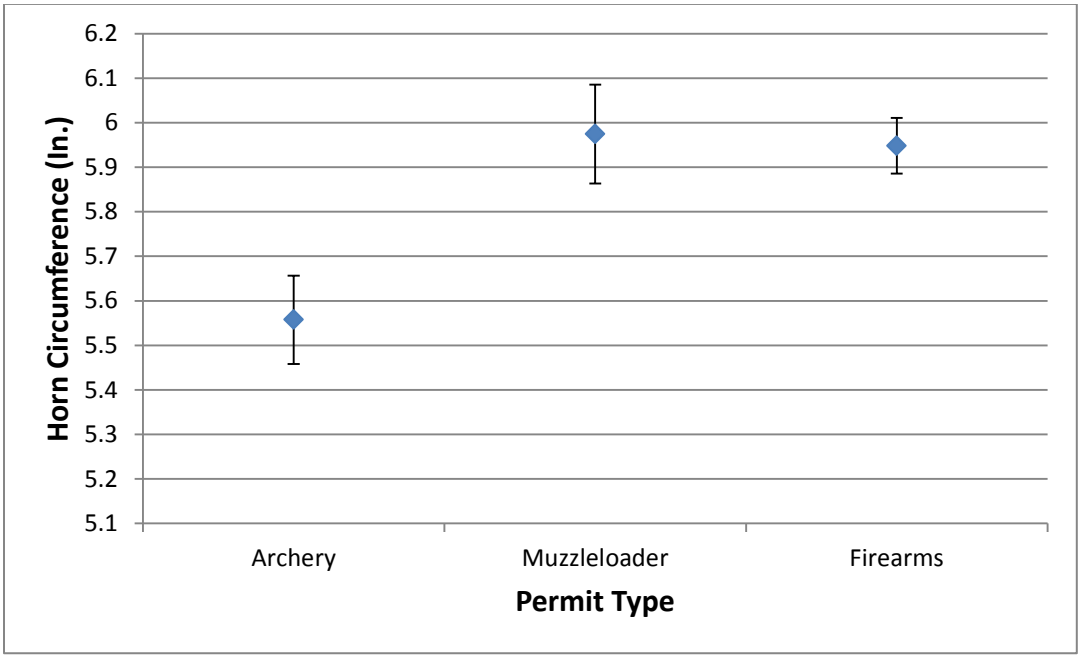
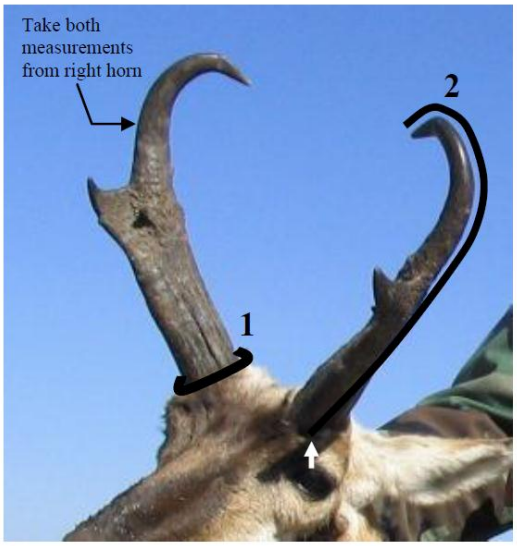


Figure 12. Mean horn circumference and SE of pronghorn bucks harvested by archery, muzzleloader, and firearms permit holders in Kansas in 2009 and 2010. There was no significant difference in horn circumference between the 3 equipment types (P = .0555).

Appendix 1. Portion of pronghorn harvest report requesting horn measurements from hunters.

Pronghorn Horn Measurements



Please take the 2 measurements described below. If you don't have a small tape measure, use a piece of string or wire to take the measurement, then use the ruler at the right to measure to the nearest 1/8th inch.

1. **Horn circumference at base:**_____
   - measure all the way around the base at the lowest possible point on horn.

2. **Horn length:**_____
   - measure along the outer edge of the horn from the center of the base just above the eye to the tip.

Note: We must also receive teeth for these horn measurements to be of value. (We are comparing age and horn size.) We may collect several years of data, but will eventually generate a report on this subject, which will be available to hunters. Thank you for participating in this project.

Pronghorn Management Units