THE NEW SOUTHERN RECONSTRUCTION - HOME GROWN PRAIRIES

By Mickey and Bob Burleson

The following is a condensed version of the article written about 30 years ago by Bob and Mickey Burleson. It details some of the methods they have had success with in replicating the native Blackland Prairie on their farm in Bell County. Bob and Mickey were founding members of the Native Prairies Association of Texas.

WHAT IS THE BLACKLAND PRAIRIE?

The Blackland Prairie is an area of dark clay soils varying in width from 15 to about 50 miles, extending in a north-south direction from just east of San Antonio to the Red River in Lamar County. It is one of the most fertile and productive agricultural areas of Texas, but when European settlers first saw this area it was a climax grassland, a tallgrass prairie, with a tremendous diversity of plant life. It was among the first areas in Texas to go under the plow, because of its deep soils and high fertility. Now, the original Blackland Prairie exists only in books, and in small and widely scattered remnants, such as cemeteries, odd field corners, prairie hay meadows of old German and Czech farmers, and along railroad rights-of-way. Only a few large and reasonably unaltered segments are left. Most of these show the effects of invasion by woody plants, weeds and exotics, or the elimination of many of the original species by herbicides, excessive grazing or improper haying or burning practices.

The Grand Prairie lies just to the west and north of the Blackland Prairie, and is typified by the area between Fort Worth and Decatur. The vegetation is very similar to that of the Blackland Prairie, but the soils are generally more shallow and the rainfall averages slightly less. Both soils were derived from limestone, and the plants from one area will pretty well grow in the other. However, the Grand Prairie was more of a mid-grass prairie than a tallgrass prairie, and was more suitable for ranching than farming. There is more of the Grand Prairie left today because it was not an early victim of the plow. The Grand Prairie forms the resource base for the ranching industry from Central Texas to near Wichita Falls, excluding the sandy soils of the Cross Timbers region.

WHAT IS A PRAIRIE REPLICATION?

Replicating a prairie simply means duplicating or recreating it in as nearly a natural form as possible. Obviously it is not possible for us to do in a few years what it took nature tens of thousands of years to do, but we have found that by hard work and study we can plant and grow acceptable “prairies” that we hope eventually will develop again into the climax grasslands that so amazed the early travelers through this region of Texas.

WHAT ARE THE BASICS THAT ARE NEEDED FOR PRAIRIE REPLICATION?

We consider the following to be essential items:

(a) Land, preferably five or more acres that can be permanently devoted to this use. We started with a tract of 100 acres out of a much larger farm, about 40 acres of which was “worn out”—land not suitable any longer for row crops. We devoted this land to the prairie project, and later expanded into the better land as

we could afford to take it out of row crop production. Prairies can be created on smaller plots, including yards and "pocket prairies", but it is better to have several acres so that you can create a full plant and animal community—strong enough to resist invading brush, exotic weeds and grasses. A tract of 500 to 1,000 acres or more would be great, but out of the reach of many.

(b) Time to collect seeds from roadsides and native prairie remnants in your area. We worked nearly every weekend for a year to collect the several hundred pounds of native wildflowers, forbs and grass seeds that we used in our first plantings—it was nearly all collected by hand. Later, we built pull-along seed strippers and modified a small pull-along combine, to speed up the seed harvest.

(c) A small tractor and shredder, or access to one, to mow and control competitive weed growth during the first two years of the project. It is not essential in all cases to mow to control the competition, but it speeds the establishment of a good stand better than anything else, and when you work hard for seed, you don't want to waste any of it in competition with weeds.

(d) Rain and good luck! Almost everything else can be improvised, rented or borrowed. The true cost of anything is the amount of your time that you must exchange in order to obtain it. Prairie replication can be expensive with respect to time, and there is no point in getting involved unless you are willing to see it through to the end. It usually takes at least two years, sometimes four or five, to see your labors bear fruit when you are dealing with native grasses and forbs. You will not know what or when to collect at first, and will not know what you are looking at.

At the beginning you should explore existing remnant prairies. Start with the first plants of spring, and notice what comes up, what they look like in the early stages, when and how they flower and bear fruit. Educate yourself as you go, to know which plants "belong" and which do not. Concentrate on perennial species, not just the annuals. By spending time in prairies, you will get a feel for the total plant community , and then, as you see members of this community blooming on roadsides and in waste places, you can add to your inventory of seed sources. No degree in botany is required. Many books and resources are available to help you become familiar with the native prairie plants of your area.

