Deer Summer Food Plot

Summary of 2021 Result Demonstration

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During the summer of 2021, the Polk County extension office conducted a result demonstration over whitetail deer summer food plots for Polk County and east Texas. This presentation reviews why summer food plots are important for deer management, results from the demonstration, and recommendations for landowners and wildlife managers.

Which season is hardest on deer?

To start the presentation, ask the audience which season do they think is the hardest on deer from both food availability and stress. Most of the audience will likely answer winter or possibly fall due to the lack of plants growing. However, for the forest of east Texas summer months can be the hardest time of the year for deer. When you look at the four seasons during spring, forbs, wildflowers, and other broad leaf plants that provide good nutrition are actively growing. During fall the mast (acorns and other nuts) crop fall from trees providing plentiful food. Plants are obviously not growing during the winter, however many of out spring forbs begin germinating during winter providing some browse. Summer months, especially July and August can be hard on deer because spring annual forbs have withered in the summer heat and the fall mast crop has yet to drop. This means the majority of browse available is form woody trees and many of east Texas tree species are ranked as low-quality browse especially in a pine plantation.

Benefits

- Provide supplemental nutrition during summer (June-Aug.)
- Lactating does
- Fawn development
- Antler development
- Increased benefit during drought years

The main benefit of summer food plots is providing high quality browse during the summer months. In addition, during summer deer experience stress form does lactating, fawns growing, and bucks developing antlers. Summer food plots provide supplemental nutrition during this time. During drought years this benefit increases as native browse dries up. However, the downside of summer food plots is they also need adequate rainfall and if your native browse is struggling from lack of rain your food plot will be also unless irrigation is provided which is not common in east Texas.

Summer Food Plot Considerations

- Site selection
- Smaller vs large
- 1-3% of land
- Planting date
- Species selection

There are several factors you need to consider when planning your summer food plots. For summer food plots, bottom sites with deep soils or preferred over hill sides with sandy soils that will have lower soil moisture. This is to mitigate decreased rainfall during the summer months. An ideal summer food plot site would be along a creek or small stream valley with deep loamy soils. Ask the audience if a large or small food plot is preferred. Many will answer large as you would think a bigger food plot is better. However, eventually a food plot can get too large to where deer utilization decreases towards the middle. Deer require cover to escape form predators and will utilize a food plot that is small and narrow over one that is wide with cover being a few hundred yards from the middle. A general rule of thumb is to plant 1-3% of your land in food plots. So, if you have 100 acres of land you should plant 1-3 acres of food plots. I would recommend on 100 acres to plant three 1 acre food plots over one 3 acre food plot. For summer food plots memorial day is a good target planting date with anytime between May 1 and June 30 being acceptable. An ideal food plot plant species would produce a large yield and will also be preferred browse by deer. In other words, we don't want a plant that has a large yield but is not browsed or a plant that is preferred by deer but is low yielding.

Timeline

- April=Soil test, order seed
- May=Prepare seed feed
- May=Add Fertilizer
- May-June= Plant seed

An approximate timeline for summer food plots in Polk County. Conduct a soil test no later then April to determine what nutrients are in the soil so you can apply the right type and amount of fertilizer. I recommend contacting your feed store a month or two before you want to plant to ensure they have your seeds in stock when you are ready to plant. Some year seeds can be in short supply. Seed beds should be prepared by applying herbicide for a chemical burn if necessary, followed by tillage work 2-3 weeks before planting. Fertilizer can be applied at or right before planting. A broadcast spreader or grain drill can be used to plant the seed. If using a broadcast spreader lightly drag the soil after spreading the seeds to achieve good seed to soil contact. Again, memorial day is a good target planting date.

Why conduct a result demonstration?

