Seed Hawk

Performance and Agronomy Handbook


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Seed Hawk Performance and Agronomy Handbook

The purpose of this handbook is to demonstrate and discuss the various methods of optimizing the agronomic performance of the Seed Hawk drill.

Parameters of agronomy change frequently when it comes to crops, soils and fertilizer; therefore, it is important to adjust machine settings as necessary to deliver maximum agronomic performance. This is achieved by precision product metering and placement which results in a quick, evenly growing crop to facilitate strong yields and quality at harvest. Consistent crop performance, by way of improved agronomic direction, that delivers greater return on investment to the grower and improved risk management on the farm.

As agronomic parameters change between every farm, from one growing season to another and within the same year, it is important to note that the discussions in this document are meant to be suggestions only. It is important to consult with a licensed professional agrologist regarding specific decisions relating to agronomic stewardship in a farming operation.

Fertilizer Rates and Placement

Nutrients are one of the most critical components of plant growth and optimizing both the rate and type of fertilizer applied specific to the crop and soil conditions is an important step in crop success.

To determine how much nutrients are required to achieve desired yield goals, it is important to conduct soil testing to examine nutrient levels present in the soil as well as yield potential. Soil testing typically takes place in cooler weather prior to the following growing season.

Once the soil test results are known, consult with an agrologist to determine the ideal course of action regarding fertilizer rates, type of fertilizer to use and ideal placement. Soil types, crop to be planted and moisture levels both at seeding time and expected during the season are some of the factors to be considered.

When determining fertilizer rates and placement options, it is important to consider the Seed Bed Utilization (SBU) of the toolbar which is determined by the row spacing of the fertilizer openers and the width of the opener itself. Below is an SBU chart related to the various knife and row spacing options available on the Seed Hawk drill:

Knife	10” Spacing	12” Spacing
Single Side band	5%	4%
Inline Side Band	6%	5%
Twin-Wing	N/A	8%

The SBU of the toolbar directly affects how much fertilizer can be safely applied with the seed, as does the type of fertilizer being used. Different fertilizer formulations have different levels of toxicity, and it is important to consider this as well as soil moisture levels at seeding time. In terms of safe rates of fertilizer with the fertilizer knife, these factors as well as the distance from the seed row are considered and the various options of seed knives available are discussed in the Knife Selection section.

Seeding Rates

Along with moisture and nutrients, plant stand is a key component of yield potential.

Along with moisture and nutrients, plant stand is a key component of yield potential. The first step in producing an ideal plant stand that maximizes use of soil water and fertilizer is determining seeding rate. Ideally, the goal is to produce as many plants as required to achieve maximum yield while limiting the amount of competition between plants for resources including sunlight. The desired number of plants will change from year to year based on soil moisture levels; growing seasons with sufficient moisture amounts are able to provide enough water for higher seeding rates while seasons with limited precipitation require a reduced plant stand to reduce plant competition for scarce moisture.

Seeding rate with Seed Hawk drills is calibrated in pounds per acre (lbs/ac), however it is important to consider seeding rate in seeds and plants per area which is typically per square foot. When a drill is set to a specific seeding rate in lbs/ac, the actual number of seeds being metered out is determined by the weight of the individual seed lot, typically known as Thousand Kernel Weight (TKW) and expressed in grams (g). Using this number, convert the target seeding rate to pounds per acre. In terms of final seeding rate, seedling survivability is also required as several factors can affect how many seeds germinate and emerge to become viable plants. Consult with an agrologist to determine any factors that may affect seed survivability in a particular field or crop season.

Roller Selection

Seed Hawk offers five different rollers to use with the Fenix III metering system. A chart displaying the different options of rollers and their applications is listed below.

Seed Hawk offers five different rollers to use with the Fenix III metering system. A chart displaying the different options of rollers and their applications is listed below. If using a different roller for the same application, be sure to perform a static calibration to ensure the correct rate of product is being delivered. If applying rates of monoammonium phosphate fertilizer higher than 60 lbs/ac, it is advised to use the grey 120cc roller to ensure accurate metering.