PLANNING YOUR PRAIRIE SITE

Most folks interested in restoration decide that it would be a good experience to create a prairie on a tract of land, large or small, that is already owned. Although this will work, the ideal method would be to make the decision and then look for land that is suitable. Replicated prairies can range in size from an urban garden to hundreds of acres—even small projects can help foster a greater appreciation of nature. We are not trying to discourage anyone from attempting prairie replication. Nor are we trying to discourage anyone from trying to improve or restore their existing grasslands or pastures. However, it probably does help if you have an "ideal" tract in mind from the start. If you are serious about prairie replication, here's the "ideal":

(1) A tract of 50 to 100 acres, or as much more as you can afford. Larger tracts seem to be able to sustain themselves as an ecosystem better than small tracts, although there are many variables involved. A 1,000-acre prairie is a rare beauty!

(2) Level to gently rolling land is best, free from terraces, eroded ditches, streams or woods.

(3) Fertile soil, suitable for growing crops. Deep soil is best. Very shallow, rocky soil is problematic.

(4) Land that has been in crop production and is generally free from strong competitors. You should look at the history and past uses of your proposed tract, as weed seed can remain viable for many years.

(5) Land that does not currently border a pasture or roadside where Bermudagrass or King Ranch Bluestem grows. There is no point in setting up right next to strong competitors. Since most public roadsides are full of KR Bluestem, you may wish to avoid them to the extent that you can.

(6) Avoid low, very wet, heavy clay soils, if you have any choice. Such soils are subject to invasion by many tough competitors. Higher, better-drained soils seem to be best.

(7) Since you may be burning every few years, it is best not to locate right next to rural home sites, as this can create neighbor problems.

By now, you may wonder if there really is any "ideal" site for a prairie replication, in light of all the above requirements. The truth is that such lands, generally open farmland, are plentiful, probably cheaper, and readily available not far from most cities. The tracts with creeks, trees and hills are the first to be purchased by urbanites wanting to move to the country, and generally bring the higher prices. If your land is not ideal, then you need to consider making it more ideal before you plant. Take down perimeter fences, doze out trees and brush, level all terraces, fill in all gullies, and sculpt the land so that you can safely and easily disc and shred it during your project.

COLLECTING AND STORING SEEDS OF NATIVE PLANTS

The seeds of grasses are often treated differently from those of the forbs (wildflowers and legumes) so we will discuss each separately.

(1) Forbs. These plants flower and bear fruit at three main seasons of the year. The cool-season forbs usually grow as a winter rosette, and flower in early spring and set seed in late spring. Then, a second group of flowering plants appears and blooms on into summer, setting seed in mid-to-late summer. Finally, there are a number of prairie plants that slowly grow from spring to fall, bloom and set seed in the fall. You have three main collecting seasons, around May, July, and October. These are good "rule of thumb" months for collecting seed of wildflowers in Central Texas. Blooming time and seed set is variable, according to rainfall, etc., but you can usually collect seed from early May through frost, with peaks in the months mentioned.

Most wildflower seeds go through stages of maturity. The "hard dough" stage is when the inside of the seed is firm and mature—usually white or tan in color from stored starches. You are wasting your time to collect seed before it reaches this stage. Native plant seeds usually mature rapidly, so keep an eye on them. You can collect good seed several days before the flower head finally dries up and shatters. (Many prairie flowers are showy when in bloom, but become almost invisible when the petals drop. Keep notes of the location of these plants, and mark them to help locate them after the petals fall.) The way to recognize seed "ripeness" is to start with the plants in full flower, occasionally pluck a flower or seed head and check it. Use a magnifying glass and a penknife or your thumbnail to see what stage of development it is in. After some experience you should be able to tell from external signs alone whether the seed is mature or not.

As you collect your seeds, dry them thoroughly. We usually dry them in paper sacks, or shallow, open boxes on a shelf in a well-ventilated area. Don't pack them in the sack, and keep the layers shallow. Moisture and excessive heat are harmful to the life of the seed. After the seeds are dry, they can be combined in larger

“breathable” paper bags for storage. A closet-sized moth crystal block can be placed in the larger bags to control insects. Since you are planting a mixed prairie, there is no need to separate the seeds or clean them.

