

WeedSeeker®

Installation and Operation Manual

WeedSeeker® Sensor

Model 650 & 655

WeedSeeker® Controller

Model 150, 151, 153



740 South State Street Ukiah, CA 95482
www.ntechindustries.com

888.728.2436

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Parts Catalog	500-1-020

Introduction

Congratulations on your purchase of a WeedSeeker® Automatic Spot Spray System. WeedSeeker Sensors are an innovative leap in precision spray application and weed control. They are manufactured and tested to provide many years of dependable service, enhanced weed control, long term cost savings, and reduced environmental impact resulting from reduced application of chemicals.

Technical Summary

A WeedSeeker® Sensor consists of an internal dual-wavelength light source, an optical detector and optics module, and an electronics module. Its operation is based on the fact that every substance has a unique spectral reflectance signature. The Sensor is optimized to compare the reflected light from soils and plants. The presence of *chlorophyll* in plants results in a distinct reflectance signature at particular wavelengths as compared to soils (and concrete, asphalt, etc). The Sensor compares the reflected light at two different wavelengths. When a plant comes into the field of view, the circuitry “recognizes” the chlorophyll signature and activates the extremely fast solenoid valve inside the Valve Cartridge, which sprays the chemical on the plant or sends a signal via the Valve Driver Cartridge to an external solenoid.

Operating Instructions

Open the lid of the Controller to gain access to the front panel. Refer to the Controller section of the manual for an explanation of the functions.

Starting Up

- Verify that the **FLUSH** switch is **OFF**. Turn on the pump and set the desired pressure (50 psi maximum).
- Turn the **POWER** switch **ON**. The **WARM UP** indicator will flash for approximately 20-30 seconds while the electronics reach the proper operating point.
- During the warm up phase, make initial adjustments to the system for **SENSITIVITY** and **SPEED**. Use 3 or 4 as a good starting point for **Sensitivity**. Then adjust as necessary in the field. At too high of a setting, the Sensor will miss small weeds. At too low of a setting, it will be too sensitive.
- Set **SPEED** to “LO” for 3-5 mph, “MED” for 5-7 mph, and “HI” for 7-10 mph. If the vehicle speed is unknown, set **SPEED** to **Medium** and adjust as necessary once you start spraying.
If the spray pattern falls *before* the weed, *reduce* the **SPEED** setting.
If the spray pattern falls *after* of the weed, *increase* the **SPEED** setting.
- When the **WARM UP light** goes off the Sensors will be in **STANDBY** mode. Calibrate the Sensors for the specific soil or pavement type. Position the Sensors over a completely weed free patch of ground and press the **SOIL BASE** switch momentarily. For best results, set the soil base in the field.
- Press the **STANDBY** switch to change the Sensors from Standby mode to Operational mode; the **STANDBY** light will turn **OFF**. The **SOUND** switch may be **ON** or **OFF** as desired (Refer to the Controller section of the manual for further details).
- Verify the operation of each Sensor by waving a weed (or a leaf) under each Sensor to confirm that each unit sprays. **AVOID CONTACT WITH THE CHEMICAL SPRAY; FOLLOW SAFE AND PROPER CHEMICAL HANDLING PROCEDURES.** If there is a problem with a sensor recognizing the weed, check the sensitivity setting. If the problem persists, refer to the *WeedSeeker®* Troubleshooting Manual.

You are now ready to begin spraying.

Operating

Press the **SOIL BASE** switch to calibrate whenever soil conditions change. Do this over a bare (weed free) area of ground. For best results, set the soil base at or near the area to be sprayed.

Check periodically (Recommended at the beginning of using the sprayer and at a convenient time during the day such as lunch or during tank refill) that all WeedSeeker® Sensors are working properly. Turn on the **FLUSH** switch, and verify that all valve cartridge LED indicators are on and each nozzle is spraying. Stop the vehicle if necessary for this step.

At the same time, check the Detector and Light Source windows on the underside of the Sensors. If they are dusty or dirty, use a soft dry rag to wipe them clean.

When traveling in an area that is not sprayed (i.e., between fields), switch to **STANDBY** to pause operation of the Sensors.

If the sprayer has a boom which is automatically lifted (such as on a Hooded Row Crop Sprayer), a lift switch can be added to remotely switch the sensors to **STANDBY** mode. The **Lift Switch** light comes on when the Lift Switch is activated. When the boom is lifted, all the Sensors are automatically put in standby to avoid inadvertent spraying.

Caution: *The sensors are susceptible to interference from some cell phones and two-way radios. If operating a radio communication device near the sensors, please be aware that the sensor valve may activate and spray. If in an area where this would be a problem, it is recommended to switch the system to **STANDBY** to avoid erratic spraying.*

System Components

WeedSeeker® Sensor

The Model 650/655 WeedSeeker® Sensor contains sophisticated electronic and optical components and is environmentally sealed to protect the integrity. Each Sensor weighs 2.75 pounds. An integrated mounting bracket allows easy assembly to a spray boom. Fig. 1 identifies the key parts of the Sensor.

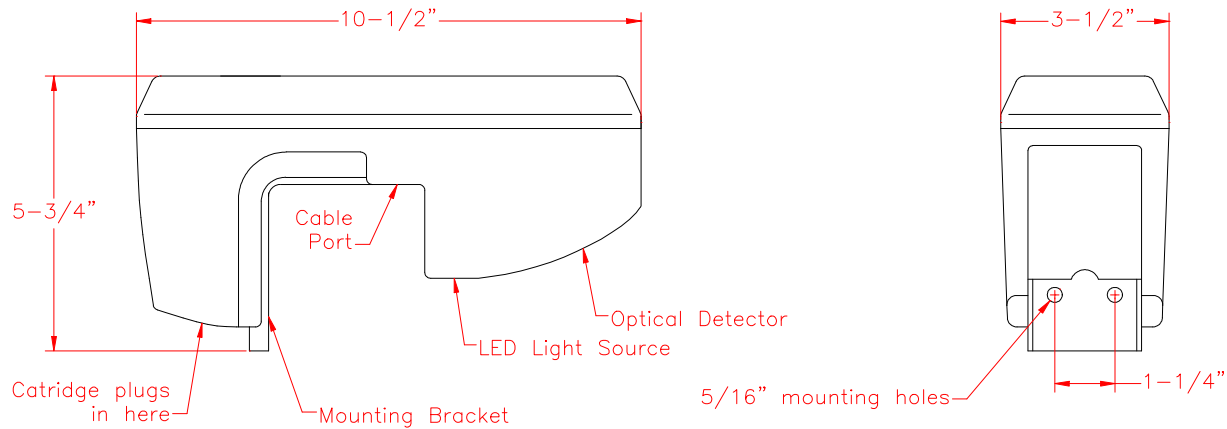


Figure 1. Identification of the key parts of the Sensor.

- The Optical Detector is at the front of the sensor. Positioned slightly behind the Optical Detector is the LED Light Source—a precision array of LEDs. The LEDs emit a modulated light signal, and the Detector reads the reflected light signal. *Note: the emitted light is not hazardous to look at directly.*
- When a plant is present, the Sensor circuitry activates the valve cartridge or external valve which will dispense the chemical.
- Electrical connection is made to the Sensor via a 12-pin cable to either of its two Ports.