Fenix III meter Roller Option					
Color	Blue	Grey	Grey	Black	Yellow
Volume cc	18 cc	60 cc	120 cc	400 cc	500
Roller Output /lbs/ac)	Low (1-12)	Low (3.5-45)	Med (6-60)	High (30-350)	Ultra (40-400)
Product					
Starter Fertilizer		●			
Fertilizer			●	●	●
Inoculants	●	●			
Canola	●				
Barley				●	
Wheat				●	
Oats				●	
Large Bean					●
Flax		●	●		
Peas					●

Machine Startup

When engaging the cart fans at the start of the day, it is important to allow the fans to operate for five minutes to allow any moisture in the product lines to dry.

Granular fertilizer may contain a substantial amount of dust (especially sulfur) and this dust can accumulate over time and lead to plugging. Reducing moisture in the primary product lines is one way to help avoid this issue. Prior to seeding, it is also advised to run the hydraulic circuits to allow the oil to warm up so that opener operations perform quickly. This is especially important in sectional control functions to avoid overlap and misses.

Knife and Row Spacing Selection

Choosing which seed knife to use on a Seed Hawk drill involves taking into consideration factors such as fertility program, soil type and management practices. All knives on the Seed Hawk drill involve placing the seed row above and to the left of the fertilizer band to create a side-band seeding profile.

Single Side Band Knife

The Single Side Band (SSB) knife is located 1 inch to the left and 0.75 inches above the fertilizer knife, providing 1.5 inches of separation between the seed and fertilizer bands. The SSB knife design provides the most consistent performance in the widest variety of conditions. With the offset nature of the opener design, bunching of previous crop residue in high residue field conditions may occur. It is therefore important, as it is with all types of planting equipment, to properly manage crop residue beginning with the previous years' harvest.

Inline Side Band Knife

The Inline Side Band (ISB) seed knife is positioned directly behind and 0.75 inches above the fertilizer knife. Side banding of the seed row is achieved by the horizontal knife tip design that places the seed 2 inches away from the fertilizer band, increasing seed safety when it comes to fertilizer toxicity. With the two knives positioned directly in line with each other, residue flow from the previous crop is improved as well as field finish. Additionally, with the horizontal knife tip design placing seeds into the undisturbed soil of the side trench as opposed to a packed trench of a vertical knife, greater consistency of seed row placement in proximity to the fertilizer band is achieved. The ISB knife, because of its design, has shown to be prone to plugging in heavy wet soils especially in tight turns.

Twin Wing Knife

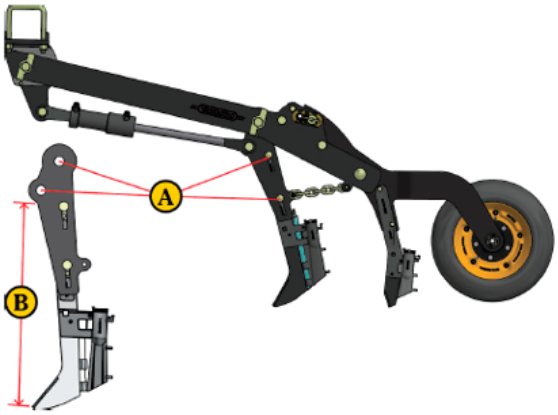
The Twin-Wing (TW) seed knife is also located directly behind the fertilizer knife and produces two separate seed rows on either side of the fertilizer row, both at 1.5 inches distance from the fertilizer. Spacing between the seed rows from the opener is 3 inches apart; this characteristic also reduces the spacing between opener rows on the drill which provides greater crop competition in terms of cultural weed control. With the larger physical size of the TW knife, a higher amount of soil movement is expected during seeding operations which can lead to a rougher field finish and inconsistent product depth. It is recommended to operate at the drill at slower speeds to reduce soil movement and ensure a proper field finish. This will be discussed further in the Machine Operation section.

Knife Adjustments

In seeding operations where a higher rate of fertilizer application is desired, an increase to the distance between the seed and fertilizer rows may be necessary to ensure safety of the seed from potential fertilizer toxicity.

