

# Guidelines for Planting Herbaceous Species for Wildlife

Habitat Extension Bulletin

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*Pronghorns are fond of succulent forbs in the spring and summer, especially in dry years when water is at a premium. The vegetation on typical pronghorn range includes ten to 30 percent forbs and 40 to 60 percent grass.*

*This publication introduces some general guidelines for planting herbaceous plant species that will aid in increasing or maintaining adequate populations of wildlife for hunting or viewing enjoyment. Emphasis is on plantings that will benefit upland birds and waterfowl.*

To successfully establish herbaceous species for wildlife, a simple plan is extremely helpful. The plan should include a diagram or diagrams of the plantings to illustrate their location, size and shape. A list of wildlife species desired and their habitat needs will facilitate planning and plant species selection. The length of time the project will be in place and equipment and amount of money available should be estimated to aid in planning the project. The plan should also consider weed and pest control, water requirements, fertilization and species of wildlife most affected.

Checking local seed availability is very important because the demands for seed from the

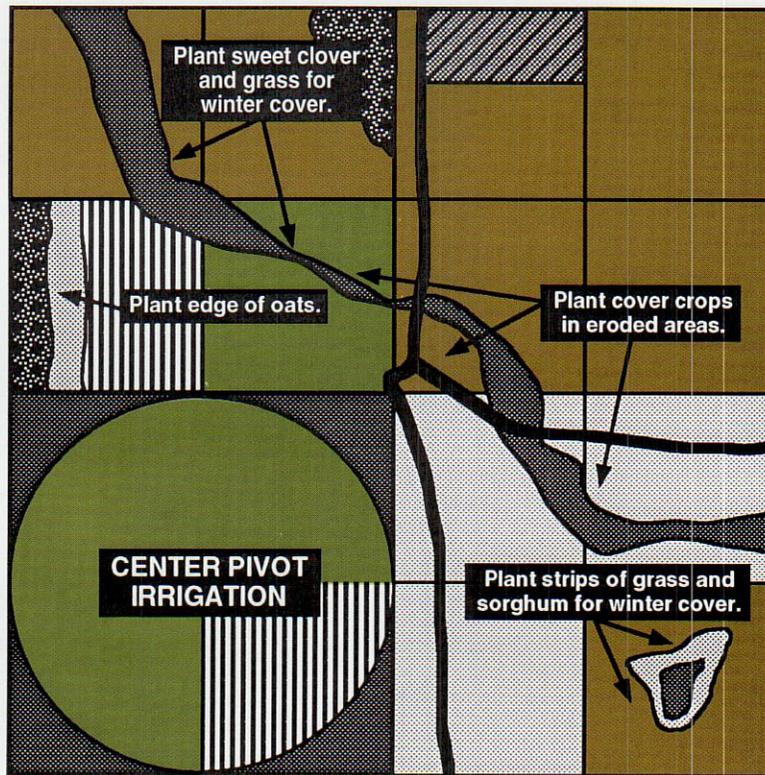
Conservation Reserve Program (CRP) have made some of the most desirable species expensive or unavailable for most of the year. Forb seeds can be difficult to find and generally are much more expensive than grasses. You likely will find that forbs have lower germination rates and are more difficult to establish.

Many areas being considered for habitat planting will be small or waste areas that do not lend themselves to large-scale agriculture. Since many of these areas are often saline, alkaline, poorly watered or prone to flooding, a list of herbaceous species tolerances to these factors is available from High Plains Grassland Experiment Station in Cheyenne, a county agricultural extension agent, or many local nurseries.