Mounting Height

- Model 650: When mounted between 18”-30” from the ground and pointed straight down, the Sensor has a Field of View of 13” ± 0.5”. (When mounted at an angle, the Field of View will increase, depending on the angle.)
- Model 655: When mounted between 24”-30” from the ground and pointed straight down, the Sensor will have a Field of View of 16” ± 0.5”. (When mounted at an angle, the Field of View will increase, depending on the angle.)

Valve Cartridge

The Model VC01 Valve Cartridge (Fig. 2) consists of a ¼” hose barb brass inlet (incoming fluid), a spray nozzle, a nozzle cap, an LED indicator, a 3-pin electrical connector, and two captive screws.

The Valve Cartridge is designed for application of most water soluble chemicals. *Use of wettable powders or other non-water soluble materials will cause the solenoid to fail and void the warranty of the Valve Cartridge.*

The chemical from the tank enters through the inlet and is dispensed through the nozzle. The LED indicator is lit when the solenoid is open. A metallic “click” can be heard when the solenoid is energized.

The Cartridge plugs into the cavity at the rear of Sensor. The solenoid and Sensor are slotted to ensure proper alignment. Two captive screws hold the Cartridge in place.

Inside the cartridge are a solenoid valve, a magnetic filter, and a small circuit board. The circuit drives the solenoid and the indicator LED.

The internal filter is #160 mesh. The filter and magnet prevent sand, non-dissolved chemical material and magnetic particles in the fluid from clogging the solenoid valve.

It is important that the cartridge is flushed after each day of use with fresh water. The fresh water source is located on the sprayer (shown in Fig. 6) or by connecting to a fresh water hose. Failure to do so allows excessive build up of particulate matter and chemical residue on the valve seat.

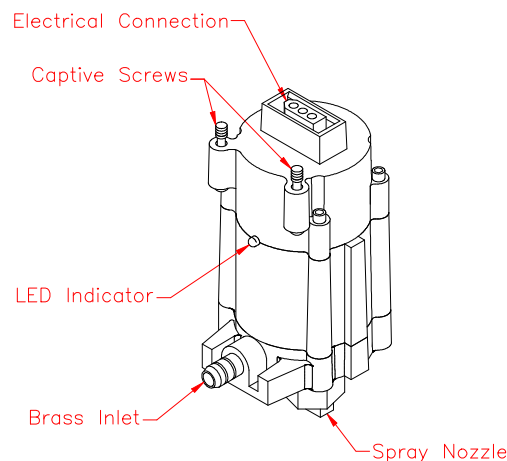


Figure 2. The Valve Cartridge (Model VC01) contains a high-speed solenoid valve, with a ¼” brass inlet and spray nozzle. A 3-pin connector mates the Cartridge to the Sensor.

Nozzle

A threaded nozzle cap attaches the spray nozzle to the base of the Valve Cartridge. The spray nozzle provides an optimum spray pattern which matches the field of view of the Sensor. The TP6502 nozzle is standard; however special applications may require other nozzles.

Nozzle	Spray angle (degrees)	Flow rate (gpm) @ 40 psi	Width @ 24"
TeeJet™ TP4002*	40	0.20	12"
TeeJet™ TP6502	65	0.20	15"
TeeJet™ TP6502E**	65	0.20	15"
TeeJet™ TP6503	65	0.30	15"
TeeJet™ TP6504	65	0.40	15"

*Use when spraying under a narrow hood.

**Use the "E" version with the Model 655 WeedSeeker to obtain an even spray pattern to match its wider field of view.

Valve Driver Cartridge

The Valve Driver Cartridge (VDC05) is used instead of the VC01 in applications that require a valve that is larger or that must be located further from the Sensor. The VDC05 fits in the Sensor just like the VC01, but contains a valve driver circuit capable of up to 5 Amps at 12V.

When the Sensor detects a plant or weed, the VDC05 outputs an electronic signal of 12V. This signal is used to operate an external valve which in turn controls a spray nozzle or a bank of spray nozzles. The LED will turn on indicating that the cartridge is energized.

Fig. 3 shows the connections for the VDC05. The red wire is connected to the positive side of a 12 Volt (negative ground) battery; the yellow wire is connected to the external solenoid. The solenoid is then connected to the same ground as the Controller . A 10A fuse is recommended between the battery and the VDC05 as shown.

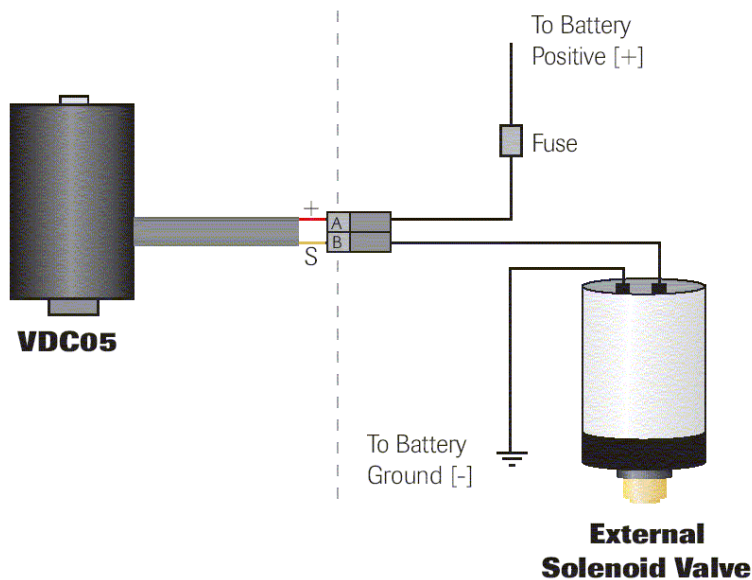


Figure 3. Valve Cartridge Driver Configuration

WeedSeeker® Controller

The Model 150 WeedSeeker® Controller operates up to 40 Sensors, with a maximum of 20 on a single port. The Controller should be mounted so that the operator can see the indicator lights and easily reach the switches while operating the vehicle.

To accurately spray a weed, the time delay to activate the Valve Cartridge must approximately match the vehicle's speed. There are three speed settings which the operator must set manually,* corresponding to speed ranges of

Low	3-5 MPH	(5-8 kph)
Med	5-7 MPH	(8-11 kph)
High	7-10 MPH	(11-16 kph)

When properly set, the spray will turn on slightly before the weed and turn off slightly after the weed.

**There is now an AutoSpeed capability for the Controller. By connection of some type of ground speed sensor, the speed setting will change automatically. Refer to Appendix A for details.*

The Soil Base Switch is toggled to calibrate the Sensors. What each Sensor is detecting instantly becomes a new background reference value (soil baseline). *Hint: Toggle the switch quickly. Holding the switch on does not improve the calibration.* As the sprayer travels through the field, each Sensor compares the current reflectance signal to the Soil Base value stored in memory. **Caution:** *if the Soil Base is set while a Sensor is over a weed, smaller weeds will not be sprayed; only weeds larger than the initial weed will be sprayed.*

A Remote Standby function is an available configuration (Model 151). A Lift Switch mounted on a boom (typically used on Row Crop Sprayers) and plugged into the multi-purpose input connector on the controller will activate the Standby Mode when the boom is lifted and the switch contact opens. This option is programmed at the factory or by the dealer.

