



PRACTICAL WILDLIFE MANAGEMENT INFORMATION

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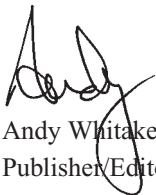


Earl Says...

I had an interesting conversation a few weeks ago with a friend of mine who is a self-described semi-anti hunter. She's not really opposed to hunting if the hunter consumes the meat from an animal he kills, although she has no desire to do it herself. But she couldn't understand why we hunters enjoy our sport as much as we do. I decided to try some logic to illustrate why hunting is important for herd management and conservation.

Now I don't usually feel the need to explain myself to folks who don't hunt or are against any form of hunting. Let's face it, anti-hunters have their minds made up and there's nothing you or I can say to make a difference with them. But I've always heard that about 20% of the population is very much for hunting while about 20% of folks are vehemently against all hunting. The rest of the world are the people we, as hunters and conservationists, need to educate about hunting and wildlife management. When it comes to local, state and federal referendums on these matters, it's this "silent majority" of people who don't care one way or the other that makes the difference in the final vote.

I was able to meet on common ground with my non-hunting friend by explaining in detail how hunters are the original conservationists and how we pay our own way while pursuing our passions. I believe it's important to stand up for your beliefs, but sometimes it's better to hit someone over the head with a feather rather than a hammer.



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The Power of the Pea: Legumes and Their Importance in a Wildlife Management Program

By Ryan Shurette

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When applying basic wildlife habitat management principles, three elementary components are generally considered to be most essential. These are of course **food**, **water**, and **cover**. In the East, water is usually not an issue and it can be dismissed from the list of limiting factors in most situations. However, food and cover will almost always make the difference between abundant wildlife populations and a biological desert, regardless of the region. Cover will most often be provided by some form of vegetation. Likewise, since most game species are herbivorous (or insectivorous), food will also largely be dictated by the vegetation and community of plants in an animal's environment. In this article, we will be focusing on food plants, and more specifically on one very important family of food plants; the pea. When I simply say "pea", I realize it may be difficult to get excited at first over this little 3-letter word. For some folks, cultivated cowpeas which are commonly planted in

*The seeds of native lespedezas are probably the most important for bobwhites out of all other native plants.
(Photo credit H. Zell)*

the warm season for white-tailed deer may come to mind, or perhaps the yellow flowers of partridge peas, which are so popular with managers for northern bobwhite quail. While these two plants are useful and desirable in many situations, there is so much more to the world of peas than that. And for wildlife species like the aforementioned whitetail deer and bobwhite, the pea family is extremely important in regards to its contribution to high quality nutrition, in the form of foliage and seeds.

Everyone knows the story of *Jack and the Beanstalk*. In the classic children's legend, a few bean seeds opened the door to a whole new world; a world of giants. There seems to be some analogy in this tall tale with regards to real world wildlife management. The **Fabaceae** family (otherwise known as the legume, pea, or bean family) is in fact extremely important and immensely diverse. The family includes not only annual, biennial, and perennial herbaceous plants, but also shrubs, trees, and vines. Actually, it is the third largest family of plants (with regards to numbers of species) in the world, with over 19,000 species known to date. Only the orchid and aster families are known to have more species. The general characteristics of this family include an inde-

terminate flower and the characteristic "pea pod" fruit, technically called a "legume". The "pea" is actually the seed inside the fleshy tissues and pod which collectively comprise the fruit. Most legumes are also nitrogen fixers and can effectively add nitrogen back into the soil.

This family is also obviously extremely important to humans, with regards to history, culture, economy, and sustenance. Beans, peas, and various other legumes have been staple diets of many peoples throughout history largely because the foliage, the fruits, and the seeds are typically very high in protein. Most vegetarians are well-aware of this fact and therefore commonly use legumes to supplement the protein levels in their diets. For example, cooked black-eyed peas contain about 11 grams of protein per cup, kidney beans have about 13 grams, and lentils have about 18 grams. Although they are less popular, cooked soybeans are reported to have 29 grams of protein per cup! This high protein content generally holds true for both the seeds and the foliage. The leaves of many legumes for example may consist of 30% crude protein. For wildlife species, other characteristics besides protein content (like oil content, insect production, cover

value) are also important factors, but simply by considering the nutrition legumes provide, it is easy to see why many species often prefer them.

In the mainland US there are legumes that are adapted to swamps, ponds, bogs, shaded bottomlands, mountain balds, mesic slopes, as well as dry fire-maintained ridges and uplands. Pretty much every natural community you could name will host a sundry suite of species in the legume family. However, here we will focus mainly on the legumes associated with the soils, topography and habitats found in and around uplands, since this is typically where active management (such as



Besides providing seeds for bobwhites, essentially all of the native lespedezas are also preferred deer forages. (Photo credit Ted Bodner and James Miller, Bugwood)

planting, disking, thinning, and burning) occurs. We will provide an overview of several of the most important legumes, with regards to deer and quail, as well as some information about the identification, ecology, and management of each. We'll also touch on a few exotic and invasive legumes to watch out for.

Native wild legumes

When it comes to bobwhite quail management, perhaps the most impor-

tant duo in the legume family are the **lespedezas** (*Lespedeza* spp.) and the beggarweeds (*Desmodium* spp.). Although use by other bird species may be limited, the seeds of lespedezas are probably the most important for bobwhites out of all other native plants. Lespedezas are typically perennial herbs (or shrubs) with three leaflets, which can be either glabrous (smooth) or pubescent (hairy). Most lespedeza species bloom in late summer and their

fruits form a one-seeded pod that doesn't split open to release the seed (as in many other legumes). When it comes to identifying beggarweeds and lespedezas, it can sometimes be difficult to distinguish between the two. One main difference between the two genera is that lespedezas have stipules (leafy bracts) at the base of the petiole (main leaf stalk leading to the leaflets) while beggarweeds have stipels (small leaf-like structures) at the base of each of the three leaflets themselves. There are a dozen or so species of lespedezas native to the Southeast, and the list includes upright varieties like hairy (*L. hirta*), round-headed (*L. capitata*), slender (*L. virginica*), and narrow-leaf lespedeza (*L. angustifolia*), as well as ground-creeping varieties like trailing (*L. procumbens*) and creeping lespedeza (*L. repens*). Again, all of these are favorite seed plants for bobwhites and in some cases provide good foraging cover as well. Essentially all of these native lespedezas are also preferred deer forages. Native lespedezas are becoming more popular now in wildlife and pollinator seed mixes or as stand-alone commercially available native seeds, although they are not cheap. Pure round-headed lespedeza seed for example can cost about \$100 per pound. But a pound or two of seed may actually be enough to "inoculate" your property if a particular legume species is absent. As quail management and native ecosystem restoration becomes more common and demand continues to grow, prices should become more affordable.

In addition to the native species, there are also a few introduced non-native varieties that have been planted extensively for bobwhites over the past few decades (mainly *L. bicolor* and *L. thunbergii*). While these exotic species do produce abundant seeds that are used by quail in late winter, both of these species can become unruly and can eventually take over an open timber stand, displacing quality nesting and brooding habitats (which are usually the

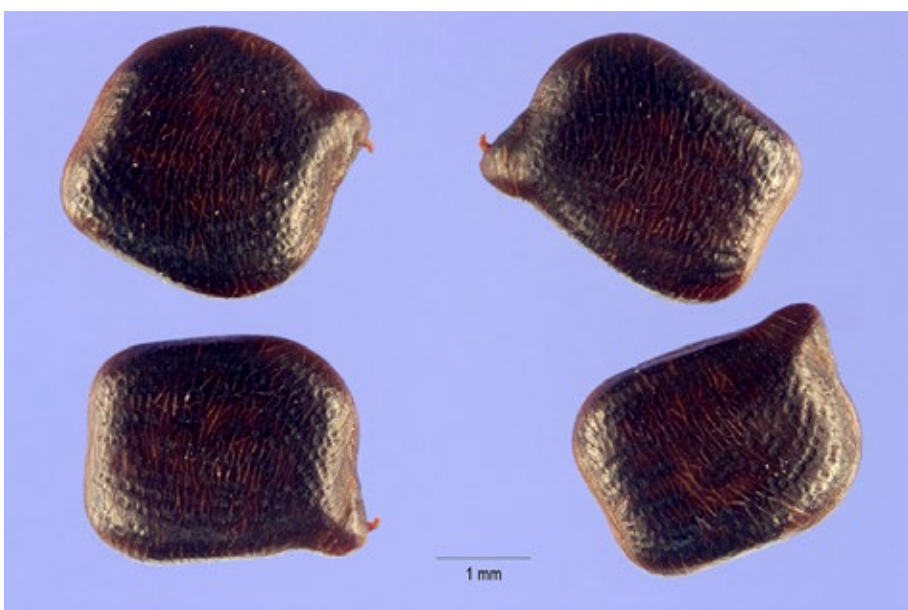


Beggarweeds (also known as ticktrefoils) are also very important producers of bobwhite seeds. Most managers are familiar with the flattened segmented loments or fruits ("sticktights" or "beggarlice") that hitch-hike on clothing. Stiff beggarweed is shown here. (Photo credit Ted Bodner and James Miller, Bugwood)

real limiting factors in bobwhite populations). This invasive trait seems to be especially true in clay-based soils. When released by active management (thinning and burning), bicolor will often march across the landscape, spreading by dropped and bird-dispersed seed. Since the seed coat is very hard, it can remain viable in the seedbank for many years. Once the bicolor stand becomes established it can be very difficult to eradicate. Even after the adult plants are killed, each time soil disturbance occurs another cohort of seedlings sprouts up. I know many quail managers who now spray bicolor (with herbicide) instead of sprigging it. We'll cover some other invasive legumes towards the end of this article.

