

## South Side, Bookcliff and Mount Sopris Conservation Districts

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### Great Plains No-Till Drill Manual



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This manual is intended to be a condensed version of how to safely and properly use the Great Plains no-till drill owned by YOUR Conservation District. It may not be all the instructions you need. Consult the Conservation District if you have any questions. The success of your planting is directly related to these few steps in the preparation and use of the seed drill.

Please read carefully as YOU are responsible for any damage to the drill. **We will charge you for repair costs beyond normal wear. Repair costs will be billed at \$70.00 per hour plus materials.**

### **NORMAL OPERATION:**

No-till seeding is a process where the leading coulter “opens” the ground/sod. The coulters are followed by a double disc opener that further opens the “seed bed” and places the seed in the bottom of the groove. The following gauge/packer wheels, firm the seed around the seed in the groove for better soil contact. They also function as depth control for the seed placement. The agitators in the seed boxes control the rate of seed flow and prevent packing or bridging of seed in the boxes. The seed depth may be changed using the press wheels and depth stop height on the end wheel hydraulic cylinder. However, this depth stop is pre-set and should need no adjustment. The double disc assemblies float or operate independently to float over objects, giving an even seed depth.

Normal native grass seeding depth is about 1” to 1 ½”. The soil conditions greatly affect this depth. If the ground is dry and hard, that depth may not be possible. This no-till drill weighs approximately 3800 lbs. and is preloaded to 400lbs per opener. This is generally adequate for most conditions. In dry soil conditions, it may be necessary to wait for adequate moisture to soften the ground.

Conversely, if the ground has been prepared, too much penetration may happen and the depth may need adjusting. You may need to remove the additional weights to compensate. It may be necessary to “cultipack” the seed bed if the soils are too loose.

### **RULES TO FOLLOW:**

1. **THE SEED DRILL MUST BE RAISED ON ALL TURNS AND WHILE BACKING.** Serious damage will occur to the coulters and press wheels by “ruddering” in the soil.
2. Drive speed will depend on field conditions. Rough fields should be seeded at about 2 MPH. Smoother fields at 3 mph to 3.5 mph. Too much bouncing of the seed drill will cause uneven seeding rates.
3. Under average conditions 10 to 15 acres can be seeded in 8 hours. **GOING TOO FAST WILL DAMAGE THE SEED DRILL AND RESULT IN UNEVEN SEEDING.**
4. Periodically check that the double discs are cutting the ground and that the press wheels are giving good seed-to-soil contact.
5. Add seed graphite if necessary. This prevents static build-up on seed and rubber drop chute as well as lubricates the seed. Add 1/3 cup of graphite per load of seed. Sprinkle on top of the seed. There is no need to mix into the seed.



### TRANSPORTATION TO WORK SITE:

1. The tow hitch requires a minimum 7/8" diameter pin.
2. Do not tow faster than 20MPH. There are no springs and the seed drill will pull the tow vehicle side to side.
3. Always transport with left side hub dis-engaged. (Pulled out). Serious drive linkage damage will occur if left engaged.
4. Always transport with transportation blocks in place.
5. Make sure that the drill is lowered onto the metal transportation blocks.
6. Make sure towing lights operate and safety chains are hooked.
7. If towing with a high bumper or receiver hitch, make sure press wheels are not dragging when you go through a depression or ditch.



### PREPARATION FOR USE:

1. Seed drill frame and seed boxes must be level to ensure proper seed depth and coverage.
2. Attach hydraulic hoses to remotes on tractor and raise drill to the limits and hold for a several seconds to synchronize hydraulic cylinders. Remove and store blocks as shown.
3. Lower seed drill to pre-set stops, float position. Normal depth is approximately 1" seed depth depending on soil conditions. If a different depth is desired, contact District Office or review manual.
4. Observe that drill frame and boxes are level. Level drill frame by adjusting hitch height and top link if necessary.
5. Check for adequate chain and hose length for turning.