- Lack of use of summer food plots
- Lack of "East Texas" specific species
- Determine species productivity
- Determine deer preference
- Compile recommendation for land managers

When conducting site visits many landowners ask what can be done on my property to improve my deer herd. As landowners in Polk County there are many tools that can be used such as harvest plans based off deer surveys, habitat management, and providing supplemental food sources. Many landowners utilize winter food plots but not summer food plots and while conducting site visits it becomes evident that many landowners don't comprehend the importance and benefits of summer food plots. This result demonstration was developed to help make landowners aware of the importance and benefits of summer food plots. There is also a lack of research and data that I could find on summer food plots and species recommendations for east Texas. Most of the research and species recommendations has occurred in other southern states and that information may not be valid for east Texas. This demonstration allowed us to test species commonly planted in summer food plots across the south and see how they respond to the growing conditions in east Texas. Five species were selected for the demonstration and measurements taken during the demonstration helped to determine which species were high yielding or high productivity and which species the deer preferred. An ideal food plot species would be high yielding and be preferred by deer. A high yielding plant is useless if it is not preferred by deer and on the flip side a plant that is preferred by deer but is low yielding is also not a good option for food plots. Lastly this demonstration allows the extension office to develop recommendations specific for Polk County for local landowners.

Site selection and prep

- Hidden Valley Rd. Livingston
- Bottomland site
- Conducted soil test
- Sprayed Glyphosate 3 weeks prior to planting
- Applied 18-24-26, K-Mag, and pelleted Ag lime at time of planting to fulfill soil fertility requirements
- After applying fertilizer disced ground, spread seed by hand, and then lightly disced

A bottomland site next to a small intermittent stream was selected due to its deeper soils and was already cleared. A soil test was conducted in February. 3 weeks prior to planting glyphosate was applied to allow for a chemical burn and reduce weed competition. Fertilizer was then applied at planting at rates to fulfill soil fertility requirements. K-Mag, which is a good source of potassium and magnesium was applied since the soil was needing large quantities of these nutrients. Lime was applied to help raise soil pH. The ground was then disced to incorporate the fertilizer and to prepare the seed bed. Hand broadcast spreader was used to spread the seed and then afterwards the soil was lightly disced to help cover the seeds and provide for good seed to soil contact. The disc was only allowed to scratch the soil surface.

Pictures of the result demonstration site and a volunteer discing the soil. As you can see the site has good soils, surrounded by woods, and has full sunlight for majority of the site.

Plots

Plot size: 20'x40', 800 sq. ft.
Plot 1: Brown Top Millet, 18 lbs. per acre
Plot 2: Korean Lespedaza, 36 lbs. per acre
Plot 3: Iron Clay Cowpeas, 135 lbs. per acre
Plot 4: Sorghum Sudangrass, 72 lbs. per acre
Plot 5: Lab Lab, 44 lbs. per acre
Plot 6: Sorghum Sudangrass, 72 lbs. per acre
Plot 7: Lab Lab, 44 lbs. per acre
Plot 8: Brown Top Millet, 18 lbs. per acre
Plot 9: Iron Clay Cowpeas, 135 lbs. per acre
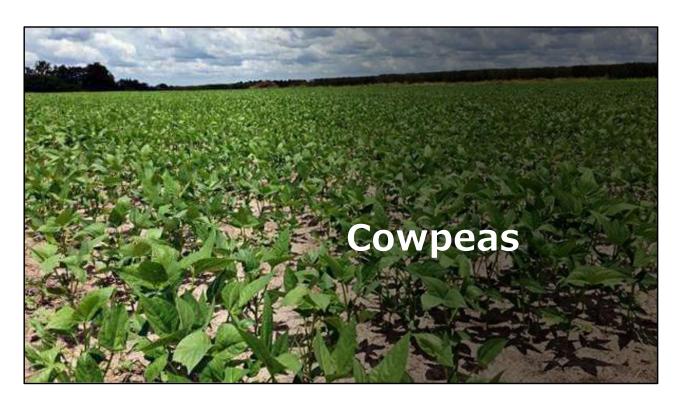Plot 10: Korean Lespedaza, 36 lbs. per acre

10 plots were marked on the site, so each species had 2 plots. The plots were approximately 800 sq. ft. and the species were randomly selected to each plot. Seeding rates were taken from seed manufacture recommended seeding rates. Lbs. per acre rate was reduced to match seeding rate for 800 sq. ft. The next five slides show pictures of the species planted.

Millet

Millet is a fast growing summer annual that is used for a variety of purposes such as silage for cattle and the seed as a food source for upland game birds. Millet is a commonly recommended for summer food plots.

