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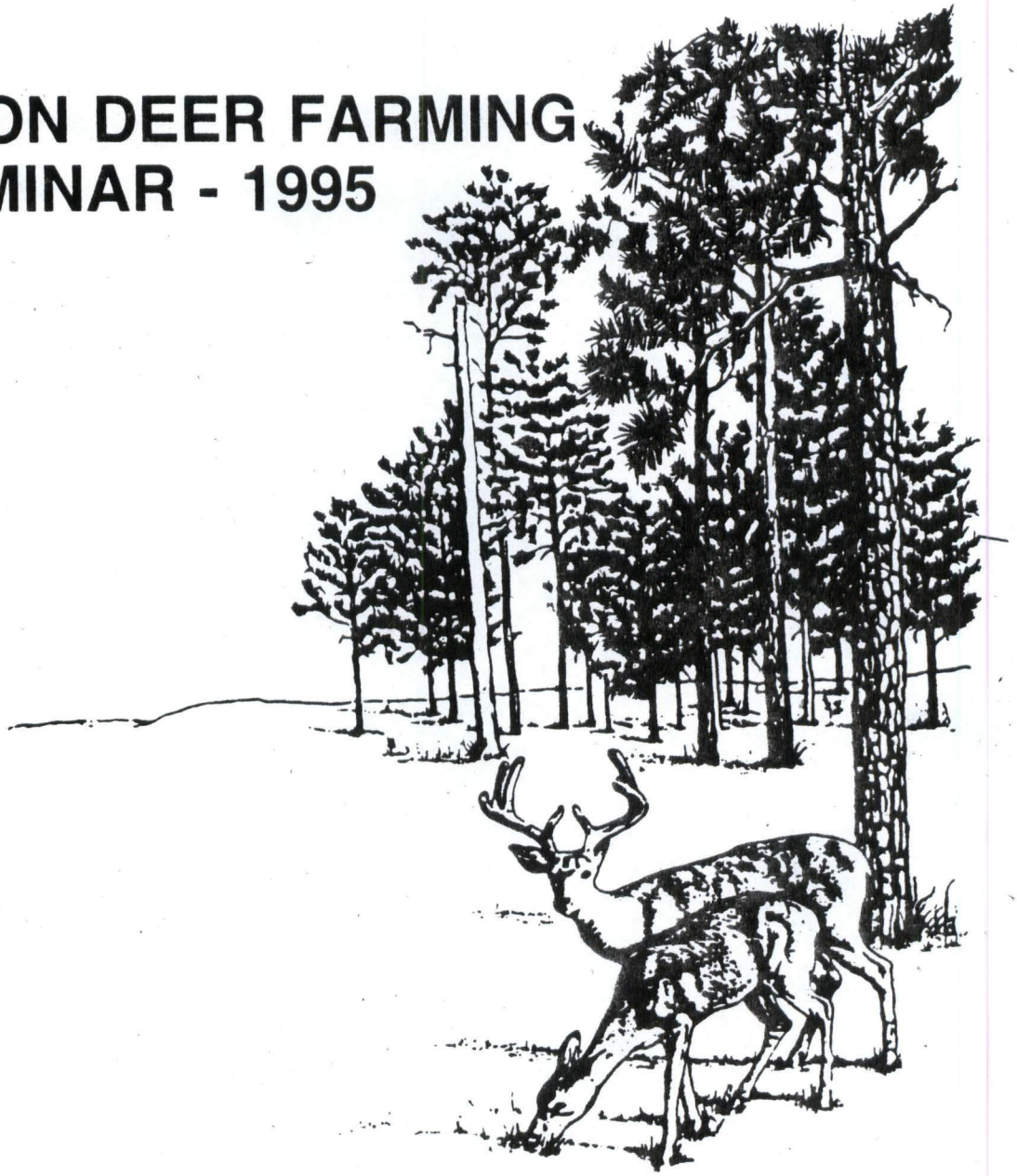