Raised Position

- Transportation block storage
- Depth stop, drive wheel float
- Calibration handle

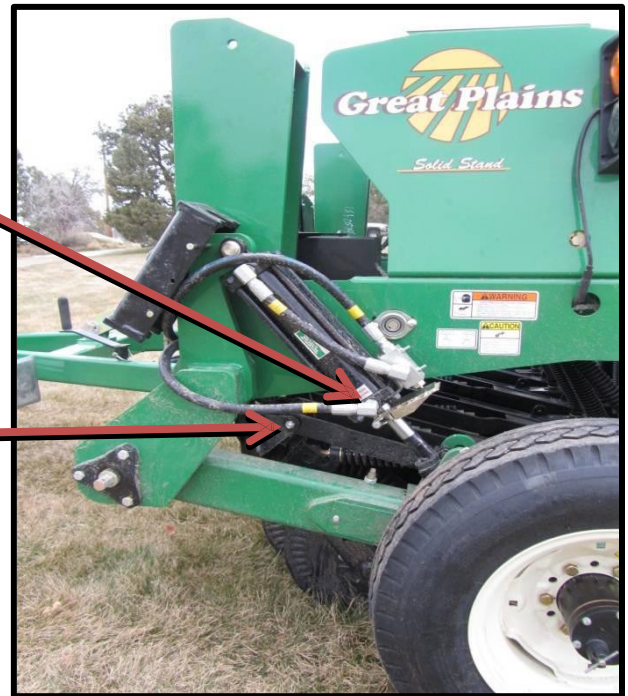


Lowered Position

Hydraulic cylinder tripped into float position

Note that there is a slight gap between depth stop foot and trip pin

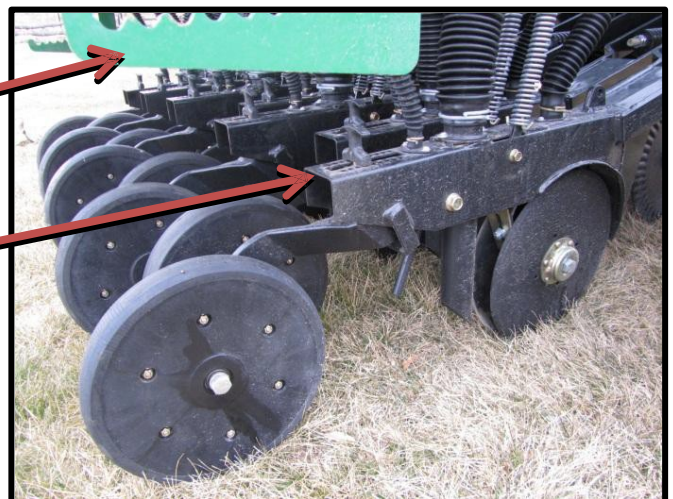
Storage of calibration handle



- Adjust hydraulic depth stop if necessary. Loosen bolts, slide foot down. Pull forward until coulters are at desired depth. Slide foot until it contacts the release pin on hydraulic cylinder, then slide down another 1/8". Raise fully and lower drill to synchronize hydraulic cylinders.

Foot step

Fine tune depth with press wheel "t" handles. Each hole is approximately 1/8". A "floating" action of the press wheels is normal. Slide tee handle forward for shallower seeding, rearward for deeper seeding.





7. Place Seed in the appropriate seed box. Use foot step, not the coulter assembly to climb onto platform.
  - a. The front grain seed box is a grain box used for wheat, oats and similar smooth seeds. The seeding rate is controlled by the large handle lever under the box as well as the 4 speed gear box.
  - b. The middle box is the native grass box is used for seed mixes, native grasses. It has specially designed “picker wheels” and agitators that pull the seed into the delivery chute. The seeding rate is controlled by the drive chain sprocket size and 4 speed gear box. This box is for brome grasses, orchard grasses, wheat grasses and other mixes that are difficult to seed. Because the seeds tend to bind together, it best to use this box for all grasses and mixes. IT MAY BE NECESSARY TO ADD SOME SEED GRAPHITE ON TOP OF THE MIX TO HELP WITH THE SEED FLOW. Add 1/3 cup graphite on top of the seed mix after it is placed in the seed box. No mixing is necessary.
  - c. The rear box is a small seed box mainly for alfalfa and small wildflower seeds. The seeding rate is controlled by the lever under the box.
8. Note acre meter reading.

#### **CALIBRATION OF SEED - NATIVE GRASSES BOX:**

The native grass box (middle box) is for all light weight, fluffy seed like brome, crested wheat grass, orchard grass, and similar seeds. *These grasses may have a “beard” or feathery tail that tends to bind or “bridge” in the box, thus not flowing evenly.* The unique agitator and picker wheel design are specific for these difficult seeds to plant. Normal wheat, oats, etc. are used in the main grain box (front box). Alfalfa and small seeds are for the small seed box. Because there are so many different seed mixes, weights and seed sizes, it may be necessary to calibrate the seed drill. **Please see recommendations from the Conservation Office for actual, proven rates.**

Seeding rates are managed by the 4 speed gear box and changing the drive chain sprocket on the left side of the seed drill. The drive is setup at a REDUCED rate for native grasses. The only accurate way to calculate the seeding rate is to manually change the sprocket. For most applications, the existing settings are adequate. If you prefer for more precise rates, consult the Conservation District technician for help. The following is a brief overview.