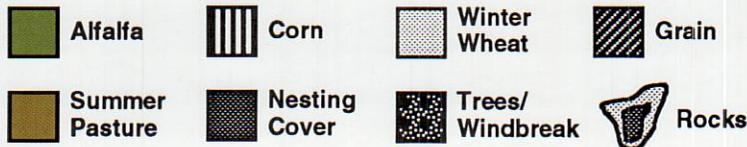
Patience is needed in the arid West when attempting to establish perennial grasses and forbs. Annual grasses and weeds seem to always have the upper hand, and it is often two to three

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**Diagram of Planned Plantings**



years before satisfactory results are seen, so be careful not to replant too soon. Use of nitrogen fertilizer is discouraged during the first year as it will cause excessive weed growth and can do more harm than good. Under true rangeland conditions, food for wildlife, rather than cover, is often the most critical factor. Range reseeding has been given credit for upland bird increases, when in reality it is due to increased production of annual, seed-producing weeds following soil disturbance (George 1984).

Annual food and cover plots are commonly planted for short-term results while waiting for permanent cover to become established. In Wyoming, some good annual cover crops are sorghum, millet, milo as well as most of the other cereal grains. Legumes, along with warm and cool-season grasses, are the three groups of perennial herbaceous plants commonly planted for wildlife habitat. Legumes and cool-season grasses are cheaper, more available and easier to establish than are warm season grasses. Warm-season grasses do well in areas with late summer precipitation because they begin growth later in the year.

Under rangeland conditions, reseeding is difficult and expensive and is only recommended

when existing desirable plants make up less than ten to 15 percent of the vegetation. Changing grazing management alone can improve rangeland condition faster and cheaper than reseeding (Welch and Haferkamp 1981).

#### **Species Selection Criteria**

When designing a seeding plan, consider five points: climate, soils, use, management and ease of establishment. Doing so will help assure the success of the planting.

#### *Climate*

If a species is not adapted to your local climate, establishment will be difficult and production low. It is important to research local sources of seed before designing seed mixtures. Range reseeding where precipitation is less than 12 inches is difficult at best, and only those species with a proven ability to establish themselves under such conditions should be considered. Species that have been successfully seeded in this lower precipitation zone include bluebunch wheatgrass, Indian ricegrass, Russian wild rye, sweet clover, western wheatgrass, thickspike wheatgrass, basin wild rye and beardless wild rye.

### Soils

Establishing seedlings on soils with high clay or high sand content is quite difficult. Many sites in Wyoming are saline and/or alkaline, and while some species are tolerant of these conditions, the soil should be tested to determine the extent of the condition. Special soil treatments may be necessary before seeding with salt-tolerant grasses such as western wheatgrass or tall wheatgrass. In saline soils, seeding rates should be doubled since much of the seed will not survive. The only grasses commercially available with proven success in Wyoming for very saline sites are beardless wild-rye, tall wheatgrass and altai wild rye. Beardless wild rye is one of the most salt-tolerant native forage grasses in Wyoming and should be included in mixtures for saline areas. This grass will spread into adjacent, very saline soils even if seedlings fail in portions of the site. Tall fescue and basin wild rye should also be successful on some of these harsher soils. When planting in harsh soil conditions, contact the Soil Conservation Service (SCS) for technical assistance.

### Use

Decide whether the seeding will be used for wildlife food plots, upland game nesting/winter cover or big game habitat. Design mixtures to obtain maximum benefits for the use selected. For instance, if winter pheasant cover is desired, plant species that will not be crushed under the weight of snow close to food plots. If the intent is to attract waterfowl to row crops, rows should be spread to allow full seed growth and allow the birds to move easily through the rows, since crop quantity is not as important as access to it. Weed pockets along field borders and ditches will not lower crop production enough to economically justify cultivation and spraying with herbicides. Annual weeds like kochia, sunflowers and clover attract wildlife and, if monitored closely, can be contained in areas where the increase in wildlife habitat offsets crop production loss. These pockets can also be transformed to plantings of preferred species for nesting cover or food plots. Avoid planting legumes next to roads to reduce deer and antelope mortality.

### Management of Stands

Unless fields or rangelands are grazed, they will need some management help. Legume fields need to be periodically rejuvenated by removing old residual material. Burning and deep chiseling or shredding with a gyromower in the early spring will increase stand productivity and vigor. Some tall and warm-season grasses need to be burned every five to seven years in the early spring to restore stand vigor, and sod-forming grasses may need almost complete restoration through tillage methods as the plants become sod bound. Rotated burns on mixed grass-legume stands can provide diversity because legumes tend to produce better than grasses in the first years after burning. Intensive grazing once every five years can also be used at times to rejuvenate a stand of tall grasses and legumes.