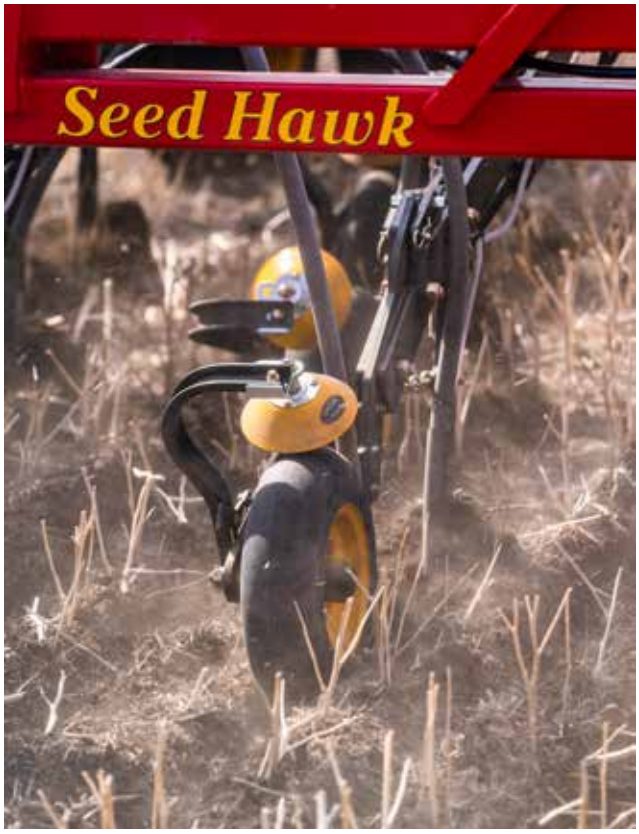
The fertilizer knife on the Seed Hawk opener is designed to allow adjustment vertically which increases product row separation by an extra 0.5 inches. The bolts to adjust vertical separation as well as the factory setting measurements are shown below. For instructions on how to adjust vertical separation, consult the Seed Hawk owners manual.

- **(A)** Hardware
- **(B)** Factory Setting Fertilizer Knife: 20–7/8 in. (530 mm)



Packing pressure

Packing pressure is an important component of ensuring proper seed to soil contact which provides essential moisture and nutrient access to the seed. Typically, packing pressure is set when the chains on the openers are tight during seeding. It is advised to add 200 psi of pressure once opener chains are tight to ensure firm packing of the seed bed. Ideal packing pressure will change depending on soil types and soil moisture conditions. Soils that are dry may require more packing pressure to seal in the soil to ensure moisture preservation while wet soils may require less to avoid soil overpacking. Additionally, in fields characteristic of lumpy soil, heavier residue and rocks, packing pressure is necessary to maintain consistency of seed depth which becomes even more important in years where soil moisture conditions are highly variable due to limited rainfall. To ensure correct packing pressure is being achieved, set the hydraulic flow to the openers to its maximum capacity setting.



Depth Selection

Choosing the ideal seeding depth for a seeding operation varies based on crop, current soil moisture levels and expected future precipitation.

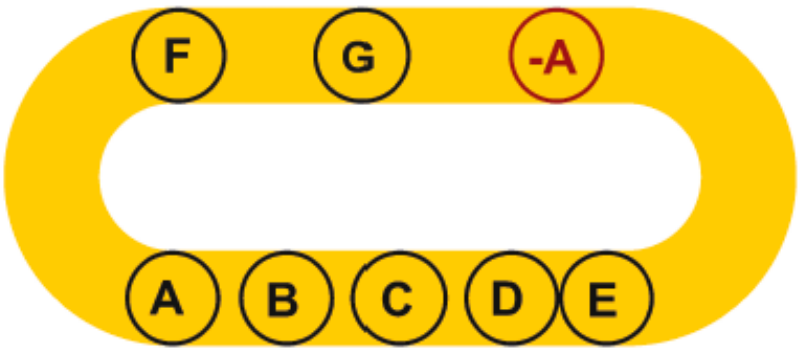
To ensure germination, the seed must be placed into sufficient soil moisture. As soil moisture levels in the field can greatly fluctuate even at the same depth due to changing soil conditions, it is important to set the opener at a depth where each seed, to the best judgement, is placed in as similar moisture conditions as possible.

Seed depth in an operation is determined by both the mechanical settings on the opener, shown below, and packing pressure.