A good rule is to plant all wildflower and forb seeds in the fall of the year. October is a great time—even if they do not germinate until spring. Most of these seeds benefit from shallow planting, not more than one-half to three-fourths of an inch deep. If you mix them with grass seed and plant with a drill with depth bands on the discs, you will get a good stand even if they are planted a bit deeper. But deeper than one inch is wasting your time and seed.

(2) Grasses. The main prairie grasses are big bluestem, little bluestem, Indiangrass, sideoats grama, and switchgrass. Eastern gammagrass and prairie cordgrass are wet-site species that are best planted vegetatively rather than by seed. There are many other grasses that form the tallgrass and mid-grass prairie communities, but the ones listed above will be the most common in your native stands. Most grasses flower in the early fall, taking advantage of the September rains to bear fruit. In dry years, moisture stress will cause them to flower earlier, but in normal rainfall years you can find the prairie grasses in full flower in October, with seed maturing from late October to mid-November. Big and little bluestem turn reddish when mature Indiangrass and switchgrass turn gold or yellow at maturity. Just as with the forbs, start watching the grasses when they send up a flowering stalk or culm. Grasses “bloom” much like wildflowers, with flower parts extruding from the florets. Inspect them as they mature—you will find that the seeds of grasses go through the same stages as the forbs. To get good germination, wait until the majority of seeds are in the hard dough stage before you start harvesting. Prairie grasses shatter soon after full seed head maturity, but not as quickly as most wildflowers, so you usually have several weeks of collecting time on the grasses—barring a severe storm or other shattering event.

When the stand is mature, your methods of harvesting, storing and planting grasses depends on the size of your project, the amount of available grass seed, your equipment, and the time you have. If you have a small project—perhaps an acre or less—you can hand-strip enough seed to get a start. Strip the ripe seed heads into sacks, collecting as much as you can. There will be more bulk and trash than seed, so don’t be overly impressed with your efforts. You will have collected about a tenth of what you actually need! Seed set is often erratic in native stands, and you need lots of bulk for the sake of a few good seeds. If you don’t plant it at once, dry it as you did with the forbs.

If you have a big project, harvest seed with a seed stripper, a combine or by curing seed hay. The method of harvest determines what you do with the seed, how you treat it, and when you plant it.

If you cut seed hay, have a previously prepared seedbed ready that has been repeatedly disked and harrowed to kill sprouting weeds, and the ground broken up to create a soil mulch. Use a sickle-type mower to cut the hay in swaths and lay it gently down. Don’t crimp it, or you will shatter the seeds. Cut it early in the morning when the grass is damp, so that you shatter as little seed as possible. With a hay rake, such as a side-delivery rake, windrow the seed hay. It can then be baled, or forked into a grain trailer as bulk hay. Transport it to the planting site. Pitchfork it out of the moving trailer towed at a slow rate of speed, covering the field as evenly as you can. Toss forkfuls of seed into the air to get help from the wind. Finally, roll, cultipack, harrow or use a brush drag made of tree branches to mix the seed hay with the mulched soil and get the seeds somewhat covered with earth or hay.

This is all done in the fall, contemporaneous with the harvest. There is no need to dry the seed if you plant it the same day you strip it. Good stands can be obtained this way if you cut the hay at the right stage and get enough of it. As a bonus, you will get surprising amounts of wildflower seed in the hay.

If you use a seed stripper, you are also collecting bulky and trashy seed. Your technique is just the same as with seed hay, and you follow all the above steps. If you use a combine, such as an ordinary grain combine, you will be getting a mixture of seed and finely chopped chaff. This mixture can be planted using grass drills. It should be carefully spread to dry, in a shallow layer, turned regularly, and kept dry until planting time in January or February. It is then drilled into a prepared seedbed, which has been created by repeated disking and harrowing during the winter, and allowed to settle under rainfall.

When storing grass seed, it is a good idea to store it in bulk, rather than sacking it up. Rodents are less attracted to bulk grass seed than to sacked grass seed. We use flatbed grain trailers under rainproof sheds to dry and store seed. If your combine is properly adjusted, you can usually get seed clean enough to plant.

For planting with an ordinary seed drill, the seed needs to be as clean as possible, in order to minimize stopping up the spouts. The seeds drop by gravity down the spouts and into the small furrow opened up by the rolling disc opener. You can clean your seed to remove some of the larger stems and leaves manually by making a “scalper” out of one-fourth inch or one-third inch hardware screen, mounted on a wooden frame. Scalp the dry seed through the screen onto a tarp below. This technique can be used to clean small lots of dry seed hay. You can devise motorized, shaking scalpers for larger lots and more complex projects.