### Ease of Establishment

Seeding technique and adequate equipment are critical in areas of low precipitation and when small seed is planted. Seed salesmen have information for seeding difficult plants. Species that are hard to establish in fertile, deep soils will be almost impossible to start on dry, poorly developed soils. Figure 1 compares the ease of establishment of some commonly planted species. Even species adapted to the same climate may require different amounts of nutrients, light and water. Under upland conditions, a rule of thumb for planting wheatgrasses is to use 12- to 14-inch rows and 21- to 24-inch rows for wild ryes. Nurse crops in dry, upland conditions will generally out-compete grasses and without good precipitation, may hinder a seeding (SCS 1986).

### Tillage

Cropland should be tilled as late in the spring as possible to retain wildlife benefits that are usually absent in neighboring areas. Clean, tilled, fall-plowed fields do not benefit wildlife through the winter. Spring plowing is recommended as crop stubble will catch snow and provide winter food and cover. Drilling into the stubble mulch is cheaper than plowing and offers advantages such as trapping moisture, protecting seedlings from

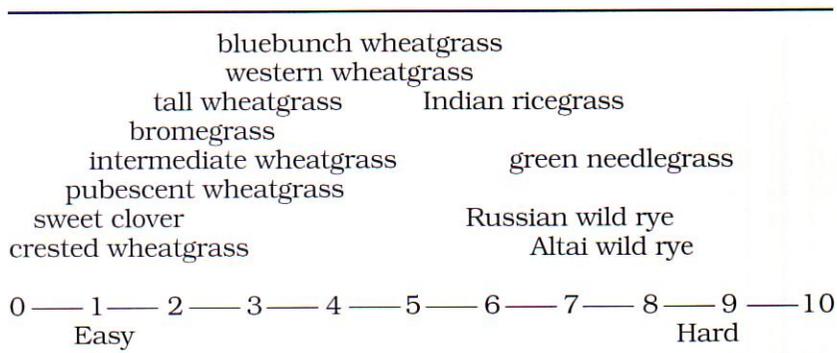


Figure 1. Ease of establishment for some common grass species.

wind and sun and providing erosion control. Many different conservation tillage methods can be adapted for use in Wyoming with the help of the SCS.

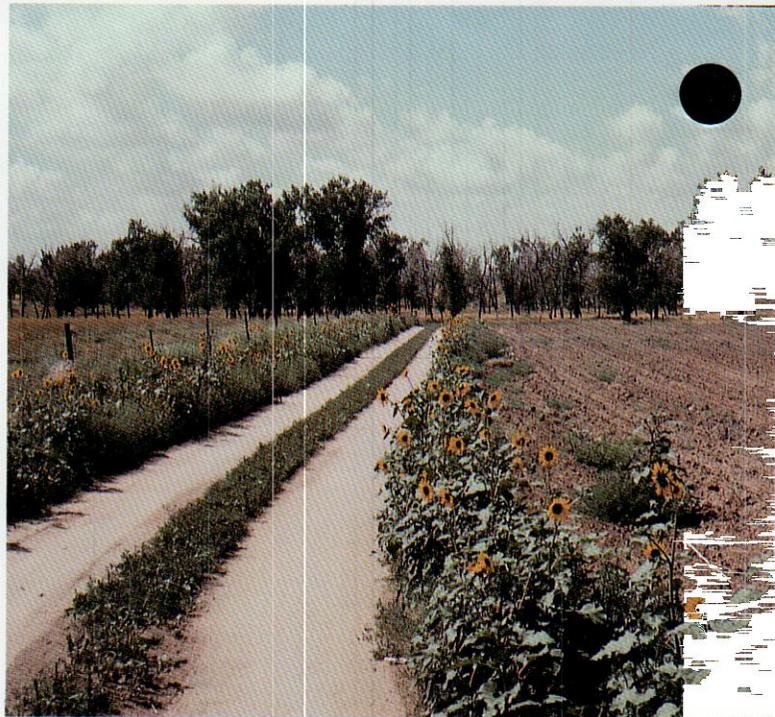
Dry, upland sites must be summer fallowed (free of vegetation) for at least one growing season before planting. Areas that contain noxious weeds such as bindweed or thistle may be sprayed with herbicides in combination with fallowing to ensure their eradication. Summer fallowing will remove food and water competition for seedlings, conserve soil moisture and prepare a good seedbed. Good wildlife habitat includes many forbs and weed control after planting would eliminate this key wildlife component so it is wise to eliminate noxious weeds before planting.