This chart is meant to serve as a guideline only and it is required of the operator to check seed depth constantly during seeding to ensure the desired depth is being achieved. Drills are shipped from the factory set on depth setting “D” which is ¾”.

Seed Depth Pin Legend

- A 3/8” (9.5mm)
- B 1/2” (12.7mm)
- C 5/8” (15.9mm)
- D 3/4” (19.0mm)
- E 1” (25.4mm)
- F 1-1/4” (31.7mm)
- G 1-1/2” (38.1mm)
- -A >3/8! (9.5mm)



Machine Operation

The main goal of the seeding operation is to deliver precise product placement in the soil, both in terms of seed/fertilizer placement within their respective rows on an undisturbed soil shelf and consistency of product depth.

Doing so requires the implement to complete the operation while disturbing as little soil as possible. Proper contact of seed and fertilizer to the soil requires soil to close around the product once it is delivered by the air stream. Minimizing disturbance also results in more moisture being retained in the soil which is important in years of reduced precipitation.

When it comes to speed of seeding operation, it is generally advised to operate the drill at 4 to 4.5 miles per hour. In conditions featuring heavier soils and heavier residue from the previous crop, operating at the lower speed is required to maintain product placement and field finish. This is especially important in situations such as:

- Application of NH3 fertilizer to ensure soil closure around the fertilizer trench.

- When using the TW knife as the larger design of the knife facilitates greater soil movement.

As mentioned in the Seed Depth section, it is imperative to continually check seed depth during seeding operations which requires keeping a tape measure, ruler or seed depth checking tool available at all times. Be sure to check different sections of the toolbar to ensure consistent depth is being achieved across the entire width of the implement.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Väderstad iCon – Blockage

During seeding operations where fertilizer is being placed with the seed, due to the blockage sensors being unable to detect the difference between a blocked seed run and fertilizer moving through it, it is important to periodically check that all seed runs are clear. To do this, turn off the seed-placed fertilizer bin during seeding for a minimum of 50 feet and note the product runs on the blockage section of the iCon control.


Seed Hawk

Seed Hawk General Tips and Tricks

How to Seed in Heavy Trash

Seeding in heavy and/or wet residue requires a slower operation of the drill to allow better flow through the openers and reduce bunching. As mentioned previously in the Knife Opener section, the ISB seed knife allows for better residue flow with its location directly behind the fertilizer knife. It is advised to facilitate residue management during the previous years' harvest operation with straw chopper knives and residue spread on combines. In terms of seeding operations to manage residue, seed at a slight angle to last season's rows especially with lodged residue. With extremely wet conditions it is advised to wait for residue to dry.

How and When to Trim Rubber Drop Tubes

Drop tubes should be trimmed when one or both sides become worn to the point where the rubber loses structural stability and the end of the tube collapses and closes off the opening. Tubes should slide down so any thin rubber will be below the cut line. They should be cut at the same angle as factory tubes, with the lower point behind the knife and ¼" below the stainless retaining clip.

How to Avoid “Stepping”

Drill “stepping” is described as when excessive soil movement from openers creates an uneven seeding depth across the toolbar. Most stepping is caused when the middle and rear openers throw soil on the front rows, burying the seed further and creating potentially three different seeding depths. Such activity tends to take place in heavy, wet soils where soil tends to clump. To avoid stepping, it is advised to run the drill at reduced speeds to produce less soil movement from the openers. This is especially important with the Twin-Wing knife with its large design resulting in higher amounts of soil movement.

Seeding Between the Rows

Opener operation between the rows of the previous crop is desirable to reduce residue bunching as well as the chance of residue interfering with the placement of seed and fertilizer. Improvements in satellite auto steer technology in tractors allows the operator to seed between the rows with excellent accuracy.

How to Assess Knives for Wear and Replacement

It is important for opener knives to be inspected regularly to ensure that they are not worn to the point where proper seed and fertilizer separation is not taking place. As knives wear, inspect the seed row for compromised development of the seed shelf and fertilizer trench. In addition, an inspection of the knives themselves is required to ensure that a width of ½ inch is being maintained.