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SUPPLEMENTAL FORAGE MANAGEMENT FOR WHITE-TAILED DEER IN EAST TEXAS

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Background. The white-tailed deer is the most popular big game species in Texas. Our large deer population has generated a tremendous sport-hunting demand which has developed into an estimated four billion dollar a year industry. This demand has created an increased interest in deer management by landowners and resulted in the need for more intensive deer management strategies. Losses of deer habitat in East Texas due to increases in human populations, land use changes and urbanization have further increased the need for intensive management of the white-tailed deer. Increased food plot establishment has occurred in response to increased economic and recreational value of the white-tailed deer and the general decrease in a suitable habitat base due to urban expansion, highway and road construction, water development, cattle development strategies, even-aged timber management and clean farming methods. Supplemental plantings are becoming widely accepted throughout eastern Texas and much of the southeast; however, most plantings are not aimed at improving the nutritional plane of white-tails. This is especially critical since much of the southeastern deer range (including East Texas) provides substandard nutrition for desirable deer production. The use of supplemental food plots as an intensive management tool evolved from hunters' efforts to concentrate deer for harvest. In addition to concentrating deer for harvest, food plots can be utilized to increase the nutritional plane of white-tails and inject critical minerals (particularly calcium and phosphorus) into the diet of a deer herd. Maximum benefits from food plots can only be obtained if forages are available when native vegetation is lacking or low in nutritional value. In East Texas, these stress periods occur in late summer and late winter. Unfortunately, many well-meaning landowners and sportsmen waste thousands of dollars annually because of ill-fated attempts to establish food plots utilizing inappropriate varieties, inadequate sites, poor soil fertility, and/or poor planting techniques. In East Texas, food plots primarily of small grains (i.e. oats) for white-tailed deer were initially established as a means to increase deer harvest. Since these plantings were designed to concentrate deer during the hunting season, cool season legumes and small grains were the primary varieties utilized. More recently, use of warm season varieties has increased as landowners and sportsmen attempt to provide deer herds with high quality forage during the summer months when native vegetation quality is generally poor.

Current Information/Research Findings. East Texas is composed of two major

ecological regions: Post Oak Savannah and Pineywoods. The Post Oak Savannah lies northeast to southwest between the Blackland Prairies of central Texas and the Pineywoods in eastern Texas. The upland soils of East Texas are light-colored sandy loams and sands while bottomlands are typically light-brown to dark gray sandy loams, clay loams and some clays. Soils throughout East Texas are generally acid (pH below 7.0). Annual rainfall is generally the highest of any region in the state: 35 inches on the western edge of the region up to 55 inches along the eastern boundary. Abundant rainfall in the region is a mixed blessing when managing white-tail habitat. Abundant rainfall quickly leaches available nutrients in the soil and results in a decrease in forage quality. On the other hand, the amount of rainfall East Texas receives annually is generally sufficient to produce consistent crops of supplemental forages. Unfortunately, this high annual rainfall also results in the rapid succession of vegetation and leads to native food supplies that decrease in quality and grow beyond the reach of deer. For these reasons, supplemental forage management is a sound strategy that should be considered for East Texas white-tails. Well planned food plots increase forage availability and at least partially compensate for decreases in suitable deer habitat. The area selected for planting depends on the plant varieties to be established (warm vs. cool season) and the goals of the landowner/deer manager. Warm season varieties should always be located in bottomland soils because of their higher moisture retention potential during the rainfall deficient summer months. However, care should be taken to select a site that is not prone to flooding from nearby streams and rivers. Droughty upland soils are not good candidates for warm season variety establishment. Another factor that limits warm season forage production is native weed competition. Varieties that grow quickly and successfully compete with native weeds should be selected for planting. Cool season varieties are not as susceptible to rainfall deficient conditions or weed competition as warm season varieties. One exception may be the early fall months (September-October) if rainfall is deficient which may result in delayed planting of legumes. Regardless of whether warm or cool season supplemental forages are established, soil samples should be taken to determine lime and fertilizer requirements. Failure to properly amend the soil may result in drastically reduced variety performance, unsatisfactory yields, or excessive weed competition. If soil testing is not possible, food plots should be: (1) limed every three years at the rate of two tons per acre, (2) fertilized with 200 lbs. per acre of 6-24-24 (cool season plots) or 0-24-24 (warm season plots) following germination, and (3) cool season combinations of small grains should be top-dressed with 200 lbs. per acre of 34-0-0 fertilizer in mid-December. The site should be shredded and disked to prepare a clean seed bed. Agricultural limestone (if needed) should be applied prior to disking and worked into the soil.