The Model 153 Master Controller has the same control panel; however, the 153 is cabled to one or more Model 155 Line Controllers located out on the boom. Power is routed from the battery directly to the Line Controllers. Refer to the Installation Manual for Large Array Systems [500-1-016].

If Ground Speed Sensors or Lift Switches are part of the system, they are connect to the Line Controllers. *Note that a Ground speed Sensor may be connected to each Line Controller or shared among them as required by the application. The same is true for the Lift Switch.*

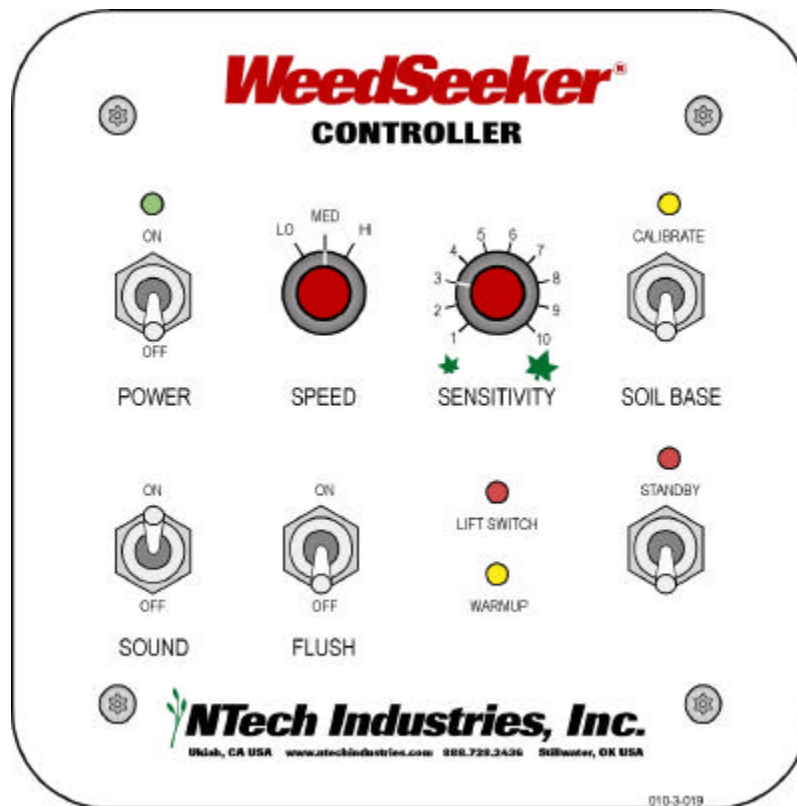


Figure 4. Controller Switch Panel

Function	Description
POWER	Switch turns all Sensors connected to that single Controller on and off. Sensor units do not retain settings in memory when turned off.
SPEED	Range to match vehicle speed. LO 3 to 5 mph; MED 5 to 7 mph; HI 7 to 10 mph.
SENSITIVITY	Adjusts the sensitivity of the Sensors for the size of weeds to be sprayed. A small number equals a small weed.
CALIBRATE (SOIL BASE)	Resets the background reference value of each Sensor. Select a weed-free spot to calibrate.
SOUND	Enables the beeper. This is a reminder that the system is in the Standby mode.
FLUSH	Energizes (opens) all connected Sensor valves.
LIFT SWITCH	Light is on when the standby mode has been activated by a remote switch.
WARM UP	Light is on when the Sensors are first powered up (about 30sec).
STANDBY	Pauses operation of all Sensors by directing the valves to close. The Standby LED will flash. Soil Base settings are retained while in Standby mode.

Electrical Connections

Connect the Controller directly to 12 Volts DC, usually the vehicle battery. The red (or orange) power lead goes to the positive battery terminal, the black one to negative. If available on the vehicle, the Power Cable quick-disconnect may be plugged into a reliable convenience outlet. The Controller must be fused. The fuse size depends on the number of Sensors connected to it. Systems with less than 14 sensors are supplied with a 7.5A fuse; larger systems use a 15A fuse.

Each *WeedSeeker*[®] Sensor draws 0.23A of current. The Controller draws 0.07A.

The individual Sensors are interconnected using daisy cables. The 12-pin connectors are keyed (there are two ridges on one wall of the plastic shroud) to be plugged in one way. *Do not force the connectors* or over-tighten the fastening screws. They will go in smoothly when aligned, though it takes a little while to get the hang of it. When they are completely plugged in, the fastener retainer will be against the Sensor, and should be turned to align the Phillips screws so they can be tightened.

In each section, cap the last Sensor's unused cable connector with the sensor plugs provided. Route the cables out of harm's way—away from hot or sharp objects and potential snag points. The cables and hoses must not obstruct the view of the Sensor's light source, detector, or the valve nozzles. Tie wraps are recommended.

Caution: *If welding on the tractor or sprayer is necessary, disconnect the power from the battery by removing both the positive and negative leads from the battery terminals.*

If welding on the spray boom is necessary, disconnect the power and remove the Sensor completely from the spray boom.

Single Boom Systems

Fig. 5a illustrates an example of a small, single boom system. The Controller distributes the power directly to the Sensors through one Controller Cable and Daisy Cables.

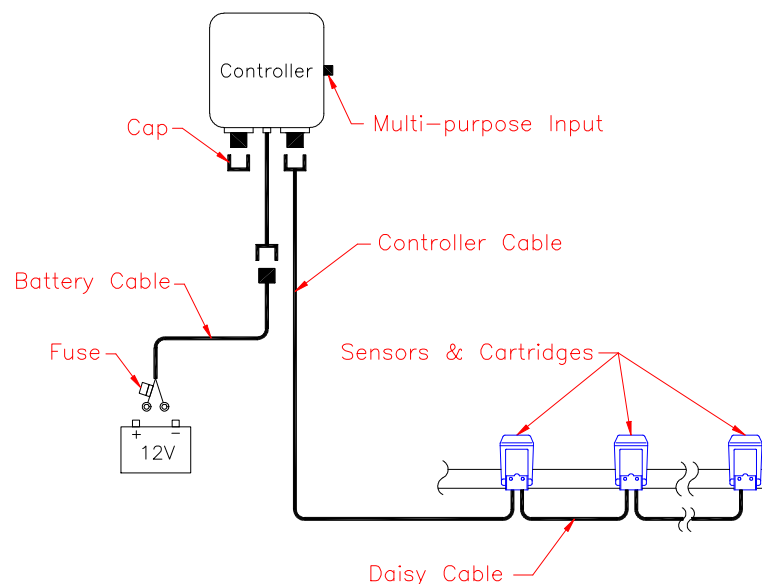


Figure 5a: Electrical Connections for Permanent Crop Systems - Single Boom

Double Boom Systems

Fig. 5b illustrates an example of a small, double boom system. The Controller distributes the power directly to the Sensors through two Controller Cables and Daisy Cables.

