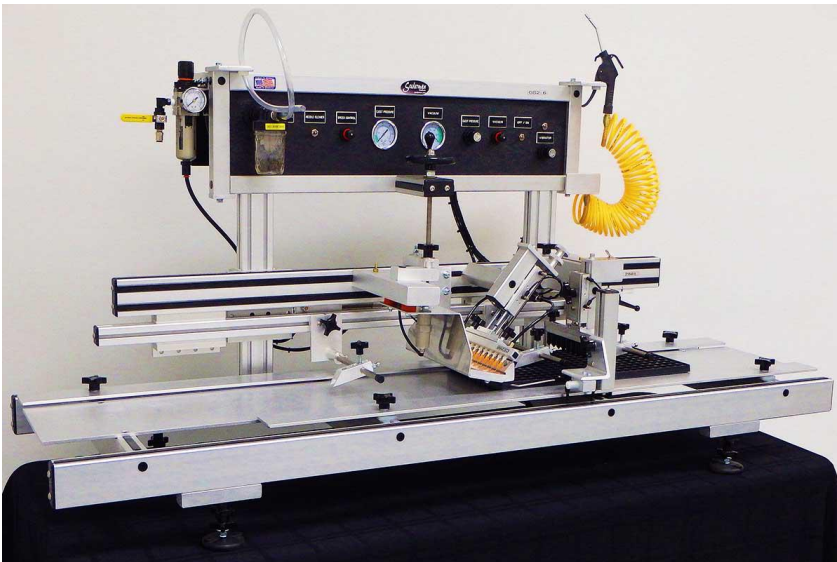
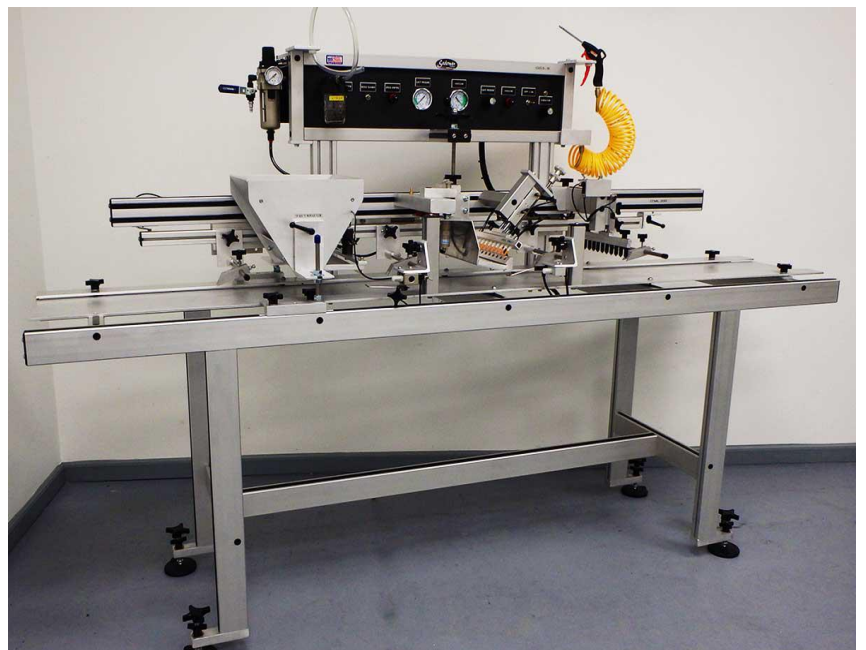


GS2/GS3 Automatic Needle Seeder



Owners
Manual and
Operating
Guide



GS2/GS3
Owners Manual and Operating Guide
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Introduction

The GS2 and GS3 models are operated in the same fashion. The differences between the two are that a GS3 model is standard with a leg kit eliminating the need to place the machine on a table, and the GS3 is standard with a dibbling unit. The GS2 machine can accommodate a dibbling unit, and both machines can also be fitted with a Vermiculite dispenser.

The GS2 and GS3 Automatic Needle Seeders were designed for the small greenhouse grower, but are also suitable in a larger growing environment.

The speed at which these machines will sow varies greatly upon several factors including:

- Size of tray,
- Seed type,
- Operator.

You should expect to sow UP TO 180 size 288 trays, or 120 size 512 trays per hour.