How to Set and Check the Airflow for Best Fertilizer Placement Without Plugging

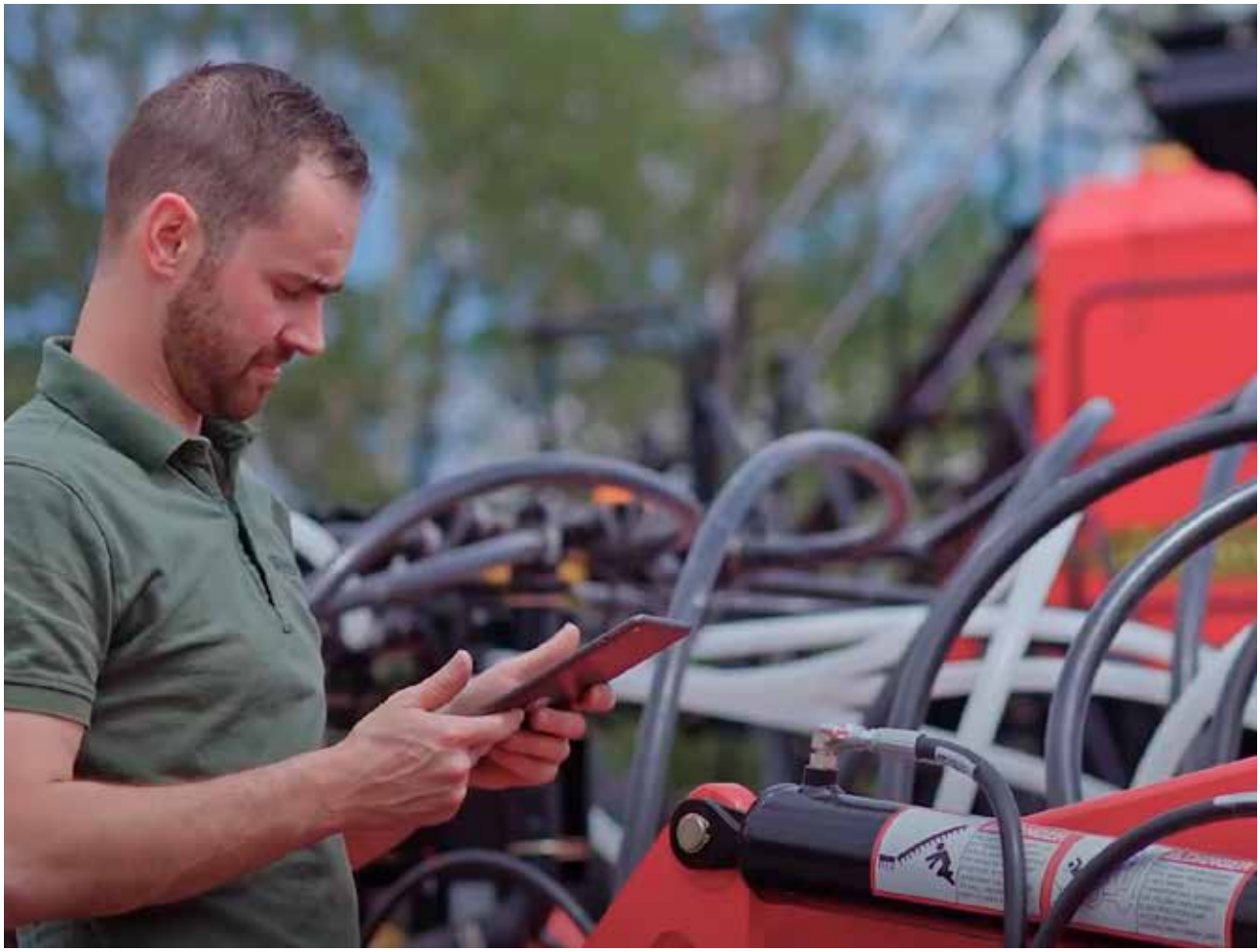
The test procedure outlined below, and in the PD Tank operator's manual, serves as a guideline for ensuring proper fan speed for effective delivery of product:

1. Remove hose(s) from an outside opener and temporarily attach to the frame of the seeder with the hose looping no more than 12" (300 mm) below the frame.