Beggarweeds (*Desmodium* spp.), also known as ticktrefoils, are also very important producers of bobwhite seeds. Most managers are familiar with the flattened segmented loment ("stick-tights" or "beggarlice") that hitch-hike on clothing. This hitch-hiking is simply a dispersal strategy and is accomplished with tiny hook-shaped hairs that line the outside of the loment, naturally designed to attach to animal fur. These fruits (along with the seeds inside) are important foods for bobwhites, wild turkeys, and ruffed grouse, and the foliage is highly preferred by deer. Most of the twenty-something species of beggarweeds are upright and re-sprout each year from a rhizome (perennials). Flowers are usually purple, pink, or white and typically appear in late summer. Common species in the Southeast include smooth (*D. laevigatum*), stiff (*D. obtusum*), Dixie (*D. tortuosum*), dollar-leaf (*D. rotundifolium*), and pine barren tick-trefoil (*D. strictum*).

The **wild bean**, or trailing fuzzy bean, (*Strophostyles umbellata*) is a twining herbaceous legume that acts like a vine, creeping along the ground in open forest stands on sandy soils. This legume has relatively long petioles and both stipules and stipels described above. This species produce a pinkish



The black chicklet-shaped seeds of partridge pea are used heavily by quail in winter, and even into early spring. If native partridge pea populations exist on your property, releasing them using the methods described here may be the easiest and cheapest. However, if no partridge pea exists on a property, this species can easily be established by planting. (Photo credit USDA Plants Database)

purple flower on an erect stalk in late summer. The resulting fruit is a small (1 – 2 inches long) sharp-tipped pod that turns from green to black in the fall. When mature, the bean pod splits down the middle, releasing several large and hairy seeds. These seeds are like gold for quail, doves, and other seed-eating birds and they are readily scratched out when they drop onto bare sandy soil. This plant is generally found scattered individually here and there through its open sunny habitats, rather than in large clumps or groups. For this reason it is less important to deer than the beggarweeds and lespedezas, although deer do like the taste of it.

Partridge pea (*Chamaecrista* spp.) is well-known in the bobwhite quail management world. Formerly known and sold as *Cassia*, the two most common species are probably the showy (*C. fasciculata*) and small partridge pea (*C. nictitans*). Similar in appearance, they are easy to identify as they both have abundant bright yellow flowers and pinnately compound leaves. The main dif-

ference between the two plants is that the showy partridge pea is larger (up to 4 or 5 feet tall), has larger flowers, and is often hairy along the stem, whereas the small partridge pea is not hairy. When it comes to seed production however, they are very similar. Since these two species are annuals, they produce abundant seeds. These seeds are propelled from the mature flat seed pod as it dries, twists, and finally pops open. This explosive unraveling of the pod releases many hard, black chiclet-shaped seeds. These seeds are used heavily by quail in winter, and even into early spring. Partridge peas are often planted on properties by land managers for this reason. However, naturally occurring populations can be released and encouraged to proliferate by disking, burning and/or thinning. Partridge peas can form large dense colonies and provide excellent cover and brood-rearing habitat in summer.

If native populations exist on your property, releasing them using the methods described above may be the

easiest and cheapest. However, if no partridge pea exists on a property, this species can easily be established by planting. When planting partridge pea, most managers broadcast seed onto bare soil (disked or otherwise disturbed) from late winter to early spring at a rate of about 10 to 15 pounds per acre. As with any native seed purchase, a good practice is to buy good seed from as close to your geographic location as possible for best results. An incomplete fertilizer (such as 0-20-20) can be used depending on existing soil conditions. Partridge pea does best on soils with a pH range of about 6 to 6.5, but can tolerate and produce seeds on a wider range than that. Partridge peas will readily re-seed themselves and can be maintained in the stand by disking or burning every couple of years. Old log landings, linear food plots, and other forest openings generally make good partridge pea patches, as long as they get enough sunlight and periodic disturbance. Deer will readily browse partridge peas and they are also important

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larval and adult food plants for butterflies, native bees, and other pollinators.

Less important than the species described above, but still preferred by bobwhites, **snout beans** (*Rhynchosia* spp.) are fairly common legumes of southeastern pine forests and openings. There are about 10 species across the region and all arise from a tuberous root and are perennials. Perhaps the most common species of snoutbean, the dollar-leaf snoutbean (*R. reniformis*), has hairy rounded leaves and hairy stems and grow in a short, clumped arrangement. This species is typically found only in the sandy soils of the coastal plain. It has terminal clusters of yellow flowers (late summer) and forms short, hairy pods containing a couple of dark brown seeds each, which are favored by bobwhites. Outside the coastal plain, the twining snoutbean (*R. tomentosa*) is often the more common species. It is similar in its seed production but has a climbing, viney habit and three hairy leaflets. Like the wild bean, these plants are generally sparsely scattered though upland stands, making them only moderately important to wildlife species like deer, bobwhites, and other birds.

The spurred butterfly pea

(*Centrosema virginianum*) is a delicate slender vine that resembles a miniature snap bean plant. However, it is a wild native legume that is common across the Southeast on dry to moist soils in open woodlands, edges and along roadsides or fence rows. This species has large circular-shaped flowers (violet-blue) and blooms from early June to late August. The fruit is a long skinny pod that contains many (15-20) cylindrical seeds that are sought after by bobwhites and other ground-feeding birds in late fall and winter. A similar species called Atlantic pigeonwings (*Clitoria mariana*) is also common across the Southeast but it has a more elongate flower and produces fatter, fewer-seeded pods. However, the larger seeds of *Clitoria* are reported to be less

preferred by quail than *Centrosema*. The spurred butterfly pea is not typically planted or deliberately managed on the landscape as with partridge peas or lespedezas, but rather exists scattered as single vines or small groups of plants,

providing from a few to a few hundred seeds at each location.

While some of the previously described species do not typically form large dense colonies, **vetch** (*Vicia* spp.) may occupy an entire meadow or field.



The spurred butterfly pea (*Centrosema virginianum*) has large circular-shaped flowers and blooms from early June to late August. The fruit is a long skinny pod that contains many (15-20) cylindrical seeds that are sought after by bobwhites and other ground-feeding birds in late fall and winter. (Photo credit Ted Bodner and James Miller, Bugwood)

Vetch is a great and often under-appreciated wildlife plant. While its seeds are not generally as valuable to quail, turkeys, or songbirds, the foliage it produces makes it well worth mentioning here. There are several common species, all of which are vines and have pinnately compound leaves. Vetch foliage is consumed in the spring by turkeys, deer, rabbits, quail and other wildlife. The protein content of purple vetch ranges from 16-28% and digestibility can be over 80%. Dense meadows of vetch can also make very good nesting habitat for turkeys.

Other common native legumes include **pencil flower** (*Stylosanthes biflora*) and **goat's rue** (*Tephrosia* spp.). Pencil flower is a small yellow-flowered herb that grows in dry sunny uplands and edges. It blooms in mid-summer and produces pods with single large seeds. These seeds are readily eaten by bobwhites and other ground-feeding birds like sparrows and finches. Goat's rue (also called hoarypea or devil's shoestring) looks similar in its appear-

ance to vetch but is coarser and has stouter, non-twining stems. Flowers range from yellow and white to pink, and the fruits form one inch pods containing several round seeds. The seeds of goat's rue however do not seem to be as important for bobwhites as those of the pencil flower.