Lespedeza

Lespedeza is a warm season annual herbaceous legume that is fine stemmed. Korean lespedeza is commonly planted in food plots and in pastures in the mid-west and eastern United States.
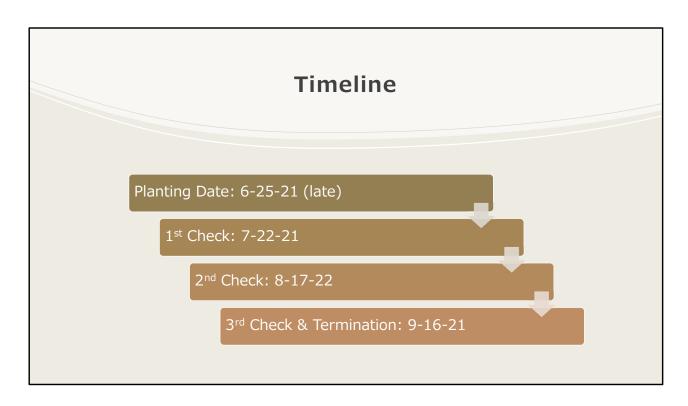
Cowpeas

Cowpeas are another warm season annual legume and are probably the most widely planted species in southern food plots.

Sudan Sorghum (hay grazer)

Sudan sorghum is a cross between sudan grass and sorghum grown for seed. Sudan sorghum is also commonly called hay grazer and is planted as a summer annual forage source for cattle and hay production.

Lab Lab

Lab lab is another warm season annual legume. This tropical legume has a vining growth structure and is considered an excellent browse plant for summer food plots.

Timeline

Planting Date: 6-25-21 (late)

1st Check: 7-22-21

2nd Check: 8-17-22

3rd Check & Termination: 9-16-21

All five species were planted on June 25. The plan was to plant the week prior to memorial day weekend, but due to excessive rainfall the site was to muddy for the tractor until the last week of June. The demonstration lasted for three months and once a month measurements were taken during checks to record production and deer preference.

Calculation of growth and preference

- "Deer proof" woven wire cages (3 feet in diameter)
- During each check average height was measured inside and outside of cage
- 3rd check dry matter weight was recorded (clipped vegetation)
- Utilization: inches vs weight
- Cow pea data invalid due to failure of deer proof cages

Deer proof woven wire cages were placed in the middle of each plot to exclude deer from a circle that was 3 feet in diameter. During each monthly check average height was measured inside the cage and outside of the cage for each plot. At the termination of the demonstration all forage was clipped within the wire cages and a random 3 foot diameter circle outside of the wire cages. This allowed us to take multiple measurements to help determine species productivity and deer preference. Utilization by deer was both measured in inches and weight. Cowpea data was invalid due to the failure of wire cages within the cowpea plots. The deer were so determined to browse the cowpeas within the cages they literally moved the cages around and browsed all but one cowpea in the wire cages. Even though the data is invalid I think the determination of deer to browse the cowpeas show their preference for cowpeas over all the other species planted.

Picture of the summer food plot after planting. Wire proof cages can be seen that are 3 feet in diameter. Because a t-post was only put on one side of the cages deer move the wire around in the cowpea plots. You can also see our gracious landowner, Ms. Frida, volunteering her time and money to help with the result demonstration.

1st check

Species	7/22/2021			
	Inside Cage Height (in.)	Outside Cage Height (in.)	Difference (in.)	Difference (%)
Millet	26	6	20	77%
Lespedaza	4	2	2	50%
Cowpeas	15	8	7	47%
Sudan	30	15	15	50%
Lab Lab	22	22	0	0%
Sudan	23	12	11	48%
Lab Lab	25	23	2	8%
Millet	30	5	25	83%
Cowpeas	14	7	7	50%
Lespedaza	3	3	0	0%

7/22/2021			
	Inches		%
Millet	25	Millet	83%
Millet	20	Millet	77%
Sudan	15	Lespedaza	50%
Sudan	11	Sudan	50%
Cowpeas	7	Cowpeas	50%
Cowpeas	7	Sudan	48%
Lespedaza	2	Cowpeas	47%
Lab Lab	2	Lab Lab	8%
Lab Lab	0	Lab Lab	0%
Lespedaza	0	Lespedaza	0%