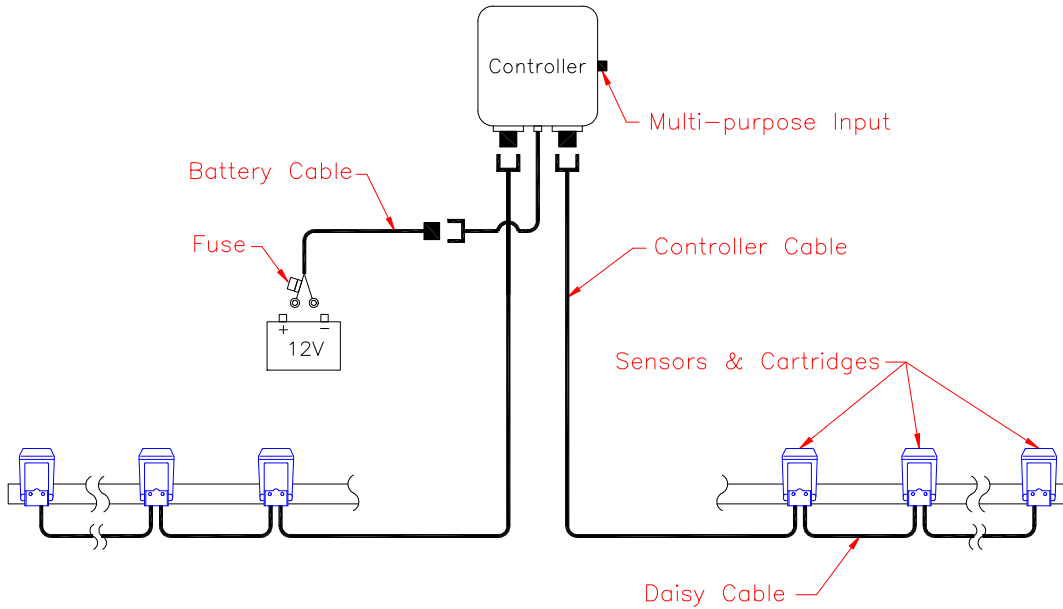


Figure 5b: Electrical Connections for Permanent Crop Systems - Double Boom

Row Crop Systems

Fig. 5c illustrates an example of a small, row crop system. The Controller distributes the power directly to the Sensors through the Controller Cables and the Daisy Cables.

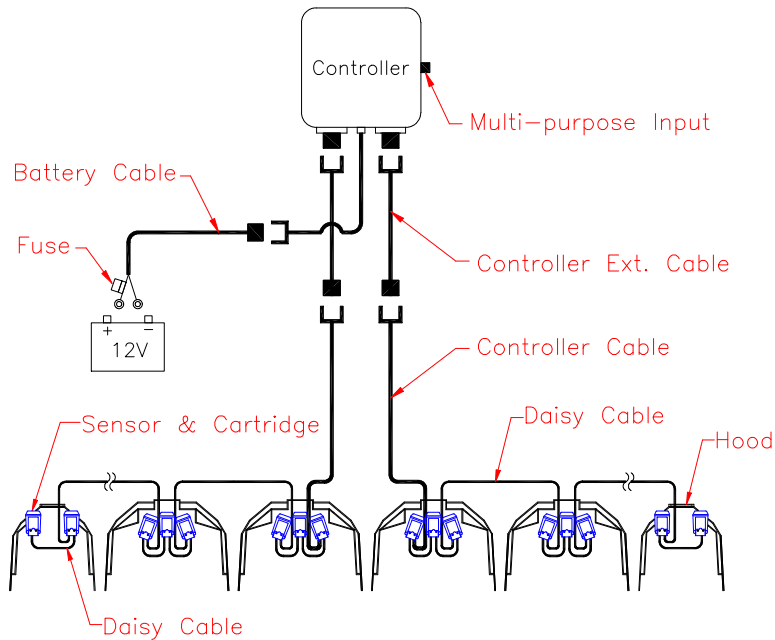


Figure 5c: Electrical Connections for Row Crop Systems

Plumbing Hookup

Fig. 6 shows the necessary plumbing for a *WeedSeeker*® System. In addition to the chemical tank, a clean water flush system is recommended. A mounted flush tank or fresh water hose connection can be installed in the plumbing system. With a three-way valve, chemical or fresh water can be selected to source the Sensor spray nozzles. When flushing the system, change positions on the “Return 3 Way Valve” to return fresh water back to the Fresh water Flush Tank to prevent dilution of Chemical in the tank.

A #100 mesh filter is recommended to protect the pump.

A #200 mesh filter must be installed between the regulator and the Sensors. Without this filter the cartridges will become clogged. In many cases the clogging will be severe enough that even back flushing will not unclog the valve cartridge.

The inlet line for each Sensor is 1/4” I.D. hose. The system connecting line should be 3/8 inch or 1/2 inch I.D. hose to ensure proper flow rates. To accommodate typical systems up to 12 spray units, we include 20 feet of 3/8” I.D. hose for ease of installation.

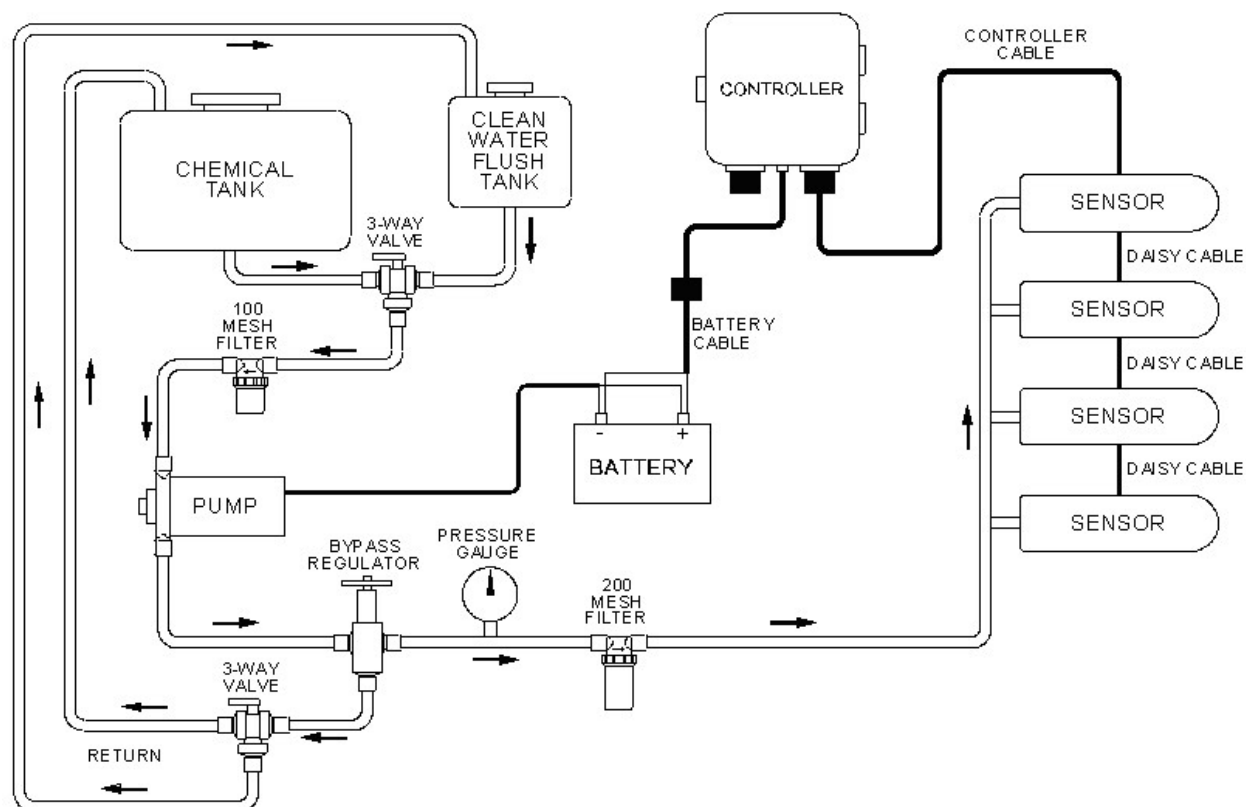


Figure 6. System Configuration that includes a fresh water tank.

