TOOLS AND SEEDING METHODS

MINIMUM-TILL EQUIPMENT

Minimum-till equipment is used to incorporate a portion of the surface vegetation into the soil and level uneven surfaces. One of the most common tools is a disc, which cuts through vegetation, sod or hard soil and partly turns or tills it into the soil surface.

Similar equipment that turns part of the vegetative residue into the soil surface is known as Aerway® or Turbo® Till. Chisel plows drag through and turn part of the surface vegetation into the soil. Chisel plows generally leave the soil surface rough, which will require further treatment with a disc or similar tool to make it smooth enough to plant and harvest.

ROTOTILLER

A rototiller is used to pulverize the soil with rotating blades and incorporate soil amendments and surface vegetation. Most units till up to 6” deep.

CHISEL PLOW

A chisel plow is a minimum-till plow because it does not dislodge or turn over the entire soil profile the way a moldboard plow does. Chisel plowing is primarily used for deep tillage loosening while leaving a high percentage of debris on top. The plow typically has C-shaped shanks mounted on dual coil springs and the frame, shanks and springs are of sufficient weight, size and strength to provide an 8”-12” cutting depth. The depth of a chisel plow can be adjusted to till shallow or deep. This plow is also used for breaking up hardpan and compacted areas, which is followed by a disc harrow, tandem disc harrow or offset disc harrow of sufficient weight and size to provide a 6”-8” cutting depth.

TRACKING

Tracking is the use of a crawler or rubber-tired tractor to make depressions and firm loose soil after construction or tilling. The depressions make local pockets in which seed and water can collect until they infiltrate the soil which aids in germination. The firm, but not compacted, seedbed will not dry out as quickly as loose soil.
DRILL SEEDING

Drill seeding is a mechanical means of creating a furrow (opening) in the soil surface and metering the seed in at a uniform rate.

Conventional drills are capable of working in tilled and partly tilled soil. No-till drills are designed to work in soil that has not been tilled because they have heavy openers to cut through vegetation and sod, making a furrow for seed placement. However, they can work in tilled soil with the proper adjustment. The unit contains discs equipped with springs that aid in loosening the soil. All drills should be equipped with a closing or packing wheel that follows the seed placement. A special seed box is required for handling small or fluffy seed like that of many wildflowers and native grasses. Drills that can meter fluffy seed, such as that of little bluestem, big bluestem and indiangrass, need special agitation and metering equipment to handle these seeds. Switchgrass can be planted using any drill with a small seed box that can meter low rates of small seed. A drill used to plant warm season grasses must be capable of placing seed 1/4”-1/2” deep into a firm seedbed.

Calibrating a drill or broadcast seeder depends on seed bulk density and required application rates. Many native and naturalized seed mixes contain a mix of large fluffy seed and small dense seed. Some drills have special seed boxes that can meter large fluffy seed. Many native seed mixes are planted at 10-20 lb per acre (1/4-1/2 lb per 1,000 sq ft).

A simple method for calibrating a seeder is to add a bulking agent (such as kitty litter) to create an even flow of seed. Add 40-50 lb of a bulking agent to 10 lb of seed and calibrate for 50-60 lb per acre (1 lb bulking agent to 1/4 lb of seed per 1,000 sq ft). Divide the seed into proportional areas of the project. Start seeding at a lower rate than the calculated rate. If possible, plan on seeding half of the seed in one direction and make a second pass with the remaining half of the seed in a direction perpendicular to the first direction.

A drill seeder is practical for seeding several acres or more in areas where slopes aren’t too steep. It generally has an 8’ minimum width and contains a seed hopper capable of seeding a 6’ width and row spacing of approximately 7”. Some of the best drills are manufactured by Truax Company, Inc.
HAND SEEDING

Seeding with machinery is not always effective or efficient for small plots or on difficult terrain. Hand seeding is easily accomplished when the seed is mixed with a bulking agent (such as kitty litter). Hand seeding means literally casting the seed onto the ground surface by hand. An experienced person can seed effectively with this method, while an inexperienced person can become effective with very little practice. The biggest challenge is coordinating the step-and-throw action to improve uniformity of seed placement. Divide the seeding area and seed mix into several small equal sections and hand cast the seed in two directions. Follow hand seeding up with hydromulch and a light raking or rolling to achieve good seed-to-soil contact. Do not roll or track the seed if the soil is wet.