Data from the 1st monthly check in July. The graph on the left is the data from each plot. As you can see, we measured inside the cages and outside the cages in inches. From that data we can calculate total inches browsed by deer and percentage. The graph on the right ranks each plot from greatest utilization for both difference in inches and difference in percentage. Greatest utilization is from top to bottom. At the first check both millet plots had greatest utilization in both inches and percentage. One lespedeza plot had no utilization while the other plot had half of the lespedeza browsed even though it was only 2 inches. Lab lab was basically not utilized by deer during the first month. At this point the cowpea data is valid as deer had not browsed the cowpeas within the wire cages. Approximately half of the sudan sorghum was browsed during the first month. The following pictures were taken during the first check.

Millet is the plot on the left and you can see the considerable utilization of millet by deer outside of the wire cage. The picture on the right is lespedeza as you can see it was slow growing and after a month was only a few inches tall.

These pictures are from a cowpea plot with the left from outside the wire cage and the right from inside the wire cage.

Picture of a cowpea plot. As you can see just like the millet deer have browsed the cowpeas heavily during the first month. Every plant outside of the wire cage had several browse points and many were just stems with a couple leaves.

The picture on the left is a sudan sorghum plot. As you can see the sudan sorghum outside the plot is about half the size of the plants within the cage. When the sudan sorghum first germinated the deer browsed on it heavily but browsing begin to decrease around 1 month into the demonstration. The picture on the right is a lab lab plot showing minimal browse by deer.

2ⁿᵈ Check

| Species | 8/17/2021 | | | |
	Inside Cage Height (in.)	Outside Cage Height (in.)	Difference (in.)	Difference (%)
Millet	48	7	41	85%
Lespedaza	9	0	9	100%
Cowpeas	0	6	-6	0%
Sudan	83	50	33	40%
Lab Lab	60	21	39	65%
Sudan	65	44	21	32%
Lab Lab	62	37	25	40%
Millet	51	5	46	90%
Cowpeas	12	8	4	33%
Lespedaza	8	3	5	63%

8/17/2021			
	Inches		%
Millet	46	Lespedaza	100%
Millet	41	Millet	90%
Lab Lab	39	Millet	85%
Sudan	33	Lab Lab	65%
Lab Lab	25	Lespedaza	63%
Sudan	17	Lab Lab	40%
Lespedaza	9	Sudan	40%
Lespedaza	5	Cowpeas	33%
Cowpeas	4	Sudan	32%
Cowpeas	-6	Cowpeas	0%

Data from the second monthly check. Though lespedeza only showed little difference in height you can see the deer were browsing the lespedeza. Millet continued to be browsed but by the second month millet begin to produce a seed head and deer begin to stop browsing on millet. The deer begin to browse on the lab lab during the second month. By the second month browsing was minimal or absent on the sudan sorghum. Again, you can see how the cowpea data is invalid as they browsed all the cowpeas inside the wire cages in one of the plots.

Millet plot. At this point you can see the millet begin producing a seedhead and browsing basically ceased. This is likely due to the plant becoming less palatable to other more palatable species like lab lab.

Lespedeza outside the wire cage on the left and inside the wire cage on the right. Lespedezas was extremely low yielding throughout the first 2 months, but the deer were finding and browsing it.

By 2 months the deer had basically browsed the cowpeas to death. As you can see the plants were nothing but stems and the picture on the right shows a wire cage where the deer were able to browse the cowpeas within the cages.

Sudan sorghum on the left. You can see the cage is hidden showing the high yielding potential of sundan sorghum. As this point the deer were not browsing the sudan sorghum and the difference in height from inside and outside the cages were from browsing activity during the first month. Lab lab plot on the right. During the second month deer begin to browse the lab lab.

Close up of lab lab inside the cage on the left and outside the cage on the right showing browsing activity. It was interesting that even though the deer could easily browse the lab lab growing over the top of the cage they did not throughout the demonstation. But for the cowpeas the deer literally moved the cages. I think this demonstrates deer preference for cowpeas over any other species planted.