Care and Maintenance

Proper care of your *WeedSeeker*[®] Automatic Spot Spray System is important to maintain high performance. At the end of each day of spraying, the following steps should be taken:

- Flush the entire system with fresh water at the end of each spray session. To do this, switch to your fresh water flush tank or fresh water hose connection, and turn **On** the **FLUSH** switch. This will clean all delivery systems of chemical residue.
- With the **FLUSH** switch **On**, check each valve nozzle. If a Sensor ceases to spray, but the valve LED lights are still operating, the valve is clogged. To back flush a valve cartridge, see the Back Flush Procedure in the Troubleshooting Manual. **Caution:** *Removing the inlet hose while there is pressure and chemical in the line is a potential safety hazard. Turn the pump off and relieve the pressure in the line before removing the inlet hose.*
- Check the Detector and Light Source Windows for dust and dirt, and wipe clean with a soft rag.
- The *WeedSeeker*[®] System should not be left outdoors during extreme weather conditions. Wide temperature variations are hard on electronics and fluid seals, and may reduce the operating life of the system. Storage in freezing weather may split the Valve Cartridge if not first flushed of its contents. **DO NOT store a WeedSeeker system with the Sensors facing upward.** Doing so may allow water to collect around the windows and gaskets, causing seal failures in those areas.
- **Caution:** The sensors are susceptible to interference from some cell phones and two-way radios. If operating a radio communication device near the sensors, please be aware that the sensor valve may activate and spray. If in an area where this would be a problem, it is recommended to switch the system to **STANDBY** to avoid erratic spraying.

If you experience operating problems, refer to the Troubleshooting Manual. Limit any fixes or repairs to those covered in the Troubleshooting Manual. *There are no field serviceable components of the electronic system; do not attempt any field repair of a malfunctioning Controller or Sensors.* Contact your local dealer or representative or NTech Industries for assistance.

Application of Warranty

To make a claim under warranty, contact the Dealer from which you purchased the system giving a description of the product and request instructions. **MERCHANDISE MUST NOT BE RETURNED UNTIL A RETURNED MATERIAL AUTHORIZATION (RMA) NUMBER IS ISSUED. EVIDENCE OF ORIGINAL PURCHASE MUST ACCOMPANY RETURN.** See the General Terms And Conditions Covering Sales.

Appendix A: AutoSpeed Option

The WeedSeeker® Model 150 Controller has an AutoSpeed Option. The WeedSeeker® system can operate at variable rates of speed without having to manually change the speed selector. By installing a speed sensing device to your spray vehicle and connecting it to the multi-purpose input connector on the controller, the proper speed range changes automatically as speed varies between 3MPH to 10MPH.

If the speed sensing device is disconnected, the Controller will revert to the speed setting of the SPEED switch on the Controller.

The new controller connects to a radar ground speed sensor, proximity pick-up or magnetic pick-up. The speed selector is then updated constantly to keep your detection and spraying right on target.

The new controller must be configured to the specific type of speed sensing device. Compatible ground speed radars include the MID-TECH II radar (57.4Hz/MPH), the DICKY-john radar (44.1Hz/MPH), and the SkyTrak GPS-based sensor (58.2Hz/MPH). It is also configurable for specific proximity pick-up systems.

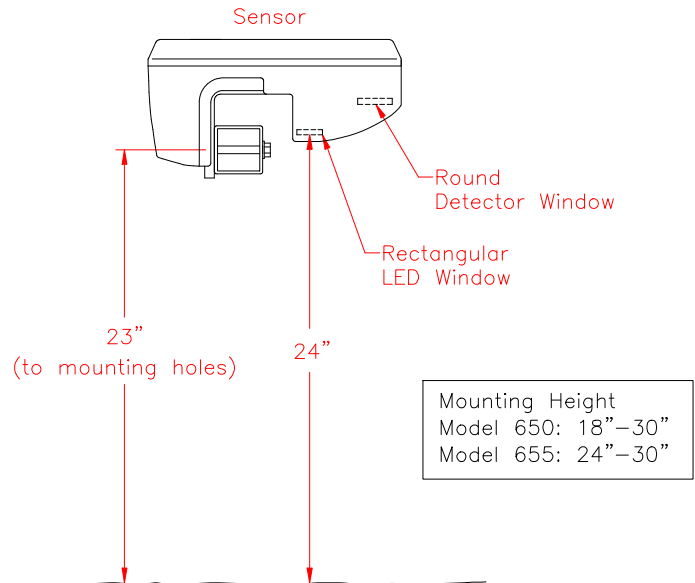
Appendix B: Boom Configurations

Boom Setup

The WeedSeeker® Automatic Spot Spray System is used in orchards, vineyards, row crop fields, fallow fields, irrigation and street and roadside applications. Applications require many different mounting arrangements for the Sensors. The type of mounting bar depends on the type of vehicle and how it will be attached.

The Model 650 Sensor must be *between 18 and 30 inches from the ground* for the units to “sense” properly. To accommodate maximum ground variations, the height of the rectangular LED window should be in the middle of this range, or about 24 inches.

The Model 655 Sensor height must be *between 24 and 30 inches from the ground*, with the optimal height of the rectangular LED window at about 27 inches.



Boom Styles

A typical application is fallow field spraying using a straight boom as shown in Fig. 3b. In this case, the sensors are evenly spaced, and oriented vertically on a boom equal to the width of the spray pattern.

When the width to be treated is wider than the boom (as in the back of a vehicle), the end sensors are lowered and angled out to extend the total Field of View (Fig 3a). This can be accomplished either by using a bar that steps down, as shown in Fig. 2a, or by using a straight bar at a lower level and stepping the Sensors up with the use of mounting plates as shown in Fig. 2c. (The mounting plates are not included with standard kits.)

Figs. 2a through 2d show four frequently used orchard and vineyard boom configurations. Figs. 3a and 3b show two flat surface boom configurations.

For Row Crop applications, standard WeedSeeker® Systems are available in 4, 6, 8, 10 & 12 row configurations, with row spacing from 12 – 40 inches. Custom configurations are available. The Sensors are placed under plastic hoods to keep non-selective chemicals from drifting onto the crop (Fig. 4). The hoods, tank, pump, and hoses are mounted on a tool bar that attaches to a tractor.