Cultivated Varieties

In addition to the many important wild native legumes found in the Southeast, there are obviously also several agricultural legume crop varieties that can supplement nutrition for wildlife species. The most popular legume wildlife crops are probably **clovers** (*Trifolium* spp.), **soybeans** (*Glycine max*), and **iron-clay cowpeas** (*Vigna unguiculata*). There have been many previous *Wildlife Trends* articles discussing food plot crops and maintenance so I won't go into great detail here, but since these are in fact legumes, they do fit into our discussion. All of these legumes are basically high in protein (all three can produce foliage

in the 30% crude protein range) and digestibility and therefore they are commonly planted, mainly for deer to increase nutrition and promote antler production. Clovers (including red, crimson, and white varieties) are cool-season perennials and actively grow throughout the winter, whereas soybeans and cowpeas are warm season annuals. Since these are modified crop plants there are many cultivars and varieties, each having its own suite of traits and characteristics. Red clover for example has several improved varieties (including Red Gold, Kenland, Bulldog, Redland, and Cherokee) that are genetically selected for a specific region or soil type. Cherokee is a good choice for the hot climate of the "Deep South". Red clover is sown using a broadcast rate of 15 lbs. per acre or drilled at 10 lbs. per acre, while the smaller-seeded white (Ladino) clover is planted at 5 lbs. and 1 lbs. per acre, respectively. All clovers are best established using a well-prepared and firm seed bed. Seed should be culti-packed, allowed to settle

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with a rain, or only lightly covered with a very thin layer of soil. Besides deer, clover food plots also are obviously used heavily by wild turkeys.

Soybeans and cowpeas are generally planted for garden or commercial agricultural purposes and therefore deer often benefit by “stealing” some of the crop. But these crop plants are also regularly planted in warm-season food plots specifically for deer nutrition. Like clovers, there are many varieties of each. Cowpeas are a favorite crop of managers because they are easy to establish and are quickly sought out by deer (and rabbits and other wildlife). Deer especially like the taste of fresh new cowpea runners. Cowpeas are a great forage and can be an effective hunting attractant until the first hard frost. However, the benefits of soybeans can actually persist for much longer. Both soybeans and peas are typically planted in April and provide green forage throughout the summer, but then

soybeans can still be used by deer in the form of grain (dried beans in the pods) throughout the winter. Small patches of soybeans will likely get hit hard however, and it generally takes a large field (5 acres or more) to produce enough soybeans to hold a deer herd through winter. On smaller fields they will usually eat all the beans by the fall. Where soybeans do make a dried crop, bobwhites will take also advantage of beans on the ground. Some quail managers actually plant soybeans specifically to provide fall and winter seed for quail, and exclude deer with fencing. Interestingly, Palmer and Lane (1999) found that agricultural fields where no-till soybeans were drilled into wheat stubble also provided excellent brood habitat for quail. They also noted that quail chicks gained significantly more body mass in no-till soybeans fields versus tilled soybean applications, so the planting method apparently makes a big difference with regards to the structure as

well as the plants and insects that come in alongside the crops. Both cowpeas and soybeans can be broadcast at about 75 lbs. per acre or drilled at about 45 lbs. per acre. Recommended fertilizers for these and other legume crops typically lack a nitrogen component and only contain phosphorus and potassium.

Lablab (*Lablab purpureus*) is similar in appearance and growth form to cowpeas and soybeans and it is sometimes used in combination with, or as a substitute for, traditional deer plantings. Lablab is native to Africa and tolerates hot and dry conditions well. It is similar to soybeans in its nutrition levels. Some deer managers also plant perennial **alfalfa** (*Medicago sativa*) as a supplemental food crop. Alfalfa is typically grown as a cattle forage or hay but it, like lablab, can tolerate dry conditions and can live for several years. However some managers find that it can be difficult to establish as a wildlife food plot.

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Undesirable Legumes

Despite the many advantages and benefits of legumes, some members of the pea family can be real pests. Most of these leguminous weeds are, like bicolor lespedeza, exotic and native to other parts of the world. Since our native wildlife and plant species aren't adapted to living with and these exotics, they can often pose problems with regards to displacing the plant communities we as land managers want to promote. **Kudzu** (*Pueraria lobata*) is probably the most notable invasive legume in the Southeast. It is native to Southeast Asia and is often difficult to control. Deer will sometimes browse kudzu but not many managers find it to

be worth the mess. Everyone knows what kudzu does to trees and buildings. It and some of these other pests are essentially doing the same thing to quality wildlife habitats if they happen to be adjacent. **Wisteria** (*W. sinensis*) is another Asian exotic and essentially behaves similar to kudzu, although it's not quite as aggressive in most cases and has a more woody stemmed vine. There is actually a native wisteria (*W. frutescens*; mainly found in sandy coastal plain soils) that doesn't form thick tangled infestations, but it is less common than the invasive varieties. Like kudzu, deer will sometimes browse wisteria but this minor benefit hardly ever offsets the various negative

traits. **Coffee weed** or **sicklepod** (*Senna obtusifolia*) is a fairly common sight in old agricultural fields, and it can also infest wildlife openings and forest edges. It is called coffee weed because in China, Korea, and other places its seeds are roasted, ground, and used as a medicinal coffee or tea. Coffee weed looks somewhat similar to partridge pea, but larger. It's not typically too much of a problem in undisturbed timber stands but it has no known wildlife value and can be a pain when trying to establish food crops for game species. Other pest legumes include **mimosa** or **silk tree** (*Albizia julibrissin*), and **Chinese lespedeza** (*L. cuneata*), both of which are also native to Asia.



Both soybeans and peas are typically planted in April and provide high protein forage throughout the summer, but soybeans (shown here) can still be used by deer in the form of grain (dried beans in the pods) throughout the winter.

Mimosa trees spread fairly quickly along roadside habitats or edges and shade out native plants. Chinese lespedeza is much shorter in height than bicolor and has small creamy white flowers. It was planted in the late 1800's as a mine reclamation species for erosion control, as well as for livestock forage (although it is reported to be high in tannins and is typically unpalatable to grazers). It can effectively take over roadsides, meadows and fields and can be very aggressive. Although silk-tree flowers serve as a food source for many bees and hummingbirds during summer, and the Chinese lespedeza can provide nesting and foraging cover for turkey, quail, and other species, neither are recommended for wildlife plantings. Native species can serve the same purposes without the threat of taking over and displacing the other important habitat components.

One other thing worth mentioning here is that **Clopyralid** (also known as **Transline**), a selective herbicide, is effective on most of these exotic

legumes while not harming many other common plant families, like pines, oaks, or grasses. This option makes it possible to treat infestations of pest legumes within plantations or food plots without killing the desirable non-target plants or tree seedlings. Many other readily available herbicides are effective on legumes as well. Consult the product labels for individual species control rates and applications.

Conclusion

In summary, peas and beans can play an important role in a wildlife management program. Whether using crop species for supplemental plantings, or promoting the expansion of native legumes through thinning, disking, and burning, legumes can provide high quality nutrition in the form of forage and seeds. Just like in *Jack and the Beanstalk*, the planting, promotion, or release of legumes for game species like bobwhite quail, white-tailed deer, and wild turkeys can yield BIG results!

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Staff



Chufa can be planted in rows or broadcast. (Photo by National Wild Turkey Federation)

For several years, Allen Deese with The Wildlife Group and I have enjoyed working the information booth at the National Wild Turkey Federation convention in Nashville. If you've never been to this gathering you owe it to yourself to attend. We're there to answer questions about a range of wildlife management subjects such as tree planting and care, food plot strategies, predator control and more. But the number one subject these turkey fanatics want to know about more than anything else is...CHUFA!

There really is no better crop you can plant to attract and hold turkeys on your property than chufa. Sometimes called *ice cream for turkeys*, *ground almonds*, and *hog peanuts*, the chufa is a perennial in the family of the nut sedge grasses. The $\frac{1}{4}$ to $\frac{1}{2}$ inch long underground nutlets or tubers of the chufa plant are highly sought by many species of wildlife other than turkey. Racoons, deer, and wild hogs will scratch

up the plants to get to the tubers. In fact, chufas were first planted in the southeast US as feed for hogs allowed to free-range in winter and spring. The taste of the tubers is very similar to coconut, they are sweet and high in fat (21%). Chufas are thought to have been first cultivated in Africa and southern Europe, but they are very widely adapted and can be grown in almost all regions of the Southeast.

Turkeys begin scratching out the tubers in the fall, after the tops have turned brown. In southern areas, they will continue using chufa throughout the winter and into the spring. In areas where the ground freezes and snow accumulates, it does not provide a source of food during the winter. Once turkeys begin using chufa, they will visit the field regularly until the tubers are gone or spring green-up provides a more desirable food source. A chufa patch that is being used regularly by turkeys looks like a herd of hogs has been rooting in the field or takes on the appearance of craters on the moon.

Chufa produces a fast growing yellowish main stem which is triangular shaped when cut in cross section. The bright green leaves attached to the stem can grow up to two feet long when chufas are planted in good soil. The edible tubers are produced on the ends of rhizomes (root like structures).