3ʳᵈ Check

Species	9/16/2021			
	Inside Cage Height (in.)	Outside Cage Height (in.)	Difference (in.)	Difference (%)
Millet	43	8	35	81%
Lespedaza	4	2	2	50%
Cowpeas	0	0	0	0%
Sudan	96	75	21	22%
Lab Lab	51	21	30	59%
Sudan	101	74	27	27%
Lab Lab	62	29	33	53%
Millet	50	12	38	76%
Cowpeas	24	0	24	100%
Lespedaza	7	2	5	71%

9/16/2021			
	Inches		%
Millet	38	Cowpeas	100%
Millet	35	Millet	81%
Lab Lab	33	Millet	76%
Lab Lab	30	Lespedaza	71%
Sudan	27	Lab Lab	59%
Cowpeas	24	Lab Lab	53%
Sudan	21	Lespedaza	50%
Lespedaza	5	Sudan	27%
Lespedaza	2	Sudan	22%
Cowpeas	0	Cowpeas	0%

Data from the 3ʳᵈ and final monthly check. Again, cowpea data is invalid. The 100% utilization from the one cowpea plot was because only one cowpea survived the entire demonstration. Millet counties to show high utilization but that is still from the first month of the demonstration. During the 3ʳᵈ month of the demonstration lab lab was the preferred species. Sudan sorghum was not being browsed and lespedeza was still being browsed but was producing very little yield.

By the third month millet was not being browsed and as you can see the plants had reached maturity and was not very palatable.

Lespedeza continues to be low yielding, but deer are finding it to browse even within the weeds that had become established by the 3rd month.

One Plant Survived!

The one cowpea out of the hundreds that had germinated that had survived to the end of the demonstration.

Sundan sorghum from outside the cage on the left of the tape and from inside the cage on the right of the tape. There is about a two foot difference and this is from browsing during the first month of the demonstration. Deer stooped browsing sudan sorghum once the plants reached approximately 24 inches in height.

Lab lab plot showing heavy utilization on the left picture.

Species	Overall	
	Difference (in.)	Difference (%)
Millet	96	244%
Lespedaza	13	200%
Cowpeas	1	47%
Sudan	69	112%
Lab Lab	69	124%
Sudan	59	107%
Lab Lab	60	102%
Millet	109	250%
Cowpeas	35	183%
Lespedaza	10	134%

	Inches		%
Millet	109	Millet	250%
Millet	96	Millet	244%
Sudan	69	Lespedaza	200%
Lab Lab	69	Cowpeas	183%
Lab Lab	60	Lespedaza	134%
Sudan	59	Lab Lab	124%
Cowpeas	35	Sudan	112%
Lespedaza	13	Sudan	107%
Lespedaza	10	Lab Lab	102%
Cowpeas	1	Cowpeas	47%

These graphs show overall utilization. Difference in inches and percentage for each monthly check was added together to provide overall utilization for all three months.

9/16/2021				
Species	Inside Cage Dried Weight (oz)	Outside Cage Dried Weight (oz)	Difference (oz)	Difference (%)
Millet	8.875	1.125	7.75	87%
Lespedaza	0.125	0.062	0.063	50%
Cowpeas	0	0	0	0%
Sudan	38.625	27	11.625	30%
Lab Lab	7.125	0.093	7.032	99%
Sudan	29.625	19.375	10.25	35%
Lab Lab	9.625	0.093	9.532	99%
Millet	12.5	1.125	11.375	91%
Cowpeas	2.125	0	2.125	100%
Lespedaza	0.093	0.062	0.031	33%

	OZ.		OZ. %
Sudan	11.625	Cowpeas	100%
Millet	11.375	Lab Lab	99%
Sudan	10.25	Lab Lab	99%
Lab Lab	9.532	Millet	91%
Millet	7.75	Millet	87%
Lab Lab	7.032	Lespedaza	50%
Cowpeas	2.125	Sudan	35%
Lespedaza	0.063	Lespedaza	33%
Lespedaza	0.031	Sudan	30%
Cowpeas	0	Cowpeas	0%

At the termination of the demonstration after 3 months all standing vegetation was clipped inside the 3 foot diameter wire cages and in a random 3 foot diameter circle outside of the cages. This clippings were then allowed to dry for several weeks and then weighed. These graphs show those results. Weight helps to demonstrate overall production (yield) and how much of that plant was browsed by weight. As expected sudan sorghum produced high yields but was not heavily browsed. Millet produced high yields and was heavily browsed. Lab lab produced moderate yields and was browsed heavily. Lespedaza produced extremely low yields and cowpea data was again invalid.