Shallow tillage in early spring prior to seeding is the second alternative to summer fallowing. A firm seedbed is essential for perennials. If the seedbed is tilled immediately before planting, the soil should not be worked deeper than two to three inches (McGinnies 1968).

Cheatgrass is a vigorous, early spring annual that steals moisture from the top one to two inches of soil before perennial seedlings germinate. If cheatgrass is a problem, sod breakup of the area to be planted may be necessary. Sod breakup requires deep plowing and a good piece of equipment for this purpose is the moldboard plow. Unless severe wind erosion problems are expected, a moldboard plow will bury cheatgrass seed and provide good cheatgrass control while perennial seedlings are becoming established. If an area has been cultivated in the past, a number of implements can be used for summer fallowing including Rototillers, disk-harrows, disks or sweep plows.

Sweep plows or undercutters are gaining popularity in areas of winter wheat farming. The device undercuts some of the stubble while leaving much of it standing, thus saving moisture and reducing wind erosion. Small grains will volunteer after undercutting to provide feeding, nesting and brood cover for wildlife. However, sweep plows are not recommended for spring tillage before summer fallowing stubble (Snyder 1982). Unless a tire actually rolls over the eggs, sweep plows do not destroy upland bird nests, so some nests are spared using this method. Sweep plows can prevent the weed problem encountered in conservation tillage programs.

Croplands that have a tendency to erode could benefit from some of the conservation tillage techniques developed and promoted by the SCS. These techniques do not invert the soil, and a standing mulch remains on the surface throughout the year, providing year-round cover and nesting habitat. Conservation tillage will reduce erosion, save money by reducing the number of planting operations and prevent some salinity problems. Weeds can be a problem, but an active herbicide program or use of a sweep plow provide solutions.



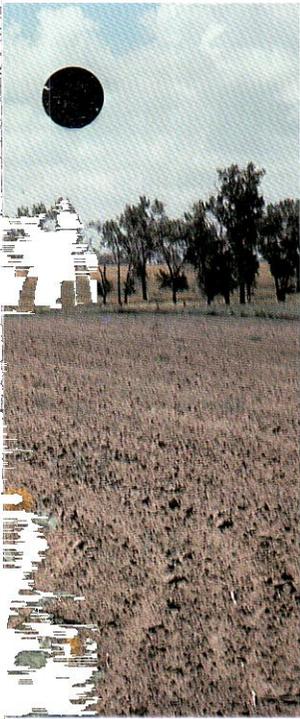
*Timing is important when it comes to breaking ground for wildlife. Stubble from crops or the previous year's grasses and forbs are important for over-winter cover and bird nesting in early spring. Late spring tillage is probably the best approach for wildlife, and it's probably a good idea to rotate tillage so that there is always some cover available.*

If mulch treaders are used in conjunction with an undercutter, all upland game bird nests will be destroyed. Mulch attachments are designed for seedbed preparation but are sometimes used for weed control. However, treaders used in the spring bury 50 percent of the residue and flatten the rest (compared to ten percent for the undercutter alone) thus increasing moisture loss and erosion. Wildlife can be helped by removing treaders from the undercutters in the spring (Rogers 1984).