This machine will accommodate plug trays from 50 to 512 cells. The operator can change the sowing kit from one plug tray to another in less than 5 minutes.

Seederman has designed these popular machine in various sizes to meet growers demands for additional options (such as dibble bar and Vermiculite dispenser), and to allow for more trays across the table.

Seederman offers a 2 year warranty on all parts (except needles).

Space, environment and air requirements

The GS2 Automatic Needle Seeder is designed as a tabletop model. The space requirements are as follows:

Length = 6.5' to 10'

Width = 32 inches

Height = 28 inches

Weight = approx. 100 lbs. for 6.5'

A sturdy working table allowing at least 4 inches in excess of length and width is suggested to support this machine. The table should be able to withstand the weight of the machine and 3 filled trays at a minimum.

As this machine is manufactured using high-grade aluminum it is perfectly capable of withstanding the hot and humid conditions of most greenhouses, however you should avoid running this machine in or under a water source.

The GS2 and GS3 Automatic Needle Seeders were engineered to operate using only compressed air as its source of power. **No electricity is required.** This machine requires 80 PSI at 5 CFM to operate all components.

Connecting the air source

Connect your air source to the regulator connector being careful to make a secure connection. The gauge is preset to 70 psi. If the fitting that comes with the machine is not correct to your air source, you can purchase a 1/4 inch NPT fitting at most supply stores.

The regulator is located at the top of the masthead on the left side as the operator is facing the machine.

The regulator is auto drain but please note, this is not a water drain, it is designed to reduce moisture.



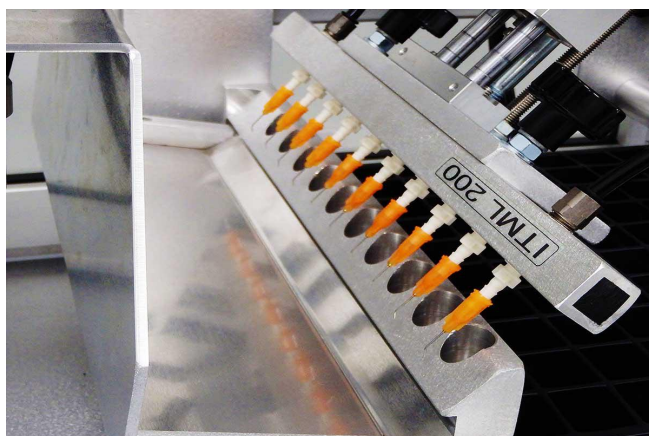
Figure 1. Filter regulator in off position. Airline connects to fitting below blue handle.

Inserting Needles

Your machine came equipped with a set of needles. Each needle has qualities that are more suited to different types of seed. Below are some examples of seeds and the needles you should use for each. Use this as a general guide to help determine the proper needle for the seed you are sowing. If you have questions, or need another needle size, please contact us.

Color	Size	Seed type
Clear	.008	Petunias, Dusty Miller, Coleus
Red	.010	Impatiens, Tomatoes (small), Carnations
Orange	.013	Marigold, Salvia, Vinca, Peppers
Blue	.016	Alyssum, Kale, Zinnia, Dahlias, Pansies
Purple	.020	Geraniums, Pelletized seed, Brassicas
Pink	.023	Large palletized seed
Green	.033	Cyclamen, cucumber
Amber	.054	Squash, zucchini

*Figure 2.
Needle
bar, drop
tube and
seed pan.*



Insert needles into the tip on the needle bar insuring tips of needles are facing vertically in the down position. Do not use undue pressure to insert needle into tip as it may cause the tip to break. If needle does not insert easily, inspect needle and tip for debris or damage.

Your kit comes equipped with extra needles and needle tips. Replace if necessary. Tips are screw mounted, needles are push mounted. If you need additional needles or tips, please contact us.

When using multiple needles per cell, position outside needles slightly inward to ensure accurate sowing.



*Figure 3. Inward position for
multiple needles per cell.*

Attach the sowing kit

Before changing a sowing kit, the air source should be disconnected from the machine and all excess air should be released by using the attaching air gun.

The sowing kit is comprised of a drop tube bar located at the base of your machine, and a needle bar. If a dibbler unit was ordered with your machine, your sowing kit will also include a dibble bar. Each kit is specific to a certain tray.