PLANTING DEVICES FOR PRAIRIE GRASSES

Planting devices range from expensive grass drills with double disc furrow openers, to shop-made planters with cotton planter boxes, to the old-type pelletized fertilizer spreaders. Under certain conditions, any of these devices can give a good stand.

(a) Grass drills. There are several manufacturers of double-disc pasture- and range- seed drills. These usually have a row of boxes for chaffy grass seeds, and a row of smaller boxes for small, clean seed. Implement dealers or your NRCS range conservationists can give you addresses. Some soil conservation districts have these machines for rent to cooperators, and you can probably find one in your area by inquiry with the local soil conservation work unit.

(b) Fertilizer spreaders. The old-style fertilizer spreader, with the long box and an agitator in the bottom, putting out fertilizer in a broad swath at right angles to the tractor’s long axis is useful in planting trashy seed. Once the seed is spread on the ground by the spreader, some sort of following treatment is needed to cover the seed lightly. You can roll it with a cultipacker to press it into the ground, or harrow it lightly with a toothed harrow, or drag it with a brush drag.

(c) The shop-made planter. A handyman with access to a welder can build a great homemade seed drill. Use a two-row cotton planter, with cotton plates, and rig it on a triangular pipe frame to run on two auto tires that roll directly over the freshly planted seed as packer wheels. Instead of the usual plow for a furrow opener, adapt two double disc openers from a grain drill. The whole rig tows behind the tractor like a little trailer, and the cotton planter boxes will plant any kind of dirty seed, no matter how much trash is in it.

(d) The pitchfork. As indicated above with seed hay and stripped seed, you can get good stands by just

forking the seed and hay out onto prepared ground, and then dragging a harrow or homemade brush drag over it to lightly cover the seeds.

SEEDBED PREPARATION

Native grasses and forbs are hardy, designed by nature to colonize and spread. Thus, it is not absolutely essential to plant them on a prepared seedbed unless your project is partially financed by the government—which requires seedbed preparation and fertilization. We have had slow but sure success by planting into stubble from a prior crop, by planting into dormant Johnsongrass, by burning and planting into the burnt stubble, and by simply forking seed or seed hay out onto whatever was growing there at the time. But, the quickest and most reliable way to get a stand is to plant into a clean, firm seedbed. Normally, a seedbed is prepared by chiseling the area, disking it, and allowing rain to fall on it to firm it up and break down clods before planting. Do this in the winter, not long before you intend to plant, because annual weeds will soon sprout. An alternative would be to prepare the seedbed early, let the annuals sprout, then hit them with Roundup or a very shallow disking several weeks before you intend to plant. Roundup should not be used immediately before planting or during planting, because of potential damage to your seedlings.

An ideal seedbed is clean and free of weed growth, free of large clods and relatively level. If there are old terraces on the plot, it is best to plow them down or flatten them with a bulldozer before preparing the seedbed, as you will always have trouble with weedy growth in the dips behind the terraces and on the tops. The firmer the seedbed, the better, as ultra-loose soil causes seeds to be buried too deeply and tends to insulate the seed from the moisture below it, delaying germination. Plan to plant in January or February. The sooner you can get your seedlings established, the stronger they will be when Johnsongrass comes on in April and May. And they will make of better use of moisture and moderate spring temperatures.

IMPORTANCE OF A VARIED GENE POOL AND OF ADAPTED SEEDS

When selecting your seed, try to get seed of the same species from as many different remnants in your area as you can find. There is substantial genetic variability among, for example, big bluestem plants from meadows a few miles apart. Because all these prairie remnants are threatened with destruction, and because we need to preserve as much variety as possible in the gene pool of each species, you will be helping the plants and helping your prairie by gathering seed from many nearby sources, rather than from a single source. Someday your replicated prairie may be the only remaining example of the genetic variability and adaptability originally found all over your part of the state.

Try to avoid commercial seed sources, unless you check them out well and unless you know the geographic origin of your seed. You can go into any feed store and buy prairie grass seed, but it may come from the Texas Panhandle or Oklahoma. Because of many factors, including temperature, photoperiod, etc., prairie plants do not do well when moved a long distance from their point of origin. Try to always use local seed sources. A good rule of thumb is that prairie seeds should not be planted more than about 100 miles north or sound nor more than about 75 miles east or west of their point of origin. Big bluestem from the coastal prairie or the Panhandle is just not the same as big bluestem from Central Texas, even though the species name is the same, and the plants look the same. Always know where your seed comes from!