1. With drill level and coulters touching the ground, the drive chain clutch is engaged. Manual calibration of the seed delivery can be made using the calibration handle. Ninety-nine (99) turns on the calibration handle represents 1/10 acre. By weighing the seed dropped through the chutes, you can calculate the amount of seed per acre.
2. Seeding rates are adjusted by two means, a set of different size sprockets that control the native grass box (located on side of drill under black plastic cover) and a 4 speed gear box.

3. Initial seeding rates are made using the sprockets on the drive chain on the side of the seed drill. Please request assistance for initial seeding rates.
4. The gear box shift handle has 4 positions. Each position adds an incremental percentage of seed delivery of the # 1 position. IE. # 1 position is 10 lbs. / acre; # 2 is 20 lbs./acre, # 3 is 30 lbs./acre; # 4 position is 50lbs./acre.

- 4 speed gear box
- Acre Meter
- Drive chain clutch, engaged
- Calibration handle



5. Place empty containers under 3 or 4 of the delivery chutes for the native grass box.
6. Place enough seed mix in the seed box over the drop openings that correspond to the drops with containers. You can put seed just one side of the box over the drop holes being measured. Add enough seed to mostly cover the agitators. Place a tarp or other material under remaining seed drops.
7. With the drill lowered to engage the drive chain clutch, manually turn the calibration handle.
8. Count the revolutions or watch the acre meter. 99 turns is 1/10 acre.
9. Weigh the seed collected in all three of the container cups. Multiply by 3 to allow for the total number of seed drops (9 total drops). Multiply this total by 10 for the amount of seed applied per acre. The math with a 3oz sample in each container:



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- a. 3oz. per container  $\times$  3 containers  $\times$  3 [9 rows total]= 27oz seed per 1/10 acre.
- b. 27 oz.  $\times$  10 = 270 oz. per acre 270oz/16oz. per lb. = 16.8 lbs. seed per acre

10. Change sprockets if necessary. Use seeding charts for a broad reference for selecting the appropriate sprocket. Additional sprockets are located on the right side of the drill. The smaller the sprocket, the higher the seed rate.

CALIBRATION OF SEED - GRAIN BOX:

The main grain box (forward, front box) is designed for “slick” uniform seeds such as wheat, beans, some grasses. These seeds tend to flow evenly. Some seed mixes will flow very well in this box. Please refer to the seed rate chart book for initial seed rates.



1. The main grain box seed rate is controlled by the seed rate lever located under the box on the right side of the drill **AND** the 4 speed gear box.
2. The lever is marked in increments from 1 to 100. This is an arbitrary number, not the (pounds of seed per acre).
3. The gear box shift handle has 4 positions. Each position adds an incremental percentage of seed delivery of the # 1 position. IE.
  - a. # 1 position is 10 lbs. / acre;
  - b. # 2 is 20 lbs./acre,
  - c. # 3 is 30 lbs./acre;
  - d. # 4 position is 50lbs./acre
4. Calibration of seed can be made in the same manner as described above using catch containers and turning the calibration handle. Because the drop shoot is between the double disc, it is necessary to spread a tarp under the double disc to catch the seed.

LEFT SIDE OF DRILL

- Main grain box
- Native Grass box
- Small Seed box
- Native grass box calibration sprocket



**RETURN:**

1. Raise drill, reinstall hydraulic cylinder blocks, lower drill onto blocks
2. **DISENGAGE DRIVE HUB, pull pin and turn to outer slot located on the left drive wheel hub.**
3. Clean all seed from seed boxes and chutes. A shop vacuum works the best, or air compressor.
4. **Clean all mud, weed seed and trash before transporting.**
5. Secure jack, calibration handle.
6. Make sure all manuals are with drill.
7. Make sure that press wheels have plenty of clearance when on a tow vehicle to clear ditches and bumps.
8. Close all seed box levers.
9. Attach safety chains, lights, make sure hub is disengaged.
10. Do not tow more than 20 MPH.
11. Make final check in with Conservation District employee.

**THANK YOU FOR YOUR COOPERATION AND SUPPORT OF THE SOUTH SIDE, BOOKCLIFF AND MOUNT SOPRIS CONSERVATION DISTRICTS.**

**PLEASE REPORT ANY PROBLEMS AND SUCCESSES TO THE CONSERVATION DISTRICT.**

**WITH YOUR HELP WE CAN CONTINUE WITH A SUCCESSFUL SEED DRILL PROGRAM.**