

# TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE

STATE OF COLORADO

NATURAL RESOURCES CONSERVATION SERVICE

## PLANT MATERIALS TECHNICAL NOTE NO. 77

February 27, 2015

To: All Field Offices and Area Offices

From: Christine Taliga, Colorado Plant Materials Specialist

Re: Conservation Cover Establishment

This Technical Note details conservation cover establishment methods for planners, producers and consultants. These methods should be utilized for both irrigated and non-irrigated sites, as applicable, to plan and apply conservation practices such as the following:

- Conservation Cover (327)
- Contour Buffer Strips (332)
- Critical Area Planting (342)
- Cross Wind Trap Strips (589C)
- Early Successional Habitat Development/Management (647)
- Field Border (386)
- Filter Strip (393)
- Forage and Biomass Planting (512)
- Herbaceous Wind Barriers (603)
- Range Planting (550)
- Vegetative Barrier (601)
- Vegetated Treatment Area (635)





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# **Conservation Cover Establishment**

## Colorado



Conservation Cover Establishment

Successful establishment of conservation plantings from seed requires proper seedbed preparation, proper seeding techniques, and quality seed. Conservation cover establishment includes grasses and forbs (wildflowers and legumes), and some shrubs which establish from seed. This guidance applies to new seedings, early successional plant establishment (interseeding), pollinator and wildlife habitat plantings, and follows Colorado NRCS Conservation Cover (327) standard and specification.

Seed to Soil Contact- Seedbed Preparation

Good seed to soil contact is essential for successful seeding and proper seed bed preparation is the first step.

For enhancement or interseeding projects, it is necessary to both prepare a proper seedbed while also ensuring a reduction in competition for the seedlings from the established vegetation. Tillage to a depth of 4 inches, or chemical control may be necessary to reduce competing vegetation. If the seedbed is too loose and fluffy, seeds will be placed too deep for proper germination and may lead to stand establishment failure. An ideal seedbed is firm but not compacted, free of competing vegetation and large clods. Refer to Colorado NRCS Plant Materials Technote 74: Seedbed Preparation for Conservation Plantings.

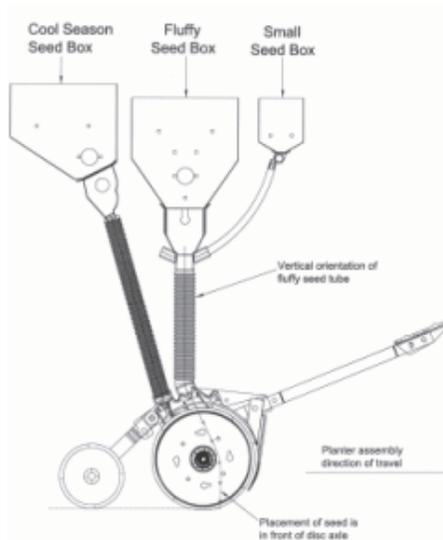


Photo 1. Courtesy www.truaxcomp.com depth

On the eastern plains of Colorado, new seedings are best established when drilled into firm, undisturbed seedbeds with cover crops, or stripper head harvested fallow wheat, that have been maintained weed free. If using stripper head harvested wheat as a cover crop, volunteer wheat must be controlled chemically prior to planting.

Seed Placement- Seeding Equipment

Proper seed placement requires equipment that controls seed depth, provides uniform seeding rate, and good seed to soil contact.

For native seed mixes, grass drills able to seed into an existing cover crop with three seed boxes to accommodate fluffy, smooth small, and smooth large seed are essential.

- Request seed separated by fluffy, smooth small, and smooth large (cool season seedbox) when ordering seed. See photo 1.
Request legumes separated with genus specific inoculum provided. The legume inoculum has a short shelf-life of approximately 10 days. Mix the inoculum with legumes, keep out of the sun, and place in smooth small seed box, along with other smooth small seed.
In some cases a carrier such as rice hulls may be required, if the seed quantity is not sufficient for the seed drill type.

Picker wheels and agitators are required for the fluffy seed box. Fluffy seed needs oversized feeder tubes to keep seed flowing evenly. Depth bands are essential for planting depth control and press/packer wheels for seed to soil contact. See Photo 2.



## Conservation Cover Establishment

### Additional Equipment Options

Additional equipment options may be approved by the District Conservationist, **as long as proper and consistent seeding depth is maintained.** For example, interseeding projects with competition from the established vegetation reduced to a minimum of 50% residue, a broadcast seeder followed by a cultipacker may be utilized.



*picker wheel*



*agitators*

Photo 2: Courtesy Bismarck Plant Materials Center



*press/packer wheel*

All equipment must be calibrated for the required seeding rate. See Colorado NRCS Plant Materials Technote 73: [Rangeland Drill Calibration](#).

**Step 1.** Determine seeding rate by counting dropped seeds after traveling a given distance on a hard surface or collecting and weighing seed from openers after traveling a given distance or turning the drive wheel a given number of rotations and weighing the seed.