Weighted Score Utilization Summary

Millet	176
Lab Lab	114
Sudan	107
Lespedaza	88
Cowpeas	*75*

A weighted utilization score was calculated to help interpret the results. Each plot was given a score of 10 if it ranked the highest in each category and 1 if it ranked the lowest in each category. There was 10 categories: difference in inches for each monthly check, difference in percentage for each monthly check, overall difference in inches, overall difference in percentage, difference in ounces, and difference in ounces in percentage. Each plot score for each category was then added together. The two plots for each species were then added together for a weighted score utilization summary. If a species ranked as the highest and second highest utilization in each category it would receive a score of 190. If a plot ranked the lowest and second lowest in each category it would receive a score of 30.

Conclusion

- Millet was utilized heavily during the first two months and then stopped once maturity was reached

- Lespedeza was browsed regularly during the demonstration but lacked in production of available browse

- When looking at % of lespedeza browsed it was middle of the road

The last few slides review what was learned during the demonstration both from visual observation and from the data collected. Majority of millet was browsed during the first month and browsing activity ceased by two months when the plants reached maturity and became less palatable. Deer did show preference for lespedeza but was just not a good species due to its lack of production.

Conclusion

- Cowpeas were heavily preferred by deer, lacks data
- Cowpeas never got a chance to become established
- Sudan was browsed heavily during the first 30 days
- Little to no browse occurred in Sudan after plants reached 24 inches in height
- Deer showed little preference to lab lab until 2 months
- During final month of the demonstration lab lab was preferred

Cowpea data is lacking due to the failure of the wire cages, however because the deer were determined to eat the cowpeas within the cages and browsed all but one cowpea to the ground I think these factors demonstrate deer preference for cowpeas over any other species planted. Sudan sorghum was browsed for only the first few weeks and after the plants reached 24 inches in height browsing stopped. Lal lab was untouched by deer until the second month and by the 3rd month it was the preferred browse species. This is probably since all the other species were less palatable by this point or were not high yielding.

Conclusion

- Nearly 100% of all standing vegetation was browsed for cowpeas, lab lab, and millet
- Deer preference varied throughout growth period
- Cowpeas→ millet/ lab lab → sudan → lespedeza
- Recommend a mix of species for your food plot

By the termination of the demonstration nearly 100% of all cowpeas, lab lab ,and millet were browsed. Showing that all three of these species are preferred by deer and would be suitable for summer food plots. Deer preference varied throughout the three months and for this reason you should plant multiple species in a summer food plot to provide quality browse throughout the summer months. Based off visual observation and data collected I would select cowpeas as being most preferred species for summer food plots in Polk County followed by millet or lab lab. Sudan sorghum and lespedeza round out the bottom two species with lespedeza being least preferred due to its lack of production. The key takeaway from the demonstration is a mixture of species should be planted in summer food plots to take into consideration that different species grow at different rates, reach maturity at different times, and deer preference varies based off plant maturity and stage of growth.

Conclusion

- Cowpeas 30%
- Millet 30%
- Lab Lab 25%
- Sudan 10%
- Lespedaza 5%

Recommended seeding mixture for Polk County summer food plots would be as followed. Cowpeas and millet would each make up 30% of the mix due to deer preference for cowpeas and preference and production for millet. Lab lab would make up 25% of the mix as it is preferred by deer after a couple months of growth. Sudan sorghum would be included at 10% as deer browse it during the first month of growth. More then 10% in your seed mix is not required due to its high production potential. Lastly, lespedeza would make up 5% of the seed mix because of low yield potential.

Questions

Would like to thank Ms. Frida for allowing the extension office to utilize her property for the result demonstration.