CARE OF THE SEEDLINGS

Native plants are hardy. They can handle most weedy competition and dry weather if given a small amount of help. The best help you can give them is to mow to a height of between six and eight inches about four or five times during the first two growing seasons. This will cut down competition and reduce shading by taller weeds and grasses. If you mow during the first two years, plant only perennials, adding annual wildflowers by over-planting after the perennials have become well established. Most of the better prairie plants are perennials, so you are going to have a nice variety. Annuals such as basketflower—an important prairie forb—will fit right in later on without difficulty.

Avoid grazing and burning for the first two years. If you intend to graze your prairie, remember that continued close grazing during the growing season will eventually wipe out your tall grasses and forbs unless you give your prairie regular rest periods during the main growing season. It takes good management to maintain a small prairie by grazing livestock. Prairie plants grow down for the first year, and are very cautious about putting up lots of top growth until they have deep roots to sustain them. You will see much more growth the second year, and after that, your prairie can hopefully take care of itself.

HERBICIDES

We do not advise the use of herbicides in seedbed preparation, with the sole exception of Roundup applied to winter weeds several weeks before planting. Most herbicides have residual effects that may last more than one growing season, and may retard the germination or early growth of prairie plants. Herbicides, used very carefully and applied by spot sprayer or hand wick, can be used to control weedy or woody invaders in a prairie, but almost always some damage or kill of desirable plants is experienced. Broadcast spraying herbicides can really do harm to your prairie, so use herbicides with great care, usually by spot spray or wick application only.

CONTROL OF EXOTIC AND WOODY PLANTS, AND MANAGEMENT PRACTICES

Once you have a prairie growing and doing well, it requires some management to keep it from being invaded or damaged. The woody invaders must be controlled. It is better to seek them out and control them while they are few, young and small. Temporary control can be gained by hand-clipping with pruning shears. Do this every year, in late spring or early summer, when the woody growth is not obscured by the taller grasses. Shredding or haying will also retard the growth of woody invaders, but it does not totally eliminate them. Burning the prairie every two or three years will usually kill the smaller saplings, but burning too frequently or at the wrong season can be harmful to the prairie. Poison ivy usually requires the use of a spot spraying or a handwick and Roundup, to kill it by wiping the herbicide on the leaves. You will always kill a few non-target plants also, so be careful. Johnson grass is a tough invader. It can be retarded by mowing at first, but occasionally you must hit it with a wick (hand or tractor mounted) and Roundup. It is usually growing above the prairie grasses in late spring and early summer, and can be hit with the wick without doing much damage to the prairie plants, if you are very careful! Grazing on a continuous basis is fatal to prairies. That is why you do not see the better prairie plants in fenced cow lots in the Blackland Prairie. Continuous heavy grazing under fence will give you a pasture of common Bermuda, buffalo grass and