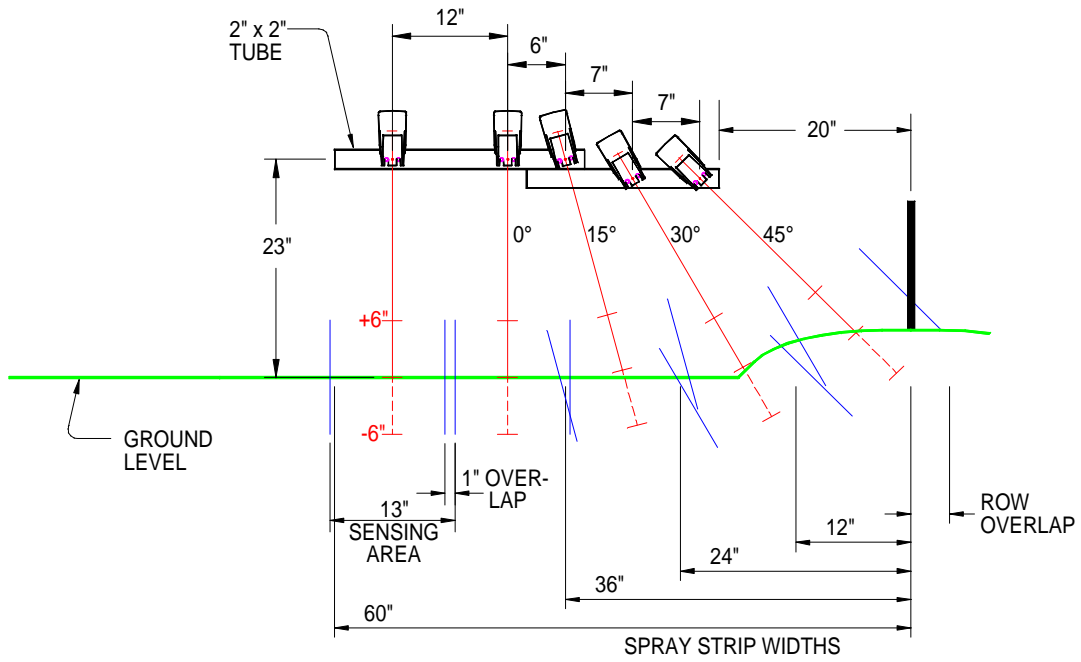


Fig 2a. Boom for Sensors with strip coverage with berm, 2" x 2" square tube

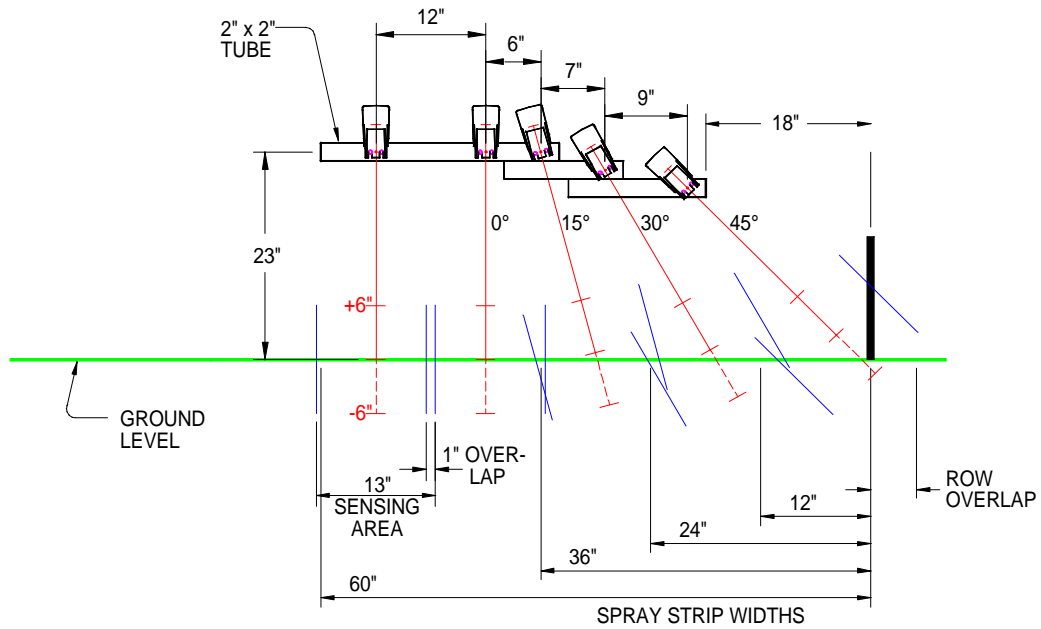


Figure 2b. Boom Configurations, 2" x 2" square tube

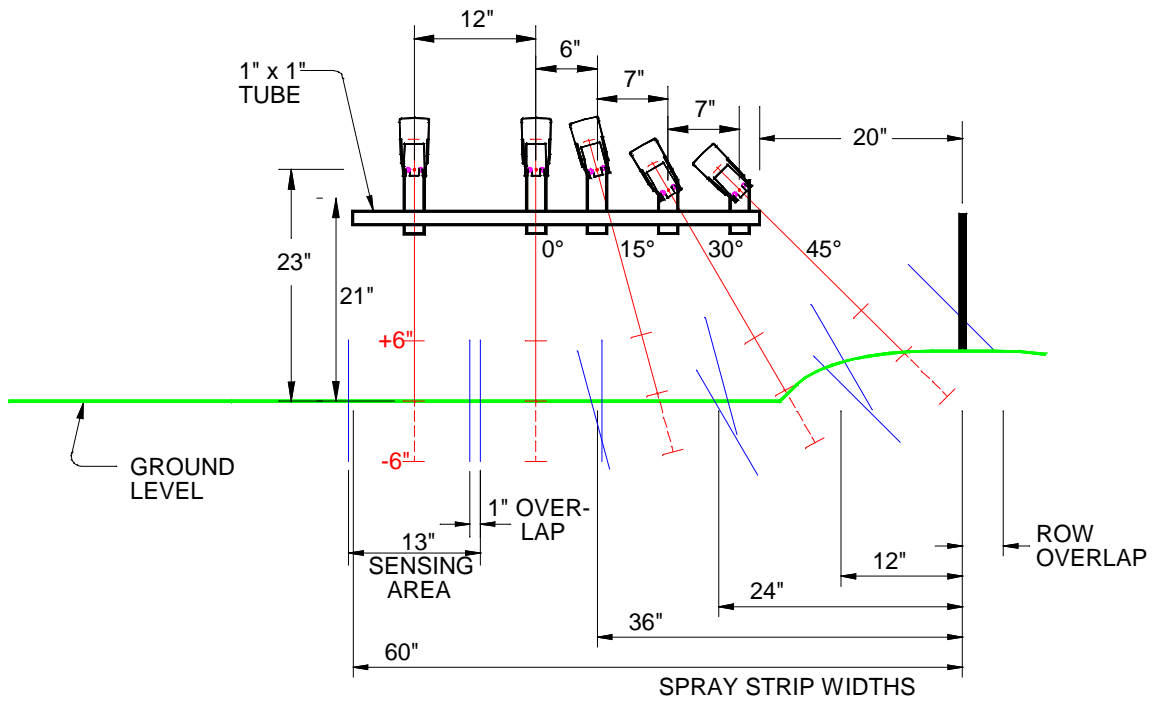


Figure 2c. Boom Configurations, 1" square tube with mounting plates

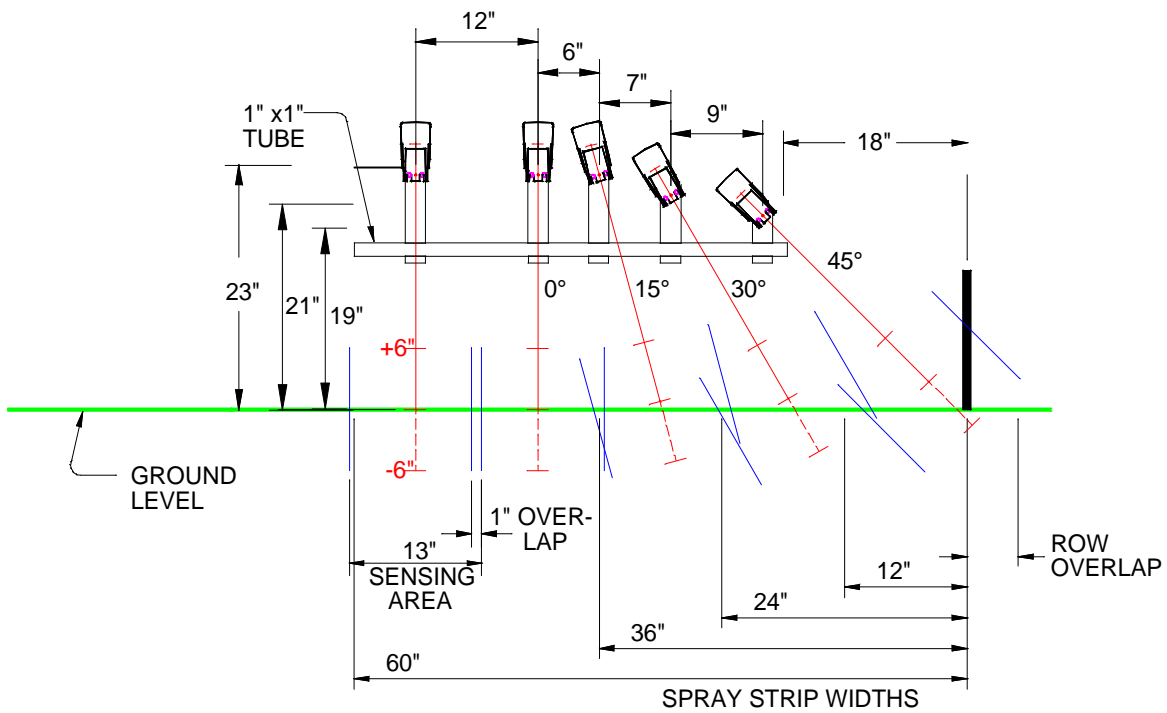


Figure 2d. Boom Configurations, 1" square tube with mounting plates

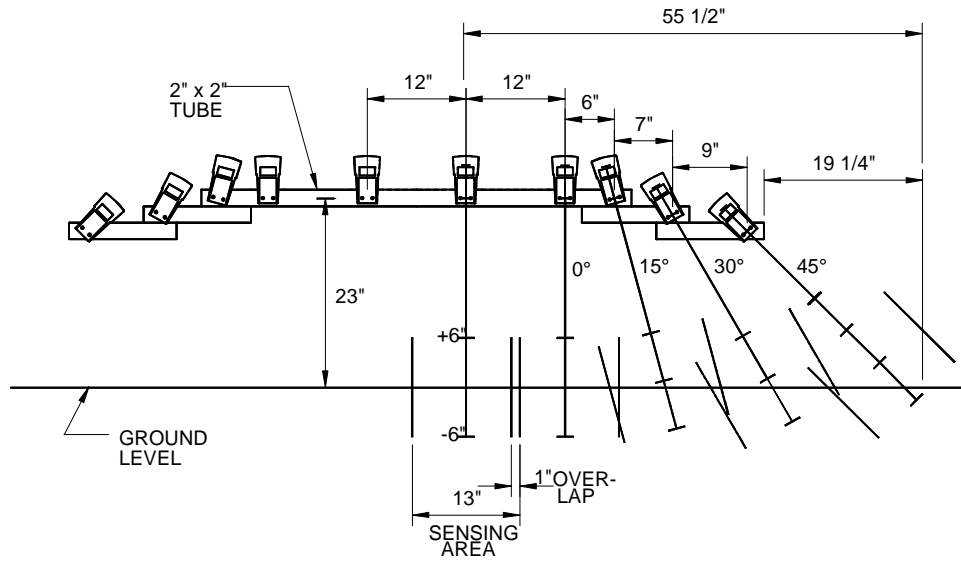


Figure 3a. Boom for Sensors for complete coverage, (10 sensors shown as an example)