Soil Requirements

Finely textured, highly moist soils are ideal chufa growing sites. Chufas can be grown on a great many soil types but normally do best when planted in moist, silty, loamy and sandy soils. Clay soils also can produce chufas if the site is well broken prior to planting. When clay soil becomes packed it is much harder for turkeys to scratch up the tubers than it would be on looser, sandy loams. Chufas require a slightly acid to neutral soil pH of 5.0 to 7.5. Since chufas compete poorly with grasses and weeds, it is advisable to select fallow or new ground for plots versus a recently

cultivated area. Log landings, right-of-way's and abandoned logging roads that get plenty of sunlight are excellent spots. If chufas are put on recently cropped sites they should be planted in rows so weeds can be controlled by cultivation. Otherwise, chemical weed control will be required.

Plot Size

The real objective of growing chufas for wild turkeys is to grow enough so that there will be plenty left to attract turkeys during spring hunting season. Since the tubers are mature at the end of summer and many other species of wildlife like to eat chufas, fairly large plots need to be planted. Plots of one to five acres are needed where wild turkey populations are high. Tubers in plots that are less than one acre are usually gone by turkey season and even sooner in years of poor acorn production.

The number and distribution of plots will vary with turkey population size

and other habitat features present on a particular tract. However, a good rule of thumb is one acre of chufa per 100 acres of turkey habitat. When growing conditions are normal, enough tubers will be produced to have some left to attract your turkeys during the spring season.

Planting Chufas

Planting Dates. The best time to plant chufas is the last two weeks in June. Planting at this time will assure that soils are warm enough for the tubers to sprout and there is plenty of time for the plants to mature before fall. The range of acceptable planting dates is from May 15 through July 10.

Preparing Plots. Begin disking plots about one month prior to your planned planting date. Early disking will cause weeds and competing grasses to sprout and then be controlled by repeated disking. If weeds continue to be a problem, a pre-emergent herbicide can be applied



*The ¼ to ½ inch long underground nutlets or tubers of the chufa plant are highly sought by many species of wildlife other than turkey.
(Photo by National Wild Turkey Federation)*



FIVE STEPS TO SUCCESS

- The most important thing to remember is that chufa requires 90-110 frost-free days to mature. Plant chufas in the spring after danger of frost has past. It can be planted through August 1 with good success in the Deep South. Select an open area that receives full sunlight. Chufa will grow in a variety of soil types, but it does best in moderately-to well-drained soils. Sandy or loamy soils with good soil moisture are preferred. Planting less than 1 acre could result in crop damage and over browsing.
- Prepare the seedbed by plowing or disking.
- If you cannot get the soil tested, use 400 pounds of 10-10-10 or 13-13-13 fertilizer and 1,000 pounds of lime per acre.
- It is best to use a no-till drill or row planter with peanut plates to plant the seed. You can also broadcast 40-50 pounds of chufas per acre. Cover seed with a minimum of 1 ½ inches of soil using a disc or harrow. Planting too shallow is worse than too deep.
- Weed control is critical to success. Chufa does not like competition.

in advance of planting.

Fertilizing and Liming. Soil test well before planting. Lime and fertilize according to test results. Chufas grow best at a pH of 6.5, but tolerate a range from 5.0 to 7.5. General fertilizer recommendations without a soil test are to apply 300 to 400 lbs. of a balanced fertilizer like 10-10-10 or 13-13-13 per acre just prior to planting. When plants are 8 to 12 inches tall, side or top dress with about 100 lbs. of ammonium nitrate per acre.

Planting. Chufas can be planted in either rows or by broadcasting. Planting in rows has the advantage of allowing cultivation to control weeds and reduces planting costs because fewer tubers are used. Raccoons and hogs will often destroy a chufa planting in rows because of the ease of feeding down the rows. If raccoon and hogs are numerous in the area you plan to grow chufas, a broadcast planting is recommended. Rows should be 36 to 42 inches apart and chufas should be planted at a rate of 20 lbs. per acre. Planting depth is ½ inch deep. When broadcast planting, evenly distribute 30 to 40 lbs. per acre in a well- prepared seedbed and lightly disk to cover about ½ inch.

Maintaining Chufa Plots

Grazing and soil compaction by livestock is detrimental to chufa plantings and livestock should be excluded from

patches. Chufas are classified as a perennial sedge, and production from a single planting can be extended for several years by disking and fertilizing in the spring. However, in areas where high turkey populations are present, few tubers may be left and poor stands result the following year. As a consequence, the best yields result from reseeding plots each year.

After three years, chufa plots need to be moved to a new location. Relocating is necessary to prevent damage from weeds and insects. The original plots should be allowed to go fallow for several years, then they will be ready to use again when chufas need to be moved again.

Introducing Turkeys to Chufas

In locations where turkeys have never been exposed to chufas it may be necessary to expose some tubers so the turkeys can try them. If turkeys are present in the area but are ignoring your chufas, pull up several plants at random locations across the plot or lightly turn a strip with a disk. When turkeys find this new food item and the acorns run out, the use of your plots will noticeably increase.

Regrowth

You will likely need to replant chufas every year. It is possible to get a decent volunteer stand from the previous year's

For weed control use the following herbicides:

Pre-planting (incorporated into the soil)

Treflan-1 quart per acre **OR**

Prowl-1 quart per acre

For grass control after chufa is established (sprayed over the top):

1.5 pts. Poast + oil surfactant per acre **OR**

1.5 pts Fusilade + oil surfactant per acre

For broadleaf weed control after chufa is established (sprayed over the top):

1 to 2 pts. 2, 4-DB (sicklepod, cocklebur, etc.)

For most surfactants:

1 qt. per 100 gallons is the recommended rate.

Note: Always read and follow label directions

crop, provided that the turkeys do not eat it all. If you have enough chufa left in your field in late spring, apply 400 pounds of 10-10-10 or 13-13-13 fertilizer per acre and thoroughly disc to incorporate fertilizer and distribute chufa seed. After 2-3 years, rotate the chufa to another field to prevent potential problems with soil pests.

GREAT FOR WATERFOWL, TOO!

Chufas are also one of the best-kept secrets for waterfowl. Follow regular planting instructions when ponds/wetlands have been drawn down. After chufas mature in the fall, flood chufa with 10-14 inches of water. You will be amazed when you see your ducks swim past flooded corn and millet to get to your chufa!

References

National Wild Turkey Federation, Turkey Gold Chufa brochure

Wildlife Trends Journal – Volume 1, Issue 4

National Wild Turkey Federation, Chufa “Turkey Gold” Wildlife Bulletin, No. 7



This is a Merriam turkey I took in South Dakota this year to complete my Grand Slam. Although chufas don't grow especially well in northern climates, I really just wanted to show off this magnificent bird!

The Effects of Flooding on Lakes



By Scott Brown

Scott Brown is a biologist and regular contributor to *Wildlife Trends Journal* with over 30 years experience in research and managing natural resources throughout the Southeast. Scott founded Southern Sportsman Aquatics & Land Management in 2007 and now has clients from Texas to Florida, and into the Carolinas. Scott can be reached at scott@southernsportsmanaquatic-sandland.com or (336) 941-9056.

Flooding on ponds can have both negative and positive effects. Here natural materials such as leaves, sticks and sediment are headed downstream towards the pond. Other runoff can include organics from agricultural fields and livestock pens.

All lake owners experience flooding of their waterbodies at some time, and depending where you are located, you may be experiencing it this spring. Not all aspects of a flood are bad or detrimental to habitat and fish. I have frequently said fluctuating water levels are a good thing for a waterbody, and spaced out over time are highly beneficial.

Effects of Flooding

Occasional floods are good for lakes as long as fish are not lost or new species of fish or plants are not introduced from nearby waterbodies. And if this does happen, there are steps to take that will help minimize their effects on the existing fish population. An occasional flood can reduce submerged and shoreline vegetation. High water covers areas that once had just a couple of feet and now have several feet of

possibly dirty water prohibiting vegetation growth and shading out/killing plants if the water remains high for an extended period of time. It can increase the pond acreage and, depending on the time of year, it can increase acreage of quality habitat which increases all fish numbers, particularly forage species.

Water quality will initially decline during a flood. Either organics are washed in, or as the water rises it floods nearby uplands and the dead or dying vegetation in newly flooded uplands (woods, pastures, agricultural fields) will lower Dissolved Oxygen (DO) levels. When flooding occurs quickly, stress or a fish kill can occur due to excessively low DO levels. If it happens

slowly over time things will remain stable. Water washing in from nearby swamps, woods or pine forests, may begin to drop pH (become more acidic) and needs to be checked shortly after the event. Turbidity (muddy water) can also increase during flooding depending on bare ground surrounding and upstream of the waterbody or from water washing in dirt from excessive shoreline erosion. Temporary muddy water does not negatively impact fish.