broomweed, if continued for any length of time. We prefer to graze prairie plantings lightly, in the dormant season (October through March), and to watch the impact pretty closely. Light spring grazing is also o.k., but only on an every-other-year basis. Horses normally do more damage than cattle, and sheep and goats are notorious for their damage to prairie plantings. In general, you should regard grazing as a means of management, rather than an end in itself, and grazing should be stopped if damage is ensuing. The tracking of livestock in a wet prairie will nearly always encourage the growth of weedy species in the tracks, and the manure patties are ideal germinating spots for other weeds. Mowing is a good way to control annual weeds that are getting out of control. Let them grow through May, or early June, but not to the point of flowering or setting seed, and then mow them back. Many will not regenerate, but some will, depending on the rainfall and temperature and the state of maturity at the time of mowing. By mowing, however, you may harm some of the prairie annuals, so watch them and try to mow after the better ones have matured their seed. Do not "scalp" the prairie! Mow no lower than about 6" off the ground. Try to keep tractors and mowers out of wet, soggy prairies, because their weight tends to compact the soil too much. Haying each year is common in prairies. Continued haying will eventually alter species composition in some degree, but normally it is an accepted tool in prairie management. It does help keep down woody and weedy growth, and tends to favor the grasses above the forbs. Cutting more than one crop of hay per year is not a good practice. Cut hay early, no later than the first week of July. This leaves time for the plants to grow and build up their necessary food reserves for setting seed, for winter and the following year. Hay bales should not be allowed to sit in the prairie, but should be moved at once. A bale, or even a broken bale, if left in one spot for a week or so, will kill the prairie plants under it. Round bales should be removed from the prairie plot for storage. Stacking bales or storing round bales on prairie sod will kill the prairie plants under the haystack and result in weedy invasion. Haying involves the use of tractors, mowers, trucks and trailers in the prairie. Avoid the impact of heavy equipment as much as you can, as prairie soil is relatively loose and aerated and can be compacted easily. Controlled burning is a valuable management tool. It helps remove accumulated duff, renews the vigor of the prairie plants, kills small woody saplings and helps favor the grasses as against aggressive invaders like goldenrod. However, burning at the wrong season or too often can harm the prairie. We try to burn in December through February, at a time when there is adequate soil moisture to protect the roots and crown of the plants. Burning later hurts many of the early plants. Summer burns, during drought conditions, can do permanent harm to the prairie plants, although it may give a better kill on woody brush species. The techniques of controlled burns are beyond the scope of this discussion. Call us if you need advice. In general, we mow a firebreak around the prairie, usually about 40' wide, and then mow the prairie up into blocks, with mowed strips between them, giving you a better chance to maintain control. We usually start at a downwind edge, usually a corner, with firebreaks going down each side from the corner, and burn with a backfire, against the wind, under strict control by fire flappers, sprayers, and backpack sprayers, until a safe perimeter strip is burned. If you start your backfire in the mowed strip, it will not be as likely to get away from you. Once the firebreak is burned all across the downwind area and up the sides, then you can start setting narrow strips of downwind fires to burn down to the firebreak. Use narrow strips at first, as prairie fires can jump long distances with a strong wind. Use common sense. Advise your neighbors of the burn, call the local fire department to advise them of a controlled burn, comply with any state or local burning ordinances, and try to avoid burning on excessively

windy days. Have enough manpower on hand to control the fire and provide support. Wear a mask and protective clothing, and avoid getting trapped or having your pets or equipment trapped by the prairie fire. Burning a prairie annually is not required, and may be harmful. We try to burn at intervals of 2 to 3 years. To maintain the bird, reptile and small mammal population, burn only part of your prairie in any one year.

FURTHER THOUGHTS ON CONTROL OF WOODY AND WEEDY INVADERS

All of nature is dynamic, and change is the order of the day. There is no really "stable" ecosystem if you look closely enough. In all of them you will find species changes over time, as one species out-competes another for a niche, or as climatic variables such as drought, flood, temperature, etc. manifest themselves. Prairie plants are generally hardy, deep-rooted, tolerant to drought, heat and cold, and can reproduce and maintain themselves over the years, but only under "natural" conditions. Natural conditions of the prairies included regular wildfires that swept across them, sometimes annually, or at longer intervals, set by lightning strikes or by the hands of early humans. Wildfires helped maintain the prairies from takeover by their ultimate enemy, woody plants. Frequent fires favor the grasses and forbs of the prairies, to the detriment of woody invaders like trees and shrubs. However, for the past 150 years or more, fire has been treated as an enemy and has been avoided, suppressed or controlled everywhere. Thus, woody invaders have surrounded our prairies and are ever encroaching from all sides. Whereas, in earlier times, wildfires would burn, sometimes for days, over miles of prairie, burning hundreds of thousands of acres, killing or setting back all woody species, until ultimately stopped by a belt of woods , a big creek or a river bottom, now most prairie remnants are not burned at all, and woody invaders have no natural checks to operate on them. So, we must help prairies maintain themselves, by a constant battle against woody and weedy invaders. Weedy invaders, many of them foreign to North America but now fully naturalized and at home here, are also a threat to your prairie project. We must help the prairies by fighting weeds as well as woody species. Remember, in the absence of regular fires, the natural progression of plant succession is from grassland to woodland, and your prairie will become a woods unless you regularly fight to maintain it. Cutting hay yearly, or mowing at least yearly, will set back woody saplings and retard their efforts to spread, but they are very persistent and will continue to live and grow even very close to the ground. Fire will kill some species, and severely set back all woody species, so regular burnings are the best treatment method. However, around the edges, gullies, fences and rough spots, mowing and shredding will not reach the woody saplings. Many, such as wild plum, not only reproduce by seed but by underground sprouts, so that dense, ever-spreading thickets form. Poison ivy, one of the toughest woody invaders, spreads by both seeds (carried by birds, who consume the waxy coatings on the fruit) and by long-reaching underground stems, making a dense, ever-spreading clump. Goldenrod, KR Bluestem, Max Sunflower, and many others spread and clone out the same way, gradually increasing their circles of dominance year by year, unless you kill them regularly. During the first year of prairie plantings one of the worst competitors is Texas croton, dense and low-growing. So, what steps can you take to keep your prairie from being adversely affected by weedy and woody invaders?