The bottom drop tube bar has one handle mounting it to the rear of the machine. To change the drop tube, grasp the drop tube to steady it, and with your other hand turn the handle counter-clockwise until the tube is released. To attach a new tube, line the tube up with the handle, grasp the tube and turn the handle clockwise until tight. Make sure when attaching a new tube that it is square to the seed pan, and flush to the back of the machine.

The needle bar is located just above the drop tube bar. To remove the needle bar, first disconnect the two air hoses from the front and rear. The air hoses are equipped with a quick-release fitting. To release, push the ring at the connection toward the fitting (away from the hose), and the hose should release. DO NOT PULL ON THE HOSE. After disconnecting the air hoses, you can remove the needle bar from the assembly by unscrewing the two handles at the top of the bar, one on the front and one on the rear. To attach a new needle bar, line it up with the two handles and tighten each, then connect the air hoses by inserting the hose into the fitting.

The needle bar height may need to be adjusted so that the tips of the needles fit just inside the seed pan. Adjust the height by first unlocking the outside thumbscrew, then turning the inside thumb screw to raise or lower.



Figure 3. Two thumb screws to adjust height of the needle bar.

Leveling the machine

To insure maximum precision seeding of your trays, it is necessary to insure that your machine is level on each surface that you place it. The machine is equipped with locking leveling pads to aid in leveling.



Figure 4. One of four leveling pads located at each outside corner of base of machine.



Figure 5. Seed in pan showing properly leveled machine.

The best way to level this machine is to place a small amount of round seed into the seed pan, turn the vibrator on, and watch where the seed locates itself. It may be necessary to adjust the amount of vibration by turning the vibrator knob to the left or the right. The seed should lightly "dance" over the surface of the pan without undue bouncing. A properly leveled machine will distribute the seed forward of the pan (near the needles) and evenly from front to back with the majority of the seed centrally located. If the seed needs to be centered across the width of the seed pan, use the leveling pads on the front or rear of the machine. If the seed is falling to the rear of the seed pan (away from the needles) the problem is either the degree of vibration or the leveling pads on the left hand side of the machine. If the seed falls too far to the back of the machine, raise the rear leveling pads. If the seed falls too far forward of the machine, raise the front leveling pads.

The leveling pads are equipped with a locking handle. To adjust the pads, first turn the bottom handle counter-clockwise to unlock the pads. Then raise or lower the foot with the top handle. When the foot is the correct height, turn the bottom handle clockwise to re-lock the pad.

Checking the Index length

Make sure the air is not connected to the machine before changing the indexing length. The first step is to calculate the length of the index- which is roughly 1 ½ cell lengths. For example, if you are using a standard 512 cell tray – the length of stroke is approx. 1", and a standard 288 cell tray is approx. 1 ¼". It is not necessary to determine the exact length, but you need to insure that the push bar clears the wall of the next cell. To adjust the stroke length, pull the handle toward you and release to lock. Slide the stroke to required length and push handle away to lock the handle in place. Measure the gap between the end of the cycle bar and stop bracket to the length that you determine to be 1 ½ cell lengths.

To check the indexing length, manually slide the stroke to adjust assembly forward and backward and note that the push bars index at least one full cell, and no more than one cell. Do not be concerned if the push bar ends in the center of the cell.



Figure 6. Stroke assembly showing gap between handle bar and bumpers.



Figure 7. Tray is properly set up with first cell directly under drop tube, indexing push bar is set to forward wall of cell. In the foreground is the stainless steel vacuum actuator

The next step is to adjust the indexing push bars. To do this, first line the tray up so that the first cell is directly under the drop tube bar. Next, unlock the indexing push bar on the right hand side of the machine and slide it right or left, until the prongs of the push bar are up against the forward wall of any cell. Once the right hand push bar is set, then offer the tray forward (left) to the left hand push and repeat to adjust.

Adjust height of sowing assembly

You will need to adjust the height of the machines working parts to fit the height of the trays you are using. To adjust the height of the entire working assembly (seed pan, drop tube bar, and push bars), first raise the assembly



to make sure that it will accommodate the height of the tray, slide the tray under the drop tube arm, then lower the assembly so that the drop tube sits just above the tray with no more than 1/8" clearance of the tray.