Soil may be added to your lake and reduce water depth in certain areas if erosion is an issue. At the emergency outflow, soil and small gravel can be eroded and wash downstream. Organics (dead plants, fertilizers, animal waste)

from nearby agriculture practices can both reduce pond depth and increase poor water quality during and after a high-water event. An extreme event can damage the dam or cause it to fail, in which water and soil can be transferred downstream along with organics if the lake is older. A temporary period of low visibility may occur due to suspended dirt particles washing into the pond or forceful inflow, disturbing what has previously settled on the lake bottom.

As water rises, aquatic plants may begin to die-off from being in too deep of water, while upland plants may also start dying from being inundated with water for too long. If water stays up long enough, aquatic species may begin



At one point the nearby river (300-500 yds. away from these isolate ponds) flooded all the lakes and ponds on this aerial photo for several days, removing fish and depositing new species normally not seen in a private pond ecosystem.



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growing in the new shallows of flooded areas. Floods on smaller waterbodies generally last shorter periods of time than droughts, so aquatic and/or shoreline vegetation may not be affected at all by short term flooding.

As stated earlier, fish are exposed to new high quality habitat for hiding and feeding, if shorelines are not manicured. If the water stays up for an extended period, fry and fingerlings will benefit from the added feeding and loafing areas. A flood just prior to or during a nesting species' spawning time can have devastating effects on the year class the flood occurs. Water suddenly too deep may have adults abort spawning or cause water chemistry issues unfavorable for successfully hatching eggs or fry surviving the critical first few days. If the flood is short term, those species may try and spawn again when water drops to normal levels. The best time for a flood is just after all species have spawned and hatched so those fry and fingerlings may benefit from the newly flooded additional habitat for hiding from predators and the abundant food source of insects normally not available. During excessive flooding, fish can be lost downstream as they swim or wash over the dam or through the outflow. Also, fish from surrounding rivers, lakes and creeks can wash into your lake and get trapped in your waterbody. Some may be undesirable and/or exotic species that can cause issues in the future depending on the size of your waterbody and your management objectives.

If you are near the coast, flooding from a hurricane can push saltwater into your freshwater lakes and ponds through drainage pipes, canals, creeks or sheet flow across uplands. A quick change in salinity can stress and/or kill fish. The salinity change may last long beyond the effects of the high water, as for it to change, fresh water is needed to dilute the salinity, lowering it to its normal levels.

If the flood occurs in the fall, water-



Should items like fish feeders, fountains or aeration systems (pictured) become threatened from high water, turn off power and relocate to higher ground. The first defense against water damage is to install these items above the high-water line that may become inundated with rising water.



This electrofishing sample in a freshwater pond just a few hundred yards from a saltwater marsh turned up two saltwater species and one bluegill four months after a hurricane.



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fowl and wading birds may benefit from the addition of flooded food sources normally not present. Depending on the newly flooded habitat, you may see bird species never observed before or in greater numbers than previously witnessed.

What Can Be Done During or After a Flood to Help Your Lake

The most important thing to monitor during a flood event is the dam, if your lake has one. Inspect periodically looking for leaks on the backside at top and bottom. Make sure the outflow doesn't get clogged with debris and clean as necessary. Do not cover the outflow with a screen or fencing to save fish as it will clog even faster with sticks,

leaves and debris. Watch the emergency overflow and look for erosion. Should the dam look like it may fail, opening any valves, adding a pump run by a tractor, diesel engine trash pump or siphon to get additional water out may alleviate pressure on the dam. Consider any landowners downstream that may need to be notified prior to a dam breaking. Feeders, aeration or fountain pumps should be monitored and moved to higher ground to prevent water damage if necessary. If a dwelling is nearby, make sure drainage pipes, ditches and canals are clear around it to avoid water back up causing damage.

During periods of excessively high water watch for escaping fish through outflows, over the dam or sheet flowing

across uplands. If excessive numbers of fish are observed washing downstream, restocking certain species or all species may be necessary. Fish entering the lake from nearby waterbodies will be observed in an electrofishing survey after the event is over and the water subsides.

If during a flood, you witness fish at the surface gasping for air and/or dying, the only thing that can be done is adding surface aeration. Aeration can be performed with large surface aerators run by tractor or electricity. Surface aerators agitate the water vigorously and raise dissolved oxygen levels to create areas where fish can congregate until the DO throughout the lake rises naturally. These are common at fish



Once water levels recede and water chemistry parameters stabilize, conducting an electrofishing sample to inventory what species are present, numbers and sizes is recommended.



hatcheries, but do work for temporary low DO fixes in a time of emergency. We have heard of commercial hatcheries loaning or leasing them out to landowners in an emergency. If the lake is too large it probably will not help and you must let nature run its course and deal with the population change after the event. The only antidote for salinity intrusion is freshwater, usually from a nearby well. When water begins to fall, flushing with fresh ground or well water can be done to help lower salinity on the back end to preserve more fish. This being feasible depends on the waterbody size and access to freshwater. The long-term fix is freshwater runoff from rain.

Once the water recedes to normal levels, check water chemistry. Then recheck water chemistry in a month to document any changes and see if the parameters stabilize and return to previous readings. Salinity intrusion takes longer to subside than other parameters if relying on rainfall. Most parameters should return to previous levels quickly, but if pH does not, applying agricultural lime may be necessary to bring it to pre-flood levels if in an area where natural pH is low. Usually, only pH and salinity are affected long term from flooding, especially in the Southeast, or where a liming program has been initiated prior to a flood event. Turbidity should subside after the event and water should return to the clarity it was earlier once surrounding shoreline vegetation fills back in where erosion occurred. Once the event is over, if muddy water persists, things can be done to reduce turbidity and increase visibility by dispensing gypsum, Alum or green hay.

Long term flooding may affect surrounding upland trees. They may become stressed and even lose leaves during or after a flood event, depending

Flooding and temporary dirty water will not hinder your fish population unless poor water chemistry develops. Fish will survive and possibly thrive during an occasional flood.

how long they were in water. Some trees can be in water for months without being affected, while others begin to stress in just a few days. However, do not cut down any trees that lost their leaves until they have had a chance to go through the following year green-up period. If after the following spring, they do not get leaves, they can be considered dead and removed.

Continue to survey the vegetation after a severe flood. It is not uncommon for other things besides fish to be introduced to your lake. Undesirable plant species can be fragmented (broken up) or uprooted from a nearby waterbody or upstream and transplanted in your lake after the water recedes. Particularly plants like Hydrilla, milfoil, Naiad and other submerged aquatic vegetation that can transplant from fragmentation (pieces breaking off and re-rooting elsewhere). As soon as any exotic or undesirable plant species are identified, treat with herbicide or mechanically remove.

Have an electrofishing survey conducted once water levels return to normal. Do not perform electrofishing sur-

veys during above normal water levels as the results may be less representative of what is actually present. During high water, fish are disbursed and render lower catch rates with electrofishing or angling. The electrofishing survey will help determine what species (new and old) are present as well as the numbers and sizes of remaining fish. Stocking may be required. Grass carp are particularly susceptible to swimming/flowing out of a waterbody during a flood. Once water levels go down, surface sightings and electrofishing will help to determine how many should be added.

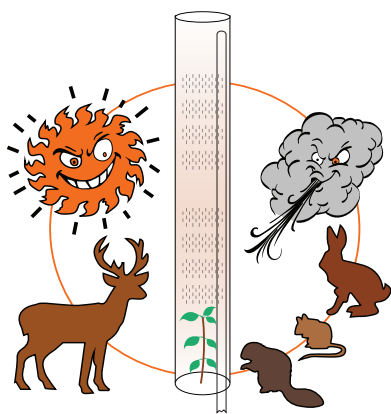
If mostly undesirable fish species remain in your lake after a flood, starting the fish population over may be a necessity. A professional should be consulted to assess the fish population, possibly apply Rotenone (fish toxicant) and create and implement a new stocking strategy. This is a rarity, but is required on occasions, especially when a nearby creek or river becomes part of your lake during the flood. After severe flooding, we have documented about every species from that particular

region from nearby rivers in isolated private ponds hundreds of yards away with no connection. And after a hurricane we have had ponds temporarily flip from freshwater fish to exclusively saltwater species, until the salinity reverted back and the saltwater species perish. Then restocking with freshwater species is required. Do not restock any fish until water chemistry has been checked and all parameters fall within acceptable levels for the fish species being stocked.

An occasional flood or drought event is overall good for a waterbody. Waterbodies that never fluctuate develop water chemistry, sediment and vegetation issues more often than ones that experience occasional fluctuation. Flooding that occurs too often is detrimental to waterbodies and never allows them to reach their full potential, since they are always trying to recover. Floods and droughts can leave a lake owner feeling helpless. But doing the right things before, during and after will help expedite the recovery and may even improve the waterbody.

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No-Till Planting



By Daryl Bell

Daryl Bell is a freelance outdoor writer from Mobile, AL and President of the newly formed Five Rivers Delta QDMA Branch. Contact him at darylbell7041@gmail.com.

Soybeans in Alabama growing in a layer of organic matter that has been building for 2 years.

