

# TECHNICAL NOTE

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## **Using a Grain Drill with Small Seed Attachment to Increase Planting Accuracy of Cover Crop Mixtures**

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This Technical Note provides instructions for using a small seed attachment on a grain drill to more accurately plant diverse cover crop seed mixtures.

## INTRODUCTION

As conservation agency personnel and innovative farmers tout benefits of multi-specie cover crop mixtures for soil health, more farmers and ranchers test the practice on their farms. Cover crop seed mixtures can be challenging to plant as they often include combinations of seed from different functional groups and species with very different sizes and weights. Also, the different seed components in a mixture may have different planting depth requirements to achieve acceptable germination and emergence of each species in a seed mixture. An additional concern with seed mixtures is that the small seed may sift or separate in the seed box as the drill operates across the field. This results in each specific seed in the mixture being planted at varying amounts as the drill crosses the field. It is not always possible to meet all the differing planting requirements of a seed mixture using a standard equipped grain drill equipped with one seed box, as the limitations are the capability of only one planting depth and all seed must be mixed together. One alternative to alleviate both issues, is to



*Figure 1. Grain drill with optional small seed attachment included on the back of the large seed hopper*

to plant at a different depth than the large seed box. Seed from a large seed box is typically delivered into the drill openers and seed at the opener depth set by the operator. The small seed box can be configured in multiple ways, allowing seed to be planted at depths different from the main hopper. This allows producers to match seeding recommendations using one planter set for multiple depths, while making only one planting operation in the field.

use a drill equipped with a small seed box in addition to the large seed box.

Most grain drills can be outfitted with an additional seed hopper, often referred to as a small seed attachment, to address issues associated with planting seed mixtures. An additional seed hopper adds flexibility for planting at multiple seeding depths and controlling the rate at which small seed and large seed are planted.

The small seed attachment is a seed hopper on a grain drill designed to function with the small seeded cover crop species. The small seed attachment has finer adjustment capabilities, allowing the producer to accurately calibrate the grain drill for small seeds allowing small seeded cover crops to be planted at lower rates.

Typically, the small seed attachment can be calibrated independently of the large seed hopper allowing seeding rates for large and small seed to be optimized. By having separating the small and large seed in different seed hoppers, the small seed does not sift to the bottom of the seed hopper causing non-uniform distribution of species across the field.

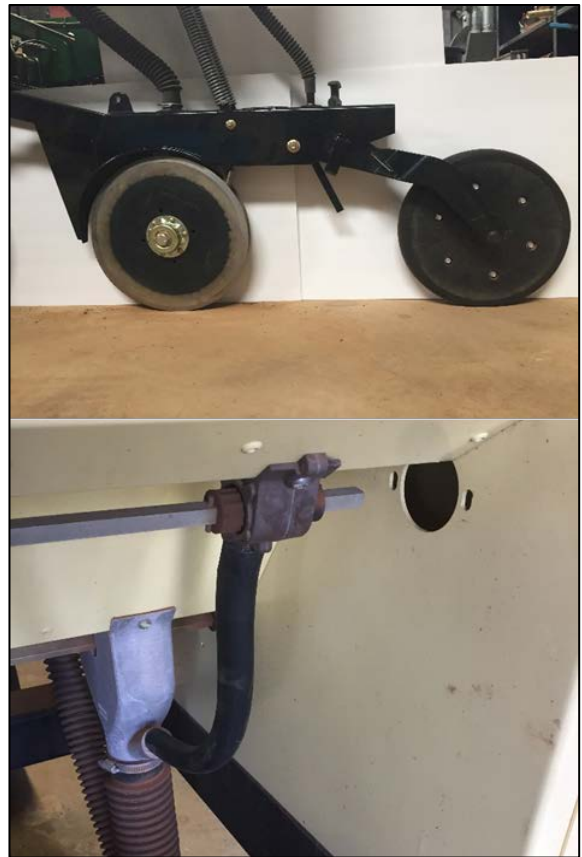
The small seed attachment can also be configured



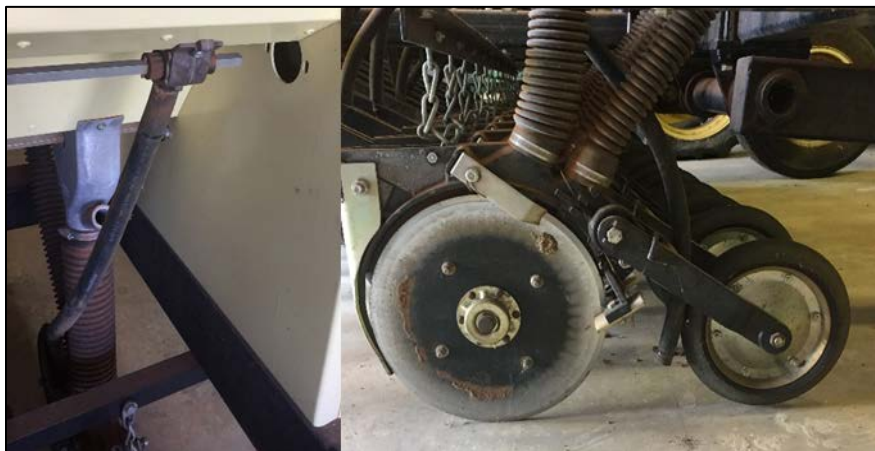
## Modifying the small seed attachment for multiple depth planting