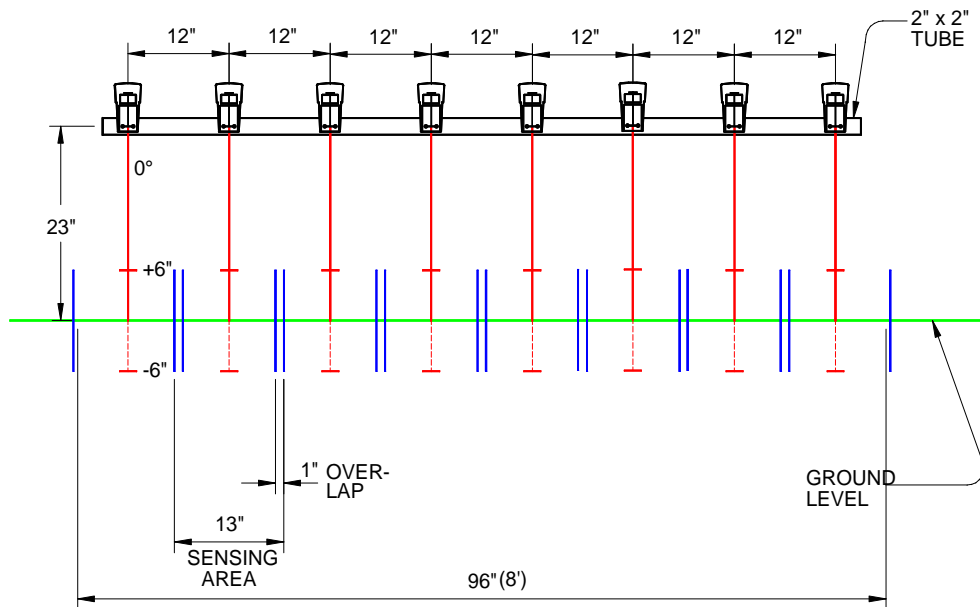


Figure 3b. Boom for Sensors for complete coverage, (8 sensors shown as an example)



Figure 4. *6-Row, 40" System. The hoods, tank, pump, and hoses are mounted on a tool bar.*

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8. MISCELLANEOUS

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General Terms And Conditions Covering Sales

All sales of merchandise by NTech Industries, Inc. are subject to the General Terms and Conditions as provided herein and on invoices issued by NTech Industries, Inc.