I think everyone is familiar with the disking and tilling style of planting. You know, the style where you come in and disk or till your soil and destroy all your organic matter? In the past and to this day, this style of planting dominates our country from farming practices to food plots. When I give seminars on no-till planting styles, I'm told I'm crazy, I've been told that it doesn't work and I've even been told that I have no idea what I'm talking about, but I'm here to tell you, no-till works for me and is the way to go.

Disking or tilling your soil is simply on its way out the door, so to speak. It dries up your soil bed, it destroys organic matter, it kills earth worms, and it unveils a seed bed of weeds beyond comprehension. In the past, to get a good yield from your food plot, you would have to fertilize, spray for weeds, and pray you get enough rain. While the rainfall can always be a challenge, I can tell you that last fall I had

2-4-inch-tall food plots all the way through that wicked drought.

Not only can no-till save you money and limp your food plots through droughts, but you'll also have substantially better food plots using this method than the old-school disking and dragging style of planting. Just last year I was able to grow turnips that were 3 ½ foot tall in my test food plot right behind my house. The soil pH was 5.2 and I never applied the first bit of fertilizer. How was I able to do it? Organic matter.

Creating Organic Matter

You may have heard of organic fertilizer in the past. Cow manure, chicken manure, compost, all of these are examples of organic fertilizers. Organic fertilizer is simply dead, decaying matter that is releasing nutrients back into the



Once soil has reached an adequate temperature, even clover will bust through a thick layer of organic matter.





Over time, the organic matter will break down, revealing a carpet of clover.

soil. When applied on top or around a growing plant, these nutrients become readily available to the plant, just like your typical NPK fertilizer.

I remember when I was a kid watching my grandmother create this giant compost pile of leaves, plants, manure, and the occasional banana peel. I never really understood why she would put that combination of rotting material around her garden, but now it all makes sense. All those things were breaking down and releasing nutrients. Most folks would just cast aside old plant matter from their garden, when in reality they were missing out on some very essential nutrients.

Just like a garden, your food plots also create great compost. I'm sure most people spray their food plots at the end of the season to prepare for the next season. Where people mess up is disking that dead plant matter under the soil. Sure, that plant matter is under the soil decomposing, but in most cases, it

is out of reach of your annual plant's shallow root system. Therefore, the plant just breaks down and the nutrients it releases just leaches through the soil.

Unlike most people, I don't even own a disk or tiller. I don't have a need for one. My food plots haven't been disked in over 5 years! Instead, I like to leave all the dying or dead plant matter right on top of the soil. This plant matter breaks down, the nutrients are released into the soil, and my annual crop takes it right up. This is just like applying a harsh NPK fertilizer, except I didn't have to go out and actually buy the fertilizer, I recycled it. Over the years, the layer of decaying plant material will build and eventually your plants will be growing in a layer of organic matter. This eliminates the need to ever have to fertilize your food plots again.

A perfect example of this would be my perennial clover fields. Clover is a legume, which means it fixes its own nitrogen right out of the air, eliminating

the need to apply nitrogen fertilizers. However, clover does need supplemental phosphorus and potassium applications. In the past, I would have fertilized my clover fields with something along the lines of a 0-20-20 to meet the plant's need for those nutrients. However, through the process of recycling plant nutrients, I have eliminated the need to ever have to apply that 0-20-20 again.

The way I do this is through broadcasting wheat into my perennial clover stands every fall. The wheat actually serves many purposes. It feeds the wildlife while the clover is dormant, it acts as a cover crop and hold nutrients high in the soil while the clover is dormant, and it recycles its nutrients back to the clover once it dies in the spring. Once spring rolls around, the wheat will mature, go to seed, and die. Once it dies, all the nutrients in the plant will leach into the soil. By this time, the clover is already out of dormancy and is

ready to take in all the nutrients released by the wheat. This eliminates the need for supplemental fertilizers and saving you money and time. Neither the planting of the clover or the wheat required disking or tilling of any kind.

Planting Methods

When planting food plots using a no till method, you really only have two options: a **seed drill** or **broadcasting and rolling**.

The first method I will discuss is **broadcasting and rolling**. This method is great for the everyday guy who does not have access to a seed drill or anyone planting a small seed, like clover. If I am establishing a new perennial clover stand like Ladino or White Dutch, I'll start bushhogging the area I wish to plant. This is assuming the area is clear of trees and brush. If those are present they need to be dealt with first.

After bushhogging, I will come in about a month prior to planting and spray the area with a burn out herbicide

such as Glyphosate. Applying the Glyphosate about three weeks prior to planting will ensure the existing plants in the area have time to die before you come back to plant. Once everything is dead, I simply come back and spread my seed on top of the dead plant material or soil, depending on how thick the area was prior to spraying. After the seed is spread, I'll then roll the area with a culti-packer or sod roller. If you don't have access to a culti-packer, most places that rent equipment will rent you a sod roller. You just fill it with water and pull it behind your tractor, four-wheeler or even your riding lawn mower. Rolling the plot will help ensure good seed to soil contact and roll any grass or dead plants over the seed bed, which will conserve soil moisture.

Once fall rolls around, you'll simply come in and spread your wheat right into the existing clover, no rolling necessary. The clover will shade out the seed bed, ensuring good soil moisture and aiding in the germination of the wheat. Being that clover is a legume

and fixes its own nitrogen, the wheat tends to germinate and grow quickly, so you'll have fall forage quickly and you don't even have to fertilize it. If you did not plant a spring or summer crop, this method will also work on any type of fall food plot you want to plant. Simply follow those steps and you'll be golden.

Let's say you already have a few clover fields and want to plant a summer annual like soybeans, peas, or corn. These will need to be planted using the second planting method – **drilling**. Being that these seeds are much larger, it's harder to get good seed to soil contact using the rolling method. Don't get me wrong, you can be successful planting larger seeds with that method, but it requires higher seed rates and the seed survival rate is much lower, so drilling is the preferred method.

No matter what crop you are planting, drilling is the best way to plant it. The no-till drill will actually put the seed right into the soil at the right level to ensure good germination. This allows you to use lower seed rates as seed sur-



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vival is much better using this method, thus saving you some money on seed. For instance, if you were going to plant soybeans by disking or dragging, or even rolling, you would have to use a seed rate of 70-80 pounds per acre to ensure enough seeds survive to produce a good stand. When you are drilling soybeans, you only have to use a seed rate of 50 pounds per acre.

Once your summer annual is drilled, you have two options for planting in the fall. The first option is to simply broadcast your fall mix into the standing beans. The second option would be to drill the fall mix into the beans. I have had very good success with both methods. The way it works is the canopy of the beans will shade the soil, thus conserving soil moisture and aid in seed germination. The fall mix will germinate, but due to the lack of sunlight it won't really start growing vigorously until the beans yellow out, the sun comes through, and the fall crop gets some sunlight. But once this happens, it grows quickly. Like the clover, soy-

beans are also legumes, so once they die, all that nitrogen is right there for the fall crop to take in.

Using a bean or pea followed by a fall crop is really the ideal food plot situation. You'll have standing beans all winter, as well as a salad bar below the bean pods. Come next spring, you'll just come through and spray the fall crop with Glyphosate. At this point you'll have rotting bean pods as well as a dead fall crop laying right on top of the soil. This is some of the best compost you could ask for. You'll simply drill next year's beans right into all the material on top of the soil and repeat this process year after year.

Both situations I mentioned above are examples of recycling nutrients using your food plot crops. They can be used with any type of fall or spring seed mixes. Whether broadcasting or drilling, your fall crops will always do much better if they are following a legume, such as soybeans. Like I mentioned before, legumes fix their own nitrogen, so once they die, all that nitro-

gen is released right back into the soil and taken up by the fall crop.

Seed Blends

In the South, I tend to stick to a few tried and true mixes for my spring and summer food plots. My summer annual mix is pretty simple, soybeans drilled at a rate of 50lbs./acre on all plots over one acre in size. For any plot under an acre I like to use a clover blend which I'll talk about next. In the fall I broadcast oats, wheat, radishes, and turnips into the standing beans. I use **Eagle Seed Broadside** at a rate of 100lbs./acre to get my wheat, radishes, and turnips and I use 50lbs./acre of oats mixed into the Eagle Seed Broadside. This blend is excellent for building organic matter and the fall plot always does great because it's following the soybeans.

For my spring perennial mixes I like to use **White Dutch Clover** or **Ladino Clover** at a rate of 8-10lbs./acre. In areas of very high deer numbers I prefer the White Dutch due to its ability to

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withstand heavier browse pressure than the Ladino. In the fall, I will broadcast wheat into the white clover at a rate of 60lbs./acre. I've explained before how the wheat aides the clover and this process has yielded great results.