The height adjust arm is raised and lowered with a single mechanism at the center of the machine. There are two handles on the assembly, the lower handle locks the assembly and the upper handle raises and lowers it. First unlock the assembly by turning the lower handle to the left, then using the top handle raise or lower the mechanism to the desired height. Relock the assembly with the lower handle before operation.

The machine will be set to the proper index length, and height, and all working components are proper seated to fit the tray you are using.

Figure 8. Height adjust arm with lower locking handle and upper adjusting handle.

Operating the Machine

Before beginning operation, complete the following checklist:

- The machine is in the OFF position.
- Seed is in the pan and the machine has been leveled.
- The correct sowing kit has been attached.
- The correct needles have been inserted to match the cells.
- The rails have been adjusted to the correct width for the tray.
- The indexing has been adjusted to the correct length.
- Air is connected to the machine.

The machine control panel is shown below, from left to right across the top of the machine.



Figure 9. Seed collector switch, needle cleaner switch and speed control.



Figure 10. Vacuum gauge.



Figure 11. Eject pressure gauge.



Figure 12. Eject pressure knob, vacuum knob, on/off switch, and vibrator switch/control knob.

Begin by turning the vibrator on and adjust as needed noting where the seed is collecting in the tray. Next turn the machine main off/on switch to the on position. Adjust the vacuum and eject pressure to the correct gauge readings. Offer tray to the first indexing arm and allow the machine to carry the tray through the machine. Repeat sowing of additional trays.

After you have finished sowing all your trays, you can use the seed collector to neatly and completely collect any remaining seed left in the pan.



Figure 11. Seed collector & switch.

The seed collector is located on the operator's panel at the left hand side. Turn the vibrator pan on, as it is easier to collect the seed while vibrating. Remove the hose from the holder, and turn the knob counterclockwise until you hear vacuum pressure in the hose. Place hose into seed pan and vacuum seed until all is removed.

To remove seed from seed collector, grasp the lower (clear) container and turn in clockwise until it separates from the unit.

Cleaning the Needles

If a seed, soil, or other debris should collect in the needle and block it, this machine is equipped with a needle cleaner.

Remove the blocked needle turning counterclockwise. Place needle onto needle cleaner located at the base of the operator control panel in the lower right corner.

Hold needle into place but **DO NOT PUT FINGERS OR HANDS ON TOP OF THE NEEDLE** as it is positive air and can cause injury. Proceed to turn the needle cleaner switch located on the control panel to the active position. Within a few seconds, debris should be clear from the needle.

If the needle fails to clear on the needle cleaner, it may be necessary to soak the needle in warm water for about one hour, then try cleaning it on the needle cleaner again. The needle cleaner is located at the back and to the right of the machine to prevent any blowing debris from blowing into operator's eyes. For this reason, operator should not move from his normal operating position when cleaning needles.



Figure 12. Needle cleaner switch.



Figure 13. Needle cleaner located at base of operator panel

Setup and Operation – Dibbler

Your machine may be equipped with a dibbling unit. It is necessary to setup the dibbling unit specific to each tray.

Position the tray as shown in Figure 7 on Page 8. Release the lock handle on the rear slide mount of the dibbler and manually slide the dibbler assembly to the left or right to position the dibbling tips to the center of the cells in the tray. Lock the handle into position.

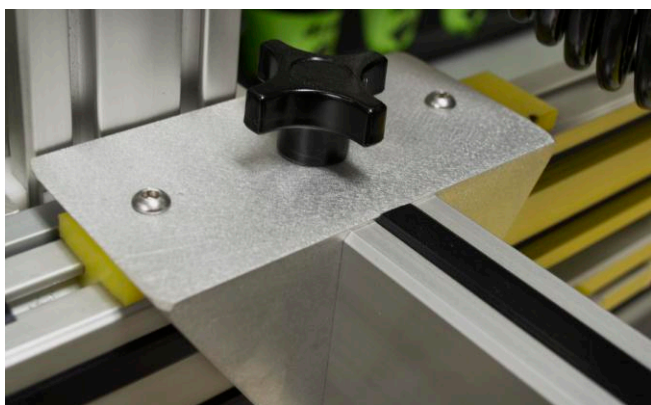


Figure 14. Rear slide mount of dibbler assembly and locking handle.