Planting sites should be selected to minimize shading from nearby trees. However, to maximize utilization, sites should be selected adjacent to adequate escape cover. Since cool season plantings are often established in hunting areas, particular care should be given to establishing these plots near adequate escape cover, travel corridors and other habitat types frequented by deer. All legumes should be inoculated to increase nitrogen fixation. This will result in decreased fertilizer needs and increased soil quality over time. Planting depth is also critical for successful variety establishment. Failure to plant varieties (especially legumes) at the recommended depth may result in stand failure. Location of food plots depends on varieties to be established (i.e., warm vs. cool season) and availability of sites to develop into permanent food plots. As previously discussed, warm season forages should be established in bottomlands while cool season forages are suitable for establishment in upland or bottomland sites. Again, it is important to select sites that are not prone to flooding or standing in water due to heavy rains. Whenever possible, existing openings should be utilized for food plot development to reduce costs. Examples include fallow fields, pipeline and transmission line rights-of-way, logging roads, firelanes and interior road rights-of-way. Areas adjacent to public roads/access are poor planting sites since they may encourage poaching. The size and shape of supplemental food plots vary tremendously. However, numerous small plots are more effective at maximizing the edge available resulting in increased utilization by deer. Most plots are from 0.5 to 3.0 acres in size. Larger food plots can be established, especially if the shape is long and narrow instead of square. In addition, long narrow food plots maximize edge effect and serve to cut across an increased number of deer home ranges. However, plots must be wide enough to prevent excessive shading from nearby trees. Food plots should always be established adjacent to adequate escape cover. Plots established too far from escape cover may decrease utilization. Properly established food plots are expensive and this may limit the acreage that can be established. Therefore, it is important to maximize productivity and carefully select planting sites. A good rule of thumb is to plant 1%-3% of the habitat base present in both warm and cool season forages. For instance, 1-3 acres of food plots should be established for each 100 acres of habitat present. In addition, food plots should be distributed at the rate of at least one plot per 160 acres of habitat. Unfortunately, there is no one forage variety that can satisfy the nutritional requirements of the white-tailed deer throughout the year. As a result, warm and cool season forage combinations are recommended over establishment of individual varieties in order to maintain the availability of high quality forage throughout the year. Before establishing a supplemental forage variety or combination, four criteria should be utilized to determine if the forage will be suitable for establishments. The

forage should (1) increase the nutritional plane available, (2) be readily accepted, (3) be available at times when native forage is lacking in quality and quantity, and (4) be adapted to both the region (Post Oak Savannah or Pineywoods) and the site (bottomland or upland). In other words, if a forage variety does not improve nutrition, if deer won't eat it, if it's not available during periods of stress or it won't yield sufficient quantities to justify establishment, DON'T PLANT IT! If a forage or forage combination cannot satisfy all of these criteria, then it should not be considered for establishment. Warm season forages should be established in bottomlands to provide forage throughout the summer and early fall. Availability of high quality warm season forages is important since doe lactation, fawn growth and antler development all occur during the summer months. Alyceclover in combination with cowpeas has proven to be an excellent combination planting for increasing warm season forage. These combinations have also produced 3 to 4 tons of forage per acre in performance trials. Additional forage combination recommendations are given in Table 1.

Table 1. Warm season supplemental forage combinations recommended for East Texas whitetails.*

Species	Region	Site	Seeding rate (lbs/acre) broadcast**	Innoculation Req'd	Planting depth (inches)	Comments
Forage cowpeas	Post Oak or Pineywoods	Bottomland	40.0	Yes	1.0	Plant peas, then drag in alyceclover.
Alyceclover	Post Oak or Pineywoods	Bottomland	10.0	Yes	0.5	
Forage cowpeas	Pineywoods only	Bottomland	40.0	Yes	1.0	Plant peas, then drag in alyceclover.
Alyceclover	Pineywoods only	Bottomland	10.0	Yes	0.5	
American jointvetch	Pineywoods only	Bottomland	5.0	Yes	0.5	

* Plant varieties in combination between May 1 and June 15.
** Reduce seeding rate by 20% if a seed drill is used for planting.