I've recently started mixing **Crimson Clover** at a rate of 12lbs./acre and **Arrowleaf Clover** at a rate of 12lbs./acre into my wheat when I broadcast it into my perennial clover stands in the fall. It adds even more forage for the deer during the winter months and will die back in the heat around the end of April. Both Crimson and Arrowleaf are annual clovers which means they germinate and complete their life cycle in one year. However, they seed pretty well every year, so I see germination every fall from both of these clovers without re-seeding. This mix is rather new to me but so far it has done great and produced tons of food for the wildlife. I will continue to test with it for years to come.

Now, all my plots have been on this no till system for many years, as I mentioned before. So, I have a pretty good layer of organic matter built up. The challenge for most people trying to transition into this planting style will be to get as much organic matter on top of the ground as quickly as possible. For this, I have found that two mixes work fairly well. The first is **Sun Hemp** mixed with **Cowpeas**. The Sun Hemp will shoot up to heights of 8-10ft fairly quickly, providing excellent wildlife cover. The cowpeas will climb the hemp stalks and provide the deer with high quality browse inside that area of cover. Once killed off in the fall before fall planting, this mix is guaranteed to provide you with a thick layer of organic matter to broadcast or drill your fall mix into. I recommend planting the cowpeas at a rate of 30lbs./acre since it will be mixed with Sun Hemp. I recommend planting the Sun Hemp at a rate of 30lbs./acre if drilled and 50lbs./acre if broadcast and rolled. Like beans and peas, Sun Hemp is also a legume, so

your fall crops will do great following the Sun Hemp/Cowpeas mix.

The second mix I like to use to jump start the organic matter build up is a mix of **Egyptian Wheat, Grain Sorghum, Sunflowers**, and Sun Hemp. This mix is designed to be tall and produce a very thick stand. It has a combination of cover and food that will offer ideal habitat for your wildlife. I'll normally do one of two things with these plots in the fall. If the property is lacking in quality cover during the hunting season, I'll leave the plot standing and won't fool with it until the next spring. If the property has ample cover, but is lacking quality food, then I will bush-hog, spray, and drill a fall crop into the plot. Due to how much forage this mix will create, I like to drill my fall plot into it instead of broadcasting and rolling it. Either way, this mix will get you well on the way to having quality organic matter by next spring.

By no means are any of the mixes I listed above the only ones you should plant. There are plenty of other forages that will feed your wildlife while creating plenty of organic matter. These mixes are simply what I have found that works best on my property and in my region.

Additional Benefits

On top of building organic matter, the no-till planting benefits your soil in a number of other ways. One of these benefits is **weed control**. Herbicides used to be one of my greatest expenses when it comes to food plotting. There are so many different weed and grass controls for every different weed, grass, and sedge that you could easily cut into your food plot budget by trying to control these pests. Not that I'm saying you will never have to buy another herbicide again, because you will. Herbicides are very important in maintaining clover stands. However, by using cover crops and allowing organic matter to build up on top of the soil, you can greatly reduce the amount of herbicide

you have to purchase. Weeds need two things to be able to germinate, sunlight and water. By allowing that layer of organic matter to build on top of the soil, not only are you not uncovering new weed seeds by disking, but you are also not allowing sunlight to reach the soil surface. This alone will help substantially reduce weeds.

I lease many farms in SW Kentucky and one thing I notice quite a bit is a lack of cover crops. Some farmers will plant wheat after the corn or beans have been harvested, but many do not. I lease a piece of land that does not use a cover crop and the amount of erosion I see in the fields is insane. There are some wash-outs on the field edges that would completely engulf my truck. By having a build-up of organic matter, you are slowing the rain drops before they reach the surface of the soil, greatly reducing the amount of erosion you see on your fields.

As I mentioned before, I was able to maintain a pretty decent food plot through the wicked drought we had last fall. If my memory serves me correctly, we had 76 days of no rain on my central Alabama property. The key to my success once again was organic matter. Even though we went 76 days with no rain, we still had pretty substantial dews some mornings. Having that layer of organic matter on top of my soils allowed that dew to seep down to the soil and protect the moisture from the heat throughout the day. This allowed the seed to germinate and reach about 2-4 inches in height. Even though it didn't exceed this height, it still fed the local whitetail population through that drought and attracted deer that the neighbors couldn't.

Organic matter, erosion control, weed control, and moisture retention are just a few of the many benefits of planting with a no-till method. When you are preserving your soil, you simply can't go wrong. So, ditch the disk and tiller and try no-tilling your food plots. You will not regret it.

Wildlife Trends Journal Management Calendar

By Dave Edwards

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Install new food plots and/or expand existing ones

From a landscape level, actively managing nature habitats should be one of the highest priorities for landowners desiring to enhance wildlife value of a property. Having said this, we all know the wildlife value created by dedicating land to actively managed food plots. Because all properties are unique with various habitat compositions, forest ages, diversity, timber management

strategies, agricultural practices, and management on neighboring lands it is impossible to provide a “cookie cutter” amount of acreage that should be dedicated to food plots. However, if adding more acreage in food plots is in your plans, summer is a good time to create new food plots or enhance existing plots. I personally like to plan and mark/flag areas needing clearing during winter months while leaves are off allowing me to see the area better.

Summer is a great time to create new food plots or enhance existing plots.

Another advantage of doing this during winter is there are no snakes, ticks, and chiggers to worry about! I then come back in summer to do the “dirt” work. Through years of experience, I am a big fan of using mulching machines when creating new food plots, expanding existing ones, expanding roadsides, or creating new trails. A mulching machine, also referred to as a forestry mulcher, uses a rotary drum equipped with steel chipper tools (or teeth) to

shred vegetation. Heavy duty forestry mulchers can clear up to fifteen acres of vegetation a day depending on terrain, density, and type of material. However, 5-8 acres per day is more realistic for most applications I've used them. The advantage of using a mulcher is only needing a single machine to cut, grind, and clear vegetation verses needing a dozer, backhoe and farm tractor to do the same job. Mulching is essentially a one-pass and done type process. Because the vegetation is grinded into chips there are no debris or root piles commonly associated with dozer type clearing. Another advantage is mulchers are capable of clearing land of unwanted trees and brush with limited disturbance to soils leaving more nutrient rich top soil and reducing the risk of erosion. From a location and design standpoint, I always consider soil quality, hunting stand placement, preferred

wind direction for hunting, hunter access, and obviously what the land, terrain, and habitat will allow. Where possible I try to create linear shaped food plots. Deer, particularly mature bucks, feel more comfortable and secure using linear plots which results in more sightings and harvest opportunities while hunting. Examples of this may include a "turkey foot", "V" shape, or "hub and spoke" – aka "wagon wheel" shape. When expanding existing rectangular food plots I often add linear "ears" or "fingers" that extend from the core food plot area. In this situation, deer often enter the fingers first then work their way to the more open plot. Regardless of the methods used to clear the land or the shape you design, summer is a good time to conduct this work. Doing so allows plenty of time for working and amending the soil in preparation for fall plantings.

Initiate management of beaver ponds for creating and attracting waterfowl this winter

Similar to cultivated duck ponds and green tree reservoirs equipped with water control structures, beaver ponds can be managed to produce duck food to attract waterfowl and provide great hunting opportunities. If quality mast producing trees are still alive in the beaver pond, manage the pond as a green tree reservoir – meaning apply a slow draw down before spring green-up. While most oak species can tolerate being flooded over dormant season, few do well and often die if their feet stay wet well into summer. If few quality trees exist or if trees are already dead (from constant flooding), you have a few options on management strategies. First, you could drain the pond early in the growing season (at spring green-up or very early summer) to allow natural



When properly managed, beaver ponds can provide exceptional waterfowl habitat and hunting opportunities.

wetland/moist soil plants to germinate and grow throughout the summer. Many moist soil plants produce seeds which are quality duck foods. A slower draw down over several weeks will result in a more diverse species composition of plants providing a variety of seeds/food. Another option would be to hold water on the pond until mid-summer, drain the pond, then broadcast small grains such as millets. I personally like Japanese millet because it easily germinates on mud flats with little or no site preparation, grows well in wet soils, produces an abundance of seeds, and if water is properly managed it will often reseed the following year. Planting grain in a beaver pond is relatively easy. Simply broadcast seed at the recommended seeding rate per acre onto exposed mud flats. Although fertilizing is not essential to success, it can help. As a side note, I rarely fertilize crops in beaver ponds and have had great success without it.

