

Selecting Openers and Packers

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The selection of a producer's first direct seeding tool, second direct seeding tool, or retrofitting an older non-direct seeding tool is a decision that takes both time and research. Investing money in a system that is not appropriate for your conditions can cause severe problems during seeding time. Time, questions and research need to be done by a producer before a purchase is made to ensure the system is right for the targeted area. There are many types of direct seeding equipment available that are able to double shoot with multiple air delivery systems. This allows fertilizer to be seed placed, side banded, or mid-row banded. The openers available range from spreader tips, side band, paired row, and disc type. Producers easily overlook the importance of the correct opener and packer when purchasing new equipment. Veteran direct seeders know that the opener/packer combination plays a big role in direct seeding. The right system will make seeding more manageable, trouble free, and give the best conditions for seed germination and crop establishment.

The decision to direct seed does, however, require more than just the seeding equipment. Successful direct seeding requires a systems approach. Proper management for direct seeding starts in the fall behind the combine with chaff and straw management. Straw management is required in order to have trouble free seeding with minimal drill plugging in spring. It is recommended to have the straw spread at least 80% the swath width and chaff at least 60%. Heavy harrows or harrows are a useful tool for spreading straw in a post harvest application although the harrows are not very successful in redistributing chaff.

Opener Selection

Budget, soil type, current system, moisture conditions, chaff management, stoniness, topography, and type of fertilizer used affects the decision on the correct opener/packer combination. Selecting the right row spacing is one of the first decisions that needs to be made when purchasing new equipment. Research in this area says that in the brown and dark brown soil zone, 10 inches or less is preferred. In the black and gray soil zone any spacing will work. Wider row spacing gives less disturbance, reduces draft requirements, decreases opener expenses, and enhances residue clearance.

There are numerous companies and types of openers available. Single shoot openers are quite popular, especially on older air seeding systems. These systems use a single delivery system that delivers seed and fertilizer together in the same band. A draw back of this system is the amount of fertilizer that can be placed at the time of seeding. If a narrow opener is being used, the seed bed utilization is low and consequently low amounts of fertilizer can be added. Using wider openers such as a spreader tip or sweep can increase the amount of fertilizer; however, this increases the draft requirements, increases disturbance, dries out the soil, and damages the soil structure.

Other options to delivering higher amounts of fertilizer include adding mid-row banders between every second opener and side banding liquid fertilizer. Adding a liquid kit to a seeding tool is

much less expensive than a new system with double shoot capability. If a producer chooses not to retrofit their existing equipment for one pass seeding, banding prior to seeding with coulter or narrow low disturbance openers is an alternative. When installing a liquid system, the opener should have a wing on the side of the opener to sideband the fertilizer in the proper location. Single shoot systems are the most common systems to be retrofitted with liquid fertilizer kits.

Double shoot openers include paired row and side band. This requires a system with at least one airway for seed and another line equipped for air, liquid or Anhydrous Ammonia (NH₃). If the system has a tank with dual air delivery, mid-row bands can be utilized. Most new airdrills are equipped with dual airlines. Double shoot openers usually require more draft and disturb the soil a bit more than single shoot. Openers that are designed for double shoot are more expensive than single shoot openers. Single side band disturbs the soil less than a paired row, which places fertilizer in the middle and seed on either side.

Attention must be paid to seed/fertilizer separation when double shooting. To safely apply high amounts of nitrogen fertilizer it is preferable to have the fertilizer placed at least 1 inch from the seed band. When applying dry granular fertilizer in the side band, air pressure needs to be watched for fertilizer blowing into the seed row or seed blowing into the fertilizer row. Digging in the furrow behind the seeder to check seed/fertilizer separation recommended. NH₃ can also be used in a side band or paired row. NH₃ can cause severe seed burn. It is important to pay special attention to separation when using NH₃. Indicator test kits can be used to check separation behind the seeder. When using NH₃, lateral separation is more important than vertical separation. It is also important to check for seed/fertilizer placement a few times during the spring seeding time. Opener and seed placement dynamics can change as soil texture and moisture changes. The velocity of the drills also affects the placement of seed and fertilizer. It is not recommended to travel in excess of 5 mph. It is not only placement that is affected by speed but also depth and disturbance. Many producers will check placement one year and think it is ok until they change openers. As openers wear, separation can drastically change. This is really important to watch, especially when using NH₃. The openers should be checked in high wear areas so if these areas are good then the rest must be ok as well. Failure to get adequate seed fertilizer separation results in germination and crop establishment problems. The consequences can be expensive when some seed costs exceed \$20 per acre.

Depth is important for proper crop emergence. Changing openers can change the depth of seed because of different styles of opener. Seed depth should be checked behind the seeder on every row of openers and on each section of the tool to ensure the seeder is level.

Packing

On-row packing is very important to crop establishment. Packing increases seed to soil contact which allows the seed to take up moisture more easily. It is important to utilize on-row packing so only the seeds in the row are packed. Anytime other areas are packed, aside from the seed row, the benefit of quick emergence and crop competition is given to the weeds. Coil packers and packers that are too wide for the seed row ride on top of the furrow ridges, pack the weed seeds and leave the seed row unpacked.

Packer selection is quite easy if an opener selection is already made. Firstly, **match the width of the packer to the width of the opener**. If the packer is too narrow some seeds in the furrow will not be packed. If the packer is too wide, it will pack the weeds in the ridge but not the seeds in the furrow. Side band and paired row openers should have round or V-shaped packers. If a V-shaped is used with a paired row the seed is pushed down and the fertilizer will be pushed to either side increasing separation. It is important to ensure the packer is in-line with the opener so the seedbed is being packed in the targeted area. If the alignment is not correct, seed/fertilizer separation can be reduced. Once the shape of the packer is chosen there are two types of set-ups available: gang mounted or shank mounted. Both systems need to be evaluated on how they will fit on a seeder being retrofitted. Gang mounted handles heavy residue a bit better. Pneumatic or steel packers can be used; pneumatic are used in areas of clay soils. The soil will break away from the packer when the rubber flexes. Steel packers are used in sandy soils where the soil does not stick to the packer.

The importance of opener and packer selection should not be underestimated whether buying a new system or retrofitting an existing system. Time should be taken while making this decision. One of the most useful ways in making the right decision is to evaluate how the openers of neighboring farmers are working on the same soil you have.