HYDROSEEDING

A hydroteeder combines water, seed, fertilizer and, sometimes, hydromulch into a mix that is then pumped through a nozzle and sprayed uniformly over the area to be seeded. Hydroseeders can distribute this mix at a distance of 150’ or more which allows for the ability to seed terrain that may not be accessible by other seeding methods; namely, steep slopes, roadside cuts or sites that are too wet. The use of hydromulch assists in seed placement and helps to reduce erosion on slopes. Depending on site conditions, the use of erosion control blankets or straw mulch may be needed to cover the seed. Many native seeds should be broadcast with little mulch in the mix. A small amount of mulch can be applied with the seed as a marker, but must be limited to a minimum as native seeds will not germinate if suspended in the mulch with little or no seed-to-soil contact. A secondary application of mulch may be applied on top.

BROADCAST SEEDING

A broadcast seeder consists of a hopper with a material regulating system in the bottom that feeds material either onto a spinner or directly onto the soil. This system is commonly used to spread seed, fertilizer, lime and other granular products. Some materials have difficulty getting through the regulating mechanism in some broadcast seeders. For these systems, the use of a flow-enhancing material (such as kitty litter) mixed with the seed will aid in uniformity and enable the system to handle the seed. Spread half of the seed in one direction (horizontally) and the remaining seed in the other direction (vertically). Follow by rolling or tracking the seed to achieve good seed-to-soil contact. Do not roll or track the seed if the soil is wet. Cover with a light layer of straw mulch.
CULTIPACKING

A cultipacker is an excellent way of covering the seed with a minimum amount of soil to ensure proper seed-to-soil contact. It resembles a large rolling pin with evenly spaced ridges and dimples. The cultipacker's primary functions are to break up clods, remove excess air spaces from loose soil and smooth the soil surface. This method consists of heavy-duty smooth, spoke or crowfoot rollers that provide clod-breaking and smoothing capabilities. As with any tillage, it is important not to overwork the soil or work it when it is too wet.

SPRAYER

Sprayers come in various sizes and styles, including common hand-held units like that shown here. These are often preferred for carefully targeted spraying of unwanted or invasive vegetation. Larger areas may be effectively sprayed using tractor- or ATV-drawn tank units.

Use of herbicides to control undesirable vegetation can be an important part of an integrated pest management (IPM) program when used according to the manufacturer's label. Prior to using any herbicide, read the label for safe handling and application information. Many herbicides are only available to licensed applicators. When these are needed, employee a licensed professional.

STRAW MULCHING

A straw-mulch blower is used to distribute mulch over a seeded area. It consists of a slide (or chute) in which to feed the mulch, chopper blades for chopping and breaking up the mulch and a blower for spreading the mulch over large areas. Straw mulch can be spread by hand in smaller areas. Note: To minimize potential weed issues, it is important to use weed-free straw.
DISCBINE MOWER

A discbine mower is a hay-harvesting machine with high-speed rotary discs that mow biomass for baling and assembles the material into a windrow.

ROTARY MOWER

A rotary mower easily mows existing vegetation. Heavy-duty rotary mowers can be utilized as brush hogs to tame heavy grass and light brush, such as multiflora rose, honeysuckle and small tree seedlings. Heavy vegetation on under-utilized fields is difficult to mow with a discbine or sickle bar mower.

NOTE: Mowing during the growing season should not be necessary after the establishment year unless it is being used in lieu of herbicides to control weeds. In such cases, mowing height should be no lower than 8”.

To prevent succession of woody species, an important aspect of the maintenance program for an established meadow is an early spring mowing that is close to the ground (2”). Mowing should be done every one to three years in late winter or early spring, shortly before spring nesting season. This will leave cover and food for wildlife through the winter without disrupting the nesting of grassland birds.

In the second year, an adequate native meadow stand should have one to two plants per square foot, which will not (and should not) look like a lawn. Warm season grasses establish faster with good fertility and adequate, but not excessive, moisture. With ideal conditions, species may reach mature size in two years.

DISCLAIMER: The information in this review of practices is the result of more than 50 years of experience in seed production. Ernst Conservation Seeds has been supplying seeds and consulting in the reseeding of tens of thousands of acres of roadsides, surfacemined lands, conservation and restoration sites in eastern North America, as well as growing and supplying seed and consulting in the planting of hundreds of thousands of acres of CRP/CREP-related areas for erosion control and wildlife habitat. All of these practices are opinion only and our best advice as a result of these experiences. These recommendations do not cover all of the conditions that will be encountered in the field. All of the information is for individual consideration. Ernst Conservation Seeds is not responsible for conditions that will be encountered in individual situations. The use of brand names does not represent our endorsement of a specific product; rather, it represents our experience only and has not necessarily been replicated in peer-reviewed research. The use of chemical pest control agents is subject to manufacturers’ instructions and labeling, as well as federal, state and local regulations.