#### *Seed Mixtures*

Since wildlife species prefer a diversity of plant species, plan to plant seed mixtures rather than a single seed variety. Better planting success will be obtained by combining legumes and warm- and cool-season grasses adapted to your climate and soils. Even though diversity is the goal, it is very difficult to successfully establish complicated seed mixtures. Strips of different species are often the answer to increasing vegetation diversity while maintaining a manageable stand of vegetation. These strips can be created by partitioning planter seed boxes or by making cross passes with a second seeding.

It is impossible to return cultivated land to the exact composition of native rangeland, so when seeding rangeland or perennial pastures, simple mixtures are usually best. A simple mixture of two to four species with similar palatability and



drought resistance is easiest to manage. Often, mixtures quickly return to single species because the most palatable species are grazed first and reduced to the point that only the least palatable species remain. Simple mixtures control weeds best because of their concentrated growth and competitiveness (Vallentine 1971). When annual weeds are desired, soil disturbance alone will produce good results. Disking around winter cover and food plots provides travel lanes for upland game birds and mammals.

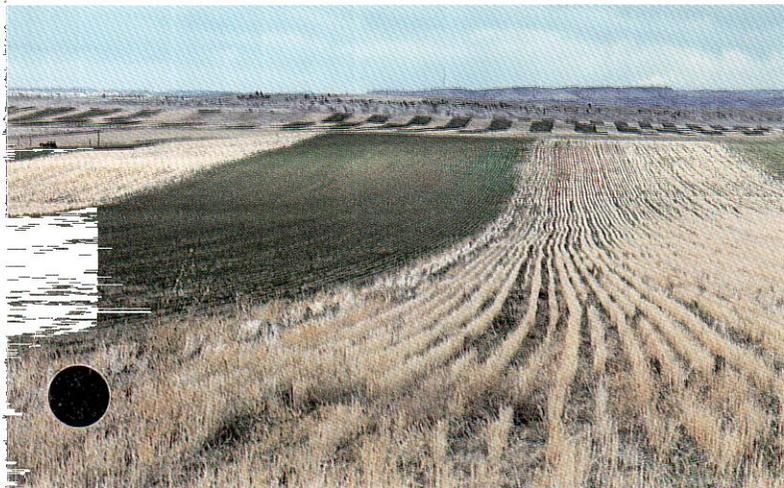
#### Seed Purchase

Seed should be purchased on a pure-live-seed (PLS) basis so the rate of live seed planted can be calculated. Seed is never 100 percent pure with 100 percent germination, but some seed sources offer cleaner, more viable seeds than others. Of course, the purest seed is the highest priced.

When purchasing seed in bulk, calculate the PLS by multiplying the purity by the germination rate on the label. If your dealer cannot supply these figures, it may be wise to purchase your seed elsewhere. When the landowner uses uncertified seed, he or she is taking a huge risk and should definitely be prepared for failure. Methods for calculating PLS can be obtained from the SCS or seed dealers.

#### Seeding Rate

Since wildlife plantings almost always consist of mixtures, the SCS recommends seeding rates in semi-arid range of 20 live seeds per square foot and up to 50 live seeds per square foot on irrigated land. Food plots do not need to be planted as densely as cropland because wildlife will use



them as long as they are located near cover. Lower planting rates may also reduce costs to the point where more food plots can be planted.

Avoid the temptation to increase seeding rates even slightly because seedlings will be more vigorous if competition is reduced. As a stand ages, it will fill in sparse areas, and plants will mature quickly, producing large, full seed heads. Seeding rates included here are for plants of a single species. For a seed mixture, use the percentage of seed equal to the percentage of the species in the mixture. For example: A mixture calls for two pounds of alfalfa per acre and six pounds of tall wheatgrass per acre. If you want a plant composition of half wheatgrass and half alfalfa, plant one pound of alfalfa and three pounds of wheatgrass per acre.

#### Seeding Methods

Broadcast seeding is useful in areas where planting equipment cannot perform, such as wet or steep areas. The rule to remember when broadcast seeding is to double the rates found in most tables, and if possible, disk or harrow the soil prior to seed application. A harrow, heavy chain or similar tool should be used to cover the seed.