Now to the hard and messy part – water control. To consistently manage a

beaver pond successfully for ducks, it is necessary to drain the pond by breaking the dam and installing a drain pipe. Generally speaking, this means a pipe that extends well into the pond with many perforations to prevent beavers from patching the leak. Although it is messy, and certainly watch out for water moccasin/cottonmouth snakes, breaking a beaver dam is often not as difficult as it seems and can normally be done with a fire rake. Break the dam on the downhill side of the existing channel in the form of a narrow, deep “V”. The initial flow of water through the dam will help clear excess dam materials. Place the drain pipe deep into the break so that at least 10’ of pipe extends into the upstream area. The final level of the pond will be determined by the height of the downstream end of the pipe, or the stand pipe position height. There are many options for beaver pond drain pipes. The key is to install a pipe that is designed to prevent beavers from “patching the hole”, yet does not drain the pond completely so

that beavers remain in the pond. Always leave at least 1/3 to 1/2 of the pond area un-drained during drawdown as over-draining may cause the beavers to seek new areas. There are many homemade and fabricated designs that can be found by doing a little internet research. If you do not use a drain pipe that allows you to adjust the water level, you will need to remove the drain pipe approximately 45 days after natural moist soil plants or your planted crop germinates. This will allow beavers to patch the break in the dam resulting in the pond flooding. Using this method often requires re-breaking the dam and re-installing a drain pipe higher in the dam to maintain the desired water level. I like the Clemson Pond Leveler as it is a great and relatively permanent design that allows you to control water levels by adjusting a standpipe on the downstream side of the dam.

Monitor and control weeds in summer food plots

If you planted summer food plots



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Managing wildflower areas is a great addition to your property management strategies, particularly if one of your goals is improving habitat for turkeys and quail.

(which I hope you did), it is important to monitor weed encroachment to ensure you get the most benefit out of your food plots. If you are new to planting summer crops, you will soon become an expert at weed identification and herbicides. Just by nature of the warmer conditions and excellent growing conditions, food plot managers have a tougher weed battle to fight during the summer. There are many summer weeds that will take advantage of the lime and fertilizer you applied to the soil for your summer food plot plants. If left unattended, these weeds can, and will, take over your summer food plot resulting in less quality forage for your wildlife. Make food-plot-specific notes of the weeds you are having problems with so that you can adjust your planting the following year. For example, if you have grass type weed problems (such as Johnson grass), plant a broadleaf crop on that plot so that you can

spray grass-selective herbicide to control the problem grasses without harming your crop. Vice versa, if you have broadleaf weeds, plant grass or grain crops so that you can spray broadleaf-selective herbicides. Obviously, another option is to plant “RoundUp Ready” summer crops. Doing so allows you to apply glyphosate (RoundUp) after germination of your crop to kill all competing weeds whether they are grasses or broadleaves. While weeds are persistent, we are smarter!! Anticipating your site-specific weed problems, and planning/planting accordingly will help you make the most of your summer food plots and efforts....It is also less frustrating when you are winning the weed war!

Allow wildflowers to mature and go to seed before mowing.

Managing wildflower areas is a great addition to your property management

strategies, particularly if one of your goals is improving habitat for turkeys and quail. They not only add aesthetics which adds to your outdoor experience, but the flowers attract an abundance of bugs and insects that are eaten by turkeys and other birds. If you have planted or are managing wildflowers on your property, avoid mowing these areas until seedpods have matured. Allowing the wildflowers to produce seed before mowing will ensure adequate reseeding for a good crop the following year. If you are not currently managing wildflowers on your property, but want to do so, do your homework to determine the best wildflower blend for your particular soil and climate, begin preparing seed beds well before planting time (fall) to create a smooth firm seed bed, and plan to plant them this fall. Due to the small seed size of many wildflowers, a smooth seed bed is critical to success. Rough seed beds often result in



Warm season burning can be an exceptional tool for managing wildlife habitat.

seeds getting covered too deeply and will result in low germination rates even if broadcast by hand. Once established, and with periodic management such as mowing, wildflower areas can persist for many years.

Conduct warm season or summer prescribed burns.

Warm season burns are an exceptional tool for managing quail habitat. Warm season burns are generally conducted from June through August. However, extreme caution should be used when conducting summer burns. Due to higher ambient air temperatures and low relative humidity, summer fires can get very hot and difficult to control. If the area you plan to burn has a heavy fuel load (understory shrubs, grasses, and thatch) or has not been burned in

over 3 years, I recommend initially conducting a cool season burn (December – March) to reduce fuel loads before attempting a summer burn. Fire rotations (interval of time between burning the same area again) for summer burns vary depending on your goals and habitat types but are generally every 1-2 years to promote quality wildlife habitat. Regular warm season burns will often promote native warm season grasses that are desirable for quality quail habitat. It is also a good idea to strategically plan your burns so that you always leave some areas unburned. This will help to maintain diverse habitat types which will enhance the wildlife value of the area. Always check local burning laws and consult with an experienced burn manager before lighting a woodland fire. The U.S. Forest Service

or your state forestry commission are great sources for obtaining more information regarding burning in your area.

Identify and control invasive exotic plant species.

Exotic species are very competitive with native plants and can take over your property and compromise habitat quality. The best time to control or eradicate exotic plants is often during the growing season. Strategies to control these plants vary depending on the species at hand. However, herbicide (and fire in some cases) will likely be the tool of choice. It is much easier to control exotic species if you catch them in the early stages of colonization. Once they have a foothold, eradicating can be extremely challenging. Some of the common invasive exotics in the

Southeast include Cogongrass, Chinese tallow tree, Kudzu, Chinese Privet, Chinese Lesedeza, and many others. A great field guide to keep on hand is *Nonnative Invasive Plants of the Southern Forest* by James H. Miller. You can get this publication from the USDA Forest Service – Southern Research Station at Auburn University or visit <http://www.bugwood.org/weeds/forestexotics.html>. This guide has information regarding identifying invasive exotics as well as methods of controlling them. Another resource is the Florida Pest Plant Council - www.fleppc.org. It is also wise to consult with a professional herbicide applicator before deciding

which herbicide and method to use. Besides the complex world of herbicides themselves, mixing and applying them can sometimes be complicated as well.

Manage logging decks for wildlife habitat

If your property is in the Southeast, chances are good that you have logging decks (aka loading decks) scattered across the landscape. These are small areas/openings in the woods that are used to bunk, de-limb, cut, and load harvested trees onto logging trucks to be transported to mills. After timber harvest is complete, these areas can be managed many ways to provide addi-

tional wildlife habitat. One common strategy is to convert these openings into food plots which can be planted in a variety of forage or seed producing crops to provide an additional food source for wildlife. However, because of the annual (or seasonal) effort required to properly plant and grow quality food plots, and due to the fact that such small areas are vulnerable to over-browsing significantly reducing the amount of nutrition provided, I generally do not use them for food plots. Two of my favorite management strategies to enhance wildlife habitat on logging decks are maintaining them in early successional habitat or planting



Periodically disturbing logging decks through mowing, disking or burning will provide quality wildlife habitat.



Establishing mineral licks for deer now not only provides additional nutrients but can make excellent places to photograph deer later this summer or early fall.

them in wildflowers. Maintaining them in early successional habitat simply means periodically disturbing the area to keep the plant community young and actively growing. Common practices used include mowing, disking and burning. Of these, I prefer burning followed immediately by light disking every 2-3 years. The local soil, seed bank, climate, and timing of management will dictate the vegetative community that colonized after disturbance. However, generally speaking a multitude of early successional plants will occupy the area providing both food (browse & seeds) and cover. Once the vegetation gets 4-5 feet tall (normally 2-3 years after initial disturbance), re-apply management strategies to knock everything back and start it over. Another one of my favorite uses of logging decks is to establish them in wildflowers. After the initial soil preparation and planting, managing wildflowers is relatively easy and requires little effort. In most cases, mowing and pos-

sibly light disking is all that is required to keep wildflowers flourishing.

Plan now for late summer trail cameras - Create mineral licks

While the nutritional benefits of providing mineral licks for deer have not been well studied, they are cheap to create, deer use them, and they do not appear to have any negative nutritional effects. In fact, most deer biologists think there are nutritional benefits of providing minerals for deer. You can create a mineral lick using commercial blends of dry minerals and/or placing mineral blocks in desired locations around your property. I have had great success getting deer to use commercial mineral rocks, such as Bio-rock or Trophy Rock, throughout summer and into early fall. Using a mineral lick or salt rock is also a good way to reduce bear or hog problems commonly experienced when using corn. Deer tend to use mineral licks the heaviest from summer

through early fall. The key however, is to establish the mineral licks early in the summer to allow deer time to find them and begin using them. My experience with mineral licks has been that the longer they have been established, the better they are. Rains dissolve the minerals and saturate the stump or area they are placed. Evidently “leftover” minerals or salt that attracts them lingers and deer often come back to the same site the following year. Having said this, corn is still the “go to” attractant if you are conducting a true camera census on a property, but mineral licks offer a cheaper way to get deer in front of cameras for “casual” photographing. If your property is in a state where “baiting” with corn is illegal, and you plan to conduct a camera survey or install cameras in early fall to photograph bucks, get mineral sites established now so that deer are using them during later summer/early fall when you want to photograph them.



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