While the small seed attachment on a drill may be configured from the manufacturer to plant at a shallower depth than the large seed hopper, others will need to be modified. Figure 2. shows two different ways small seed attachments are configured by grain drill manufacturers. In the top photograph, the small seed attachment places seed directly in front of the press wheel via the small seed tube seen protruding down from the row unit between the disk openers and the press wheel. It does not place the small seed at the bottom of the seed furrow. This configuration will allow for seed from the large hopper to be placed fully into the open seed furrow created by the disk openers while seed from the small seed box are simultaneously placed in front of the press wheel by the small seed attachment allowing for multiple planting depths. In the bottom photograph, the seed tube from the small seed attachment goes into the main seed tube of the large seed hopper. While this configuration allows for the better seed metering and reduced seed sifting, it does not allow for multiple seeding depths.

If the producer wants to plant at multiple depths but has a grain drill configured like the bottom photograph in Figure 2., the seed tubes will need to be rerouted and possibly lengthen so the seed is placed directly in front of the press wheel. The end of the seed tube can



*Figure 2. Two common ways that grain drill manufacturers route seed from the small seed attachment.*



*Figure 3. Modifications made to this grain drill to direct seed from the small seed attachment to a shallower planting depth outside of the seed furrow.*

be attached to the frame of the grain drill near the press wheel with wire or cable ties so that the seed tube does not move once the planting begins. Figure 3. shows how this grain drill has been modified to achieve multiple depth planting from the separate large and small seed hoppers. The seed tube coming from the small seed attachment on this grain drill has been lengthened and rerouted so that it ends immediately in front of the press wheel for that row unit.

## Dividing the Seed into Batches

Once the grain drill has been configured correctly at multiple depths, the individual species comprising the mix will need to be divided into groups based on seed size and recommended seeding depth. An example cover crop mix and example seeding rates are shown in Table 1. In this example, the producer would mix the larger seeded cereal rye, hairy vetch, and oats in the large seed hopper on the grain drill and mix the smaller seeded crimson clover, daikon radish, and rapeseed in the small seed attachment. Table 2. summarizes the two separate seed batches that the producer would create and the seeding rates for each seed batch.

*Table 1. Example plant species and seeding rates for cover crop mixture*

| Example Plant Species | Example Seeding Rate (lbs/acre) |
|-----------------------|---------------------------------|
| Cereal Rye            | 15                              |
| Crimson Clover        | 3                               |
| Hairy Vetch           | 3                               |
| Daikon Radish         | 1.5                             |
| Rapeseed              | 0.5                             |
| Oats                  | 10                              |

*Table 2. Seed batches from example cover crop mixture*

| <u>Large Seeded Batch</u>    | Seeding Rate (lbs/acre) |
|------------------------------|-------------------------|
| Cereal Rye                   | 15                      |
| Hairy Vetch                  | 3                       |
| Oats                         | 10                      |
| Total for Large Seeded Batch | 28                      |

| <u>Small Seeded Batch</u>    | Seeding Rate (lbs/acre) |
|------------------------------|-------------------------|
| Crimson Clover               | 3                       |
| Daikon Radish                | 1.5                     |
| Rapeseed                     | 0.5                     |
| Total for Small Seeded Batch | 5                       |

The seed are grouped based on seeding depth and a total seeding rate for the group is determined by adding the individual seeding rate of each component of the group. In the example, the large seeded group would be planted at a seeding rate of 28 pounds per acre while the small seeded group would be planted at 5 pounds per acre. Since each box can be calibrated independently, the boxes would both need to be calibrated to the seeding rate of the appropriate group allowing each seed group to be planted at its appropriate rate and depth.

For more information on grain drill calibration, see Idaho Plant Materials Technical note 69 “Calibrating a Seed Drill for Cover Crop Mixtures”.

## Conclusion

Seed mixtures with variable seed sizes can be challenging to plant with a grain drill as a single planting depth is often not appropriate for all seeds in the mixture. Grain drills can be outfitted with small seed attachments that, when used in combination with a large seed hopper allow for more accurate seed placement, better metering of small seed, and reduced risk of seed sifting and separating during planting yielding better plant stands for all seed species in a mixture.

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