**Step 2.** Make the necessary adjustments to the drill box openings, sprockets, etc., to adjust the proper seeding rate for your equipment.

Most seed mixes should be planted no deeper than ¼ inch using a no-till grass drill capable of seeding into standing cover. Seed is too deep if you cannot see a few seeds on the soil surface. Work with your District Conservationist for exceptions based on local conditions.

Equipment should be operated at low speeds (under two miles per hour) for the best performance and uniform seed delivery. When operated at higher speeds, there will likely be many "skips", disk penetration will be much more erratic, and furrow openers will throw soil into adjoining furrows

### Seeding Dates and Timing

Plant seed mixes when soil moisture and temperature are optimum for germination. For seed mixes with greater percentages of either "cool" and "warm" season species consider the following:

- ✓ Cool season species germinate best when soil temperatures are cooler and day lengths are shorter.
- ✓ Warm season species germinate best with warmer soil moisture and longer day length.
- ✓ If planting during the dormant season to encourage winter scarification of forbs, allow for a minimum of 45 days with soil temperatures at 45 degrees Fahrenheit or below.
- ✓ Strive to seed prior to a predicted precipitation event.

The following are planting dates for seed mixes with cool and warm season species by Major Land Resource Area (MLRA) in Colorado. All seeding dates are subject to local climate conditions and may be adjusted by two weeks as necessary under the direction and approval of the local District Conservationist.

MLRA	Dormant Spring	Summer	Irrigation
D34A & B, D35, and D36	Oct. 25 <sup>th</sup> to April 30 <sup>th</sup>	June 15 <sup>th</sup> to Aug. 15 <sup>th</sup>	
E47, E48A & B	Oct. 15 <sup>th</sup> to April 30 <sup>th</sup>	June 15 <sup>th</sup> to Aug. 15 <sup>th</sup>	
E49	Oct. 15 <sup>th</sup> to May 15 <sup>th</sup>	August	August
E51	Nov. 1 <sup>st</sup> to March 30 <sup>th</sup>	June 15 <sup>th</sup> to July 15 <sup>th</sup>	
G67A & B, G69, H70A, H72, H77A,	Nov. 1 <sup>st</sup> to April 30 <sup>th</sup>		May or Aug. 15 <sup>th</sup> to Sept. 15 <sup>th</sup>



### Additional Timing Considerations

For areas susceptible to erosion by wind during the dormant season with forbs requiring stratification in the seed mix, seed as late as possible (February), while still able to attain 45 days with soil temperatures of 45 degrees Fahrenheit or less. For seed mixes with warm season grass components, particularly in the eastern plains of Colorado, seed in spring into fallow grain stubble with a minimum of 70% residue that has been maintained weed free and where soil moisture has been replenished.

### **Key components**

A seeding will not successfully establish without moisture. For dormant seeding to be effective, it is critical for the seed to imbibe moisture, this is usually achieved by melting snow and freeze-thawing. Alternatively, when seeding during the growing season, seed prior to predicted moisture events to further ensure seeding success.

### **Seed Quality**

All seed purchases must be on a Pure Live Seed basis (PLS). Seed must be accompanied by seed tags with a current (less than one year old) analysis for purity and germination. Purity specifies any weed and inert matter content in the seed lot and germination indicates the percentage of seed that is capable of germinating. PLS is calculated by multiplying purity and germination (including dormancy). High PLS usually indicates high quality seed. It is essential seed of adapted species and recommended cultivars are utilized. Utilize [Plant Materials Technote 59 \(revised\)](#) for applicable species and cultivars in Colorado.

### **Weed Control- Requirements**

Weeds compete for moisture and light with young seedlings. For best results, **weeds must be controlled prior to planting and in conjunction with an appropriate cover crop.** Noxious weeds must be controlled either mechanically or chemically. Treat weeds before they produce seed. Follow [Colorado NRCS herbaceous weed control standards and specification \(315\)](#).

### **Keys to Successful Establishment**

- ✓ For a tilled seedbed, correct firmness is when an adult footprint is only slightly visible (1/4") prior to the seeding.
- ✓ Monitor how the drill is performing throughout the planting and make adjustments as needed.
- ✓ At seeding time, there should be no actively growing weeds.
- ✓ Most native species (some exceptions apply, such as Indian Ricegrass) should be planted shallow at a depth of ¼ inch or less.
- ✓ Time your seeding prior to predicted moisture events.

### **Checklist of required items for Certification**

- Follow all NRCS technical specifications.
- Provide all seed tags and labels from seed bags.
- Provide seed analysis from seed dealer which must be current (within the last 12 months).
- Seed cultivars and varieties must be followed as provided on the seeding plan ([NRCS form CO-ECS-05](#)).
- Invoices for purchased seed.
- Invoices for seedbed preparation, pre-plant weed control, planting or drilling.
- Date in which planting was performed



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