2. Begin seeding at normal field speed(s) and observe distance product discharges from hose(s) attached to the frame. All products should discharge within a range or 12" — 24" (300 — 600 mm).

3. Adjust fan speed, if necessary, to ensure optimum air flow for product discharge.

Additionally, check the furrow to ensure that fertilizer is remaining in its proper location in the fertilizer trench and is not blowing into the seed trench or on the surface of the soil itself.



What Product Look Ahead's are and How to Check Them in the Soil

Product Look Ahead's are the Sectional Control Technology (SCT) settings that determine when product rollers begin to meter product at the start of a drill pass and when they turn off at the end of a pass. These numbers are determined during calibration prior to seeding, however it is important to check drill passes at the beginning of the operation and periodically thereafter to ensure that there are no product gaps in the field or excessive overlap. Go to a seeded area of the field where the drill starts and ends a pass at a 90 degree angle to a previous pass, typically a headland, and inspect individual rows to determine if product is being metered into the previous pass or leaving gaps of unseeded soil in the field. Adjust settings in the control system as necessary.

How to Set Up the Drill in Different Soil Conditions

The ideal settings for drill operation will vary greatly depending on the soil conditions that are encountered during the course of the year. Dry conditions typically require higher packing pressure while wet conditions require less. In dry soils it is advised to increase packing pressure to the highest levels to help seal in soil moisture, especially in lighter soils. In heavier soils, especially with variables such as soil clods, heavy residue and rocks, higher packing pressure is required to maintain consistent seeding depth which is very important when moisture levels are reduced.

Higher moisture levels in heavier soils that produce muddy conditions may require higher packing pressure to shed mud. It is important to be mindful of overpacking in these conditions, upon which the use of mud scrapers is advised. Doing so will also improve consistency of product depth.

Which Knives are Best for What Crops

Seeds that are smaller in size, such as canola and flax, are more prone to movement within the seed trench, even at a relatively narrow width of ½ inch. Because the ISB knife shoots the seed into undisturbed soil as opposed to a trench that has been packed by the seed knife, lighter seeds remain in a consistent row on the left side of the side band. Cereal seed results in strong performance in all three knives; if a grower is looking to facilitate higher cultural weed control from crop shading especially with cereal crops, a narrower row spacing with the TW knife is desirable.

Furrow Characteristics and Toolbar Operation Around Curves

The packer tire bulges slightly to provide uniform packing over the seed and fertilizer trenches. This leaves the seed 3/4 inches (19 mm) below the curved path left by the packer wheel. Creating this furrow improves germination and growth in several ways: moisture is channeled into the path of the packer tire and the knives leave a dark strip that allows quicker soil warm-up than the surrounding reside-covered soil. When seeding around curves and corners, the packer wheel moves out of the furrow and rides up on the hard, undisturbed furrow shoulders. This results in a greater concentration of packing pressure on the shoulder as opposed to the seedbed itself. Fertilizer placement is also adversely affected along with reduced packing. It is advised during planting operations to seed in a straight path as much as possible. It is also important to turn right as much as possible to reduce the potential of fertilizer moving into the seed row.

What to Watch Out For in Soft Soil Conditions such as Peat or Sand

In soft soil conditions it is especially important to check product depth to ensure that it is not being seeded deeper than desired. Maintaining depth in these conditions requires more attention paid to packing pressure, ensuring that the chains on the opener remain tight while avoiding over-packing.

Final Thoughts

Spring planting is the operation that sets the parameters for the success of the entire crop year. The greatest potential of seed and fertilizer is at the time that it is in the cart waiting to be delivered to its final position in the soil by metering, air stream and opener placement. While a grower cannot control environmental factors such as moisture, sunlight and temperature, greater optimization of seeding operations gives the crop a much greater chance of success in the conditions faced during the season. It is this agronomic stewardship that provides greater risk management to a farming operation and continued success well into the future.

Reliable and durable farm machinery

1
Year
Warranty

*Entire machine comes with 12 month or 25,000 acres warranty from Warranty Start Date.**

3
Year
Warranty

*Frame structure comes with 36 month or 25,000 acres warranty from Warranty Start Date.**

** Warranty valid period is whichever limit occurs first.*

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