Consider these:

(1) From the start, plan your prairie to discourage such pests. Avoid fencing, trees, woods, gullies or rough, rocky spots that harbor invaders and give them refuge from fire or shredder. Before your first

planting, disc the soil several times, after giving weed seeds a chance to sprout.

(2) Inspect your prairie regularly, on foot or by ATV, looking for the very first evidence of weedy species or young trees, vines or woody pests. Kill them then and there, by digging them up, treating them with diesel fuel, spraying or wiping with Roundup herbicide, or spot-spraying with a herbicide-water mix containing Grazon P+D, Remedy or Surmount. If you inspect regularly, spot-kill the invaders regularly, you use only very tiny amounts of herbicide and do no general harm to the prairie plants. Herbicides can kill or burn prairie plants, but if you are inspecting regularly and acting while the invaders are young and vulnerable, your spraying will never adversely affect the prairie planting as a whole.

(3) Never let a year go by without inspection, spot-killing, shredding or burning, or a combination thereof. In one year some saplings can spread and put down an extensive root system, and be much harder to kill the second or third year.

(4) Remember the value of inspection and knowing your plants. By inspecting and "working" your prairie yearly, or more frequently, you will soon know all the plants at various stages of growth and become a much better practical naturalist.

(5) Do not be afraid of herbicides. Broadcast spraying can ruin a prairie, but spot-spraying is required to save it from woody and weedy invaders. Use them according to the label. Some require a permit and education. However, at the low levels of use you will engage in, you can usually buy them at a lawn and garden center in small quantities and have no problems. Study them and their labels carefully. Avoid contamination of clothing, eyes, skin, equipment, or the environment. Most are not suitable for use in wetlands or near watercourses or ponds. Never spot-spray on a day with strong winds, as minute droplets can be carried by the wind to non-target plants. Use a coarse spray, not a fine mist, as this reduces drift.

(6) On very aggressive plants like Max sunflower, goldenrod, poison ivy, dewberry, mustang grape, and others that sprawl out or spread vegetatively, you need to spray them around the edges every year, to retard their clumps. Keep them under a maximum diameter of three feet, or they will soon get out of hand. Poison Ivy, dewberry, wild plum, goldenrod, rough-leaf dogwood, sumac, mustang grape and other very aggressive plants should be totally eradicated each year.

(7) If you are stuck with fences, gullies, treelines and other places or structures that harbor invaders, you must patrol these areas with a spot sprayer at least annually, with Roundup in the sprayer, knocking back all the invaders. If you do not do this, you will eventually find the edges moving out into your prairie year by year, like a pursestring draws together the top of a bag.

(8) Burn at regular intervals, if at all possible. If you cannot burn, then shred annually, and supplement by spraying the invaders you cannot reach with a shredder.

(9) Eventually, there is an end to spraying. As your prairie becomes a dense growth and fully mature, seedlings have a hard time establishing themselves, and burning will almost totally control the invading species. Fence and tree lines are never safe to ignore, but your activities along the edges will be limited, if you fight hard the first few years to prevent invasion and then shred and burn regularly.

(10) On burning, we prefer to burn between December and February. A March burn will work o.k. sometimes, but some plants are already greening up by then. Burning in the summer is sometimes done on rangelands, or on very large natural prairies, but we tend to favor burning in the season of dormancy of a

majority of the prairie plants. Opinions differ as to when it is best to burn, but we've been burning since 1969 and have a pretty good record in the Blackland Prairie for both successful burns and safe ones. Burning every other year is not too frequent, but many burn only every third year. You can alternate blocks of land and burn something every year if you desire, and leaving some unburned blocks each year will keep your small animal and bird populations healthy. However, we frequently "let it all burn" and have found that the small animals and birds are well-adapted to burns and to survival in the face of a prairie fire.