To change the depth of the dibble impression in the soil, loosen the lock handle on the dibble cylinder and slide the cylinder up or down, then relock the handle



Figure 15. Dibble cylinder and lock handle (flat cylinder attached to upright assembly arm). Dibbling bar and pins with both locking handles are directly under cylinder unit.

To change the dibbling section of the sowing kit, unlock the two locking handles on either side of the top of dibbling bar mount to release the bar underneath. Replace the bar with that of a different sowing kit, and relock the handles. The locking handles on the dibbling bar mount were machined so that the dibbling bar can be positioned exactly over the center of the tray width.



Figure 16. Dibbler on/off switch.

On the top of the dibbler support arm is an on/off switch. This will allow you to easily operate the machine without the dibbler without having to remove the dibbling bar.

Vibrator Lubricator

When first receiving your needle seeder, you will notice a vibrator lubricator on the operator's right side of the control panel. This must be filled to the appropriate level with the oil provided.

Pull down the tab at the front of the lubricator, pushing up on the bowl and twisting 1/8th of an inch clockwise until the bowl releases. Fill with the provided oil until the level line marked on the side of the bowl is met. Replace the bowl on the mount ensuring the tab is firmly in the original position. Once this is complete, check that the rubber "O" ring is in place on top of the bowl.

DO NOT calibrate the lubricator without first contacting Seederman first, as this may be detrimental to the function of the machine.



Figure 17. Vibrator Lubricator locked in position.



Figure 18. Vibrator Lubricator showing tab unlocked.

Replacing Sensors

The most common issue customer's encounter with parts on their needle seeder is an air fitting called a "sensor". These sometimes need to be replaced, but life expectancy can vary greatly.

Before replacing a sensor, clean the area with the air gun on the operator's right side of the control panel to make sure there is no debris or contaminant on or in the tubing. Attach the provided label marked "P" to the air tube leading to the "P" section on the sensor before removing, as this will ensure the airlines can be replaced into the correct section after installation.

Remove the air tubes by pressing the black ring at the end of the sensor fitting and gently pull away. These can sometimes be stiff. With the use of a wrench, remove the sensor from the cylinder and replace with a new sensor. It is not necessary to use thread lock on the fitting from the sensor to the air cylinder.

Replace tubing ENSURING the line you have previously marked with "P" goes back into the "P" section of the sensor.



Figure 19. New sensor showing S & P airline sections and "P" label.

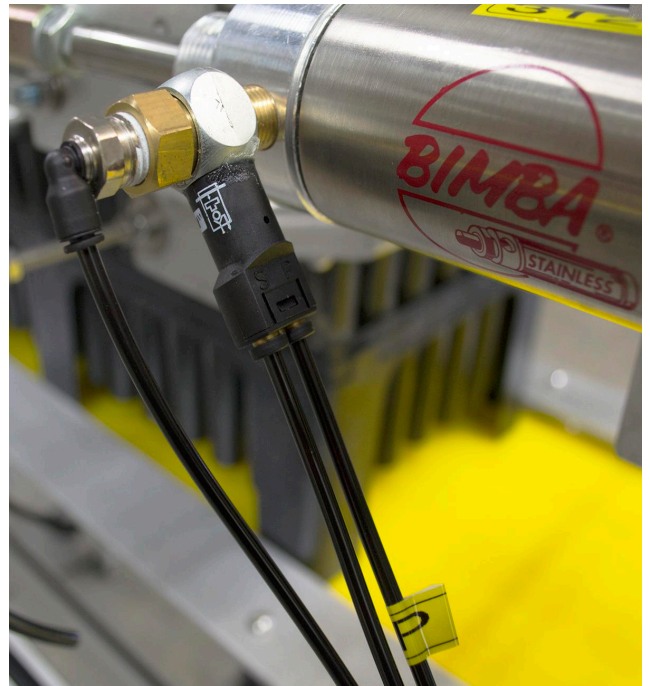


Figure 20. "P" label placed on correct "P" airline before sensor removal.

Maintenance

Your seeder will require very little regular preventive maintenance. We have outlined maintenance items you should perform and should not perform, as well as a checklist you should go through before each operation and at the beginning of each season.