Cool season combinations provide forage during the hunting season as well as during the critical stress period in January and February prior to spring green-up. Furthermore, cool season combinations can extend the season of forage availability into early summer, about the time warm season plots reach a growth stage suitable for utilization by a deer population. Elbon rye is an excellent cereal grain to include in a cool season forage combination because of its cold hardiness.

Additional grains that can be utilized to supplement elbon rye in a combination plot include oats and wheat; however, elbon rye should constitute at least two-thirds of the small grain component. Yucchi arrowleaf clover is a legume that has proven to be another valuable component of cool season forage plots. Arrowleaf clover provides forage through late spring and early summer. Once established, arrowleaf clover should not have to be replanted. An annual program of shredding in late summer followed by light disking or late summer burning of the clover will result in sufficient seed to develop stands the following year. Since the arrowleaf clover component of the stand requires slightly different management than the cereal grains, the clover should be planted in a strip adjacent to the small grains. Ryegrass will also reseed itself and may be established with the arrowleaf clover since it favorably responds to the same management strategy. Cool season forage combinations of small grains, arrowleaf clover and ryegrass have yielded as much as 4 to 5 tons of forage per acre per year. Additional cool season forage varieties that increase forage availability include subterranean clover, sweet clover, and Austrian winter peas. Subterranean clover and sweet clover produce best in the spring and early summer months. Austrian winter peas provide some early growth and may be established alone or in combination with cereal grains (Table 2). Whenever possible, livestock should be excluded from food plots established for white-tailed deer. Failure to exclude livestock may result in stand failure due to overbrowsing and result in limited forage availability for deer. Fence exclosures should have wire spacing that permit deer easy access to plots (i.e. bottom wire 18 inches from the ground).

Table 2. Cool season supplemental forage combinations recommended for East Texas white-tails.*

Species	Region	Site	Seeding rate (lbs/acre) broadcast**	Inoculation Req'd	Planting depth (inches)	Comments
Rye	Post Oak or Pineywoods	Upland or Bottomland	75.0	No	1.0	Combine and plant oats and rye. Combine and plant ryegrass and clover adjacent to small grains on well-drained soil.
Oats	Post Oak or Pineywoods	Upland or Bottomland	25.0	No	1.0	
Arrowleaf clover	Post Oak or Pineywoods	Upland or Bottomland	10.0	Yes	0.5	
Ryegrass	Post Oak or Pineywoods	Upland or Bottomland	10.0	No	0.5	
Rye	Post Oak or Pineywoods	Upland or Bottomland	60.0	No	1.0	Combine and plant rye, oats and wheat. Combine and plant ryegrass and clover adjacent to small grains on well-drained soils.
Oats	Post Oak or Pineywoods	Upland or Bottomland	10.0	No	1.0	
Wheat	Post Oak or Pineywoods	Upland or Bottomland	20.0	No	1.0	
Arrowleaf clover	Post Oak or Pineywoods	Upland or Bottomland	10.0	Yes	0.5	
Ryegrass	Post Oak or Pineywoods	Upland or Bottomland	10.0	No	0.5	
Sweet-clover	Post Oak or Pineywoods	Bottomland	20.0	Yes	0.5	Plant adjacent to other food plot components.
Subter-ranean clover	Pineywoods	Bottomland	20.0	Yes	0.5	Plant adjacent to other food plot components.
Austrian winter peas	Post Oak or Pineywoods	Upland or Bottomland	60.0	Yes	1.0	Plant adjacent to other food plot components or in combination with small grains. Reduce seeding rate by 50% if planted in combination with other forages.

* Planting dates for all varieties are 9/15 to 10/15, depending upon available soil moisture.
** Reduce seeding rate by 20% if a seed drill is used for planing.

Recommendations/Application. Supplemental forages are not cure-alls for poor deer management practices. Without proper habitat management and population control, food plot establishment is a waste to time and money for the hunter, landowner and deer manager. However, food plots can be an important piece of the overall deer management puzzle in East Texas. Properly established food plots can increase the production capacity of deer habitat by enhancing the nutritional plane of white-tails throughout the year.