Drilled seed has better germination rates, but drilling seed requires a firmer seedbed. On loose or deep tilled soils, seeds will not stay close enough to the soil surface to grow. If a man's footprint is deeper than half an inch, the seedbed is too soft.

Most recommended seeding depths range from a minimum of one-quarter inch to a maximum of one inch. Shallow planting depths are recommended for smaller seeds, such as the clovers, while larger seeds, such as the wheatgrasses, are usually planted deeper for maximum germination efficiency. Where a mixture of different-sized seeds will be planted, planting should normally occur at the depth suggested for the smallest seed (ERT 1981). A major cause of failed plantings is seed planted too deep.

Soil texture can also affect seeding depths. It is suggested that depths be adjusted such that large seeds are planted shallower (one-half inch) in clay soils and deeper (one inch) in sandy soils. Two seeding depth ranges which are frequently recommended are one-half to three-quarters of an inch for small seeds and one-half to one inch for larger seed. Some species have required seeding depths to which the planter should adhere.

*Strip cropping has advantages for western farmers as well. Strips of stubble reduce wind erosion and trap snow, increasing soil moisture in the subsequent growing season. Waste grain in the stubble offers food to a variety of wild animals, and the cover may be the only shelter available on a winter farm landscape.*

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## Seeding Techniques

### Preparation

A firm, hard seedbed is needed for seeding, and plantings should be made in strips at right angles to prevailing winds to prevent wind erosion. If soil is too loose from recent cultivation, germination will be very poor. Cultipackers can be used before and after seeding to insure good seed contact with the soil. Interseeding is generally not successful due to competition with other plants. However, if interseeding is attempted, the SCS recommends planting cover crops of forage sorghum, leaving 12- to 14-inch stubble at harvest and then interseeding into the stubble the following spring. Wheat and other grain stubbles may be substituted if sorghum is inappropriate. Narrow strips planted in alternate years will be much less prone to wind erosion, and the increased edges will benefit wildlife.

### Planting Dates

Expensive failures will be avoided by planting at a date that takes advantage of future moisture. In Wyoming, cool-season species should be planted in late fall (October-November) or in early spring (no later than April 15). Warm-season grasses should be planted in the spring before May 15. With a mixture of warm- and cool-season grasses, planting should be done in the spring to satisfy warm-season grass needs. Late summer plantings should be avoided as fall moisture and Indian summer often cause germination just in time for a killing frost.

### Seeding Equipment

Grain drills are adequate for some of the introduced cool-season mixtures, but planting native grass requires special drills (unless the seed has been milled) to remove the fluffy portion of the

seed. To plant some mixtures, drills with depth-bands are needed to plant different size seeds kept in separate boxes and planted at different depths. "Nisbet" grass drills which contain double-disk furrow openers with depth-bands, dual seed-bores with agitators and spring-tension, four inch-wide rubber packer wheels are designed for seeding perennial grasses and legumes (Wilson 1970). Other brands of appropriate rangeland drills include Truax, Tye and Miller. Many rangeland drills with hoe or shoe-type furrow-openers do not control depth of seed placement and should be avoided (Rutherford and Snyder 1983). The "cyclone seeder" is a broadcast seeder that comes in sizes from hand-held to motor-powered and satisfactorily spreads seed as well as doubling as a fertilizer spreader.

### Conclusion

With only a little extra work, you can increase the wildlife benefits of your property using the preceding or similar planting guidelines. Remember that seed planted in Wyoming must be from a climate similar to ours. Conservation organizations such as Pheasants Forever will provide landowners free seed, with no strings attached, to be used for winter food and cover. The SCS and various other extension programs can be of great assistance for onsite evaluations and consultation.

*Written by Doug Samuelson through the Wyoming Cooperative Fish and Wildlife Research Unit.*

*This publication is one in a series of habitat extension bulletins produced by the Wyoming Game and Fish Department. Call 1-800-842-1934 for additional information or assistance.*



*Pheasants, sharp-tailed grouse, and gray partridges all depend on herbaceous cover at the edge of farming operations.*

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