Prior to first use and at the beginning of each season...

- Remove the panel from the back of the machine.
- Check all fittings to insure they are secure and replace panel.
- Check regulator for moisture and release if necessary.
- Check regulator connection for debris and remove if necessary.
- It may be necessary to clean drop tubes if they are dirty. Some pelletized seed can leave a chalky residue behind. To clean the tubes soak them in a small amount of mild detergent and let dry completely before use. Note that some operators have found that a small amount of residue from seed (even pelletized) actually assists the seed dropping through the tube even faster, so you may want to try the tubes first.
- Check bolts, and handles to insure they are secure.

Prior to each use...

- Connect air and check vibrator, vacuum pressure, eject pressure and seed cleaner pressure to insure that all air hoses, gauges, and regulator are working properly.
- Spot check drop tubes, seed pan, needles, and needle tips for debris and clean if necessary.

After each use...

- Collect all empty seed and empty seed container.
- Using air gun, clean the machine of all dirt and debris.
- Disconnect air hose from regulator.
- Release all pressure in regulator using air gun.
- Remove needles for safety.



Figure 21. Air gun

Remove the air gun from the holder at the upper right corner of the operator's panel. Grasping gun, use index finger on trigger to activate air through gun.

After each season...

- Prepare machine as indicated in "after each use".
- Store machine in clean dry area and cover with drop cloth if necessary.
- If you have a GS3-HD, it is advisable to rotate yellow UHMW rails to allow an even amount of wear. Rails unscrew using Allen wrenches (see Fig 22).



Figure 22. Unscrewing UHMW bed to rotate rails for even wear.

Do not do...

- Do not lubricate machine in any way. If you feel there is a part that is sticking, please contact us and we will direct you how to fix it, or make arrangement for repair. This machine should not require any lubrication.
- Clean seed pan except with seed collector. If necessary you can use a clean cloth or paper towel to wipe out seed pan. Do use any cleansers in or on seed pan. If you do spill for example coffee into seed pan, wipe seed pan out with clean cloth using water only.

If a sticky liquid is accidentally spilled into pan, it may be necessary to clean with a small amount of mild detergent – dip a rag into solution then clean pan, then rinse pan with clean water. Always make sure pan is dry before use.

Please do not feel it necessary to repair your machine yourself if something should break. Please call us as most of the time we can talk you through a minor problem or repair over the telephone. If the repair is more serious, we can make arrangements to have your machine repaired.

Check your machine a few weeks before your sowing season begins to make sure that everything is in proper working order.

Safety precautions

There are few areas on the GS1 that you should be cautious about when operating the machine.

Compressed air can be dangerous. Caution should be exercised when connecting and especially when disconnecting air hose fittings. Stand well away and do not directly face the connector when connecting or disconnecting fittings. **Do not place hands over compressed air supply.** Insure all fittings are tight and leak free, if there is a leak in any fitting; discontinue use of the machine until repaired.

Needles are sharp and will puncture skin. The needles supplied with our kits are surgical grade needles and can puncture skin. Operator should use caution and not place hands or other body parts near needles during operation of machine. When the machine is not in operation it is suggested that needles be removed not only for safety reasons but to keep needles clean and free of debris. Care should be exercised in handling needles when off of machine. Needles should be kept in a safe place away from children.

There are pinch points on this machine. Caution should be exercised to avoid placing hands or other body parts on or near the indexing arm or the indexing cylinder. Also, keep fingers and clothing out of the way when adjusting the side guide rails (see figure 3) to avoid pinching when moving these into position.

Use air gun safely. Do not point air gun at yourself or others. Pressure from air can cause serious injury.

Use seed collector safely. Do not press seed collector up against any part of your body as vacuum pressure could cause injury. Do not use seed collector to vacuum anything other than seed as it may damage unit.

As with all machinery, operation should not be conducted while under the influence of alcohol or other drugs that can impair vision, memory, coordination, or judgment, nor should one operate the machine under duress of fatigue, or working conditions that would impair mental or physical faculties. Machinery should never be operated by children.

Owner should insure that all operators have read or are aware of all operating instructions and safety considerations before use.

Contact

Should you need any assistance, or have any questions about your Seederman Seeder, please contact us.

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