PRICES: All goods and products sold by NTech Industries, Inc. will be billed to its customers according to the price lists contained in the current bulletins and price lists issued by NTech Industries, Inc. All prices are subject to change without notice and supersede all prior price lists. NTech Industries, Inc. assumes no obligation to sell to anyone at any price or at any of the terms listed herein.

TERMS: Customer orders will be accepted subject to credit investigation, and approval, and delivery may be withheld on accepted orders, other than cash in advance, without any liability on the part of NTech Industries, Inc. if, in its opinion, there is doubt concerning the ability of the customer to pay for merchandise ordered under the terms and conditions contained in current bulletins and price lists issued by NTech Industries, Inc. After delivery of merchandise, should NTech Industries, Inc., at its sole discretion, institute legal action for collection, customer agrees to pay all attorney fees and costs incurred by NTech Industries, Inc. by reason of such action.

FREIGHT AND DELIVERY: PRICES ARE F.O.B. FACTORY: Delivery to the initial carrier shall constitute delivery to the customer. NTech Industries, Inc.'s responsibility ceases upon delivery in good order to the carrier and all goods are shipped at the customer's risk. Customer shall be responsible for filing a claim with carrier. NTech Industries, Inc. shall not be liable for any delay or failure in the delivery or shipment of merchandise against an accepted order or for any damages suffered by reason thereof when such a delay or failure is, directly or indirectly, due to accident (in manufacture or otherwise) fire, flood, riot, war, embargo, labor stoppage, delays in transportation, inadequate transportation, shortage of materials or supplies, regulation by Government authority or any like or dissimilar cause or causes beyond the control of NTech Industries, Inc. Shipping weights and freight estimates given are approximate, for customer's convenience only, and are not guaranteed.

SHORTAGES OR VARIANCES: No claims for variances from or shortages in orders will be honored unless presented within fifteen (15) days after customer's receipt of order.

CANCELLATION OF ORDERS: After a purchase order has been provided by customer, written or oral, an order may be modified canceled only upon written confirmation by NTech Industries, Inc. Additional costs incurred by NTech Industries, Inc. as the result of modification or cancellation will be billed to customer. Orders for merchandise requiring special manufacturing or supervision, or articles of a special nature, will not be canceled after production is commenced.

TAXES: Taxes, whether local, state or U.S. government now in effect, or hereafter levied, upon the product, sale thereof, use, shipment, or otherwise, of goods ordered or sold shall be charged to and paid by customer.

CHANGES IN DESIGN: Factors beyond the control of NTech Industries, Inc., the need for continuing improvement of product for competitive reasons, or for any other reason, may require changes from time to time in products and their packaging. NTech Industries, Inc. reserves the right to make such changes of any kind, at any time, without notice. NTech Industries, Inc. may also, from time to time discontinue the sale of its products, without notice.

LIMITED WARRANTY: NTech Industries, Inc. warrants its products to be free from significant defects in material and workmanship under normal use and service for a period of one (1) year from the date of RETAIL SALE ESTABLISHED BY THE USE OF NTech Industries, Inc.'s WARRANTY REGISTRATION FORM. THE OBLIGATIONS OF NTECH INDUSTRIES, INC. UNDER THIS WARRANTY are limited to the repair or replacement, at NTech Industries, Inc.'s option, of defective parts of the product which shall, within one (1) year from the date of purchase, be returned with proof of purchase to NTech Industries, Inc.'s facility, Ukiah, CA., TRANSPORTATION CHARGES PREPAID. When it is impractical to return the defective parts of such products to NTech Industries, Inc.'s factory, then NTech Industries, Inc. shall be liable solely for supplying the material necessary to replace or repair the defective parts. WHILE NTECH INDUSTRIES, INC. WILL NOT CHARGE FOR LABOR IN CONNECTION WITH WARRANTY REPAIRS OR REPLACEMENTS MADE AT ITS FACTORY, NTECH INDUSTRIES, INC. AT ITS SOLE DISCRETION MAY CHARGE FOR LABOR AND EXPENSE INCURRED BY IT IN CONNECTION WITH WARRANTY REPAIRS MADE AT THE CUSTOMER'S LOCATION. In any event, NTech Industries, Inc. reserves the right to determine whether or not a defect exists for which it is responsible under this warranty. A RETURN MATERIAL AUTHORIZATION NUMBER (RMA) must be obtained from NTech Industries, Inc. prior to the return of any merchandise. This warranty is void if the product has been damaged by customer prior to acceptance or as a result of unreasonable use, neglect, alteration, improper service or other causes not arising out of defects in material or workmanship or if any serial number on the product has been altered or defaced.

NTECH INDUSTRIES, INC. SHALL NOT BE RESPONSIBLE FOR LOSS OF USE OF PRODUCT OR OTHER INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES INCURRED BY PURCHASER INCLUDING BUT NOT LIMITED TO PERSONAL INJURY AND PROPERTY DAMAGE.

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CONTRACT WITH CUSTOMER: No terms and conditions of a customer's order at variance with NTech Industries, Inc.'s General Terms and Conditions and/or its invoice shall be binding upon NTech Industries, Inc. unless specifically agreed to by NTech Industries, Inc. in writing. In acknowledging any order, any and all terms and/or conditions of customer's order or correspondence contrary to those of NTech Industries, Inc. are to be deemed waived by customer.

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Safety Precautions



RULES FOR SAFE USE OF CHEMICALS

- Always read the label before using chemicals. Follow instructions from chemical manufacturer on how to select, use and handle each chemical. Note protection information each time before opening the container.
- Verbal warnings must be given if written warnings cannot be understood by workers.
- Do not spill chemicals on skin or clothing. If chemicals are spilled, remove contaminated clothing immediately and wash skin and clothing thoroughly with soap and water. Wash hands and face with soap and water and change clothing after spraying. Wash clothing each day before reuse.
- The spray tank and system should be emptied of chemical mixture and flushed with clean water before servicing the spray system or spraying components. Clean the GreenSeeker System of all chemical residue before servicing.
- Avoid inhaling chemicals. When directed on the label, wear protective clothing, face shield or goggles.
- Never smoke while spraying or handling chemicals.
- Cover food and water containers when spraying around livestock or pet areas.
- If symptoms of illness occur during or shortly after spraying, call a physician or go to a hospital immediately.
- Follow label directions and advice to keep residues on edible portions of plants within the limits permitted by law.
- Keep chemicals out of reach of children, pets and unauthorized personnel. Store them outside of the home, away from food and feed and lock them in a secure area.
- Keep bystanders away from spray drift.
- Always store chemicals in original containers and keep them tightly closed. Never keep them in anything but the original container. Read labels for hazards about chemical reaction with certain types of metals.
- Always dispose of empty containers according to manufacturers' directions.



OPERATOR SAFETY WARNINGS

- Never use the WeedSeeker® System without instructions. See Owner and Operations Manual.
- Always read chemical manufacturer instructions before handling or spraying chemicals.
- Always install boom stop before working under or around raised spray booms.
- Clear spray boom area before extending and folding the booms.
- Keep bystanders away from the WeedSeeker System when operating.
- Drive slowly over rough terrain or when turning.
- Avoid driving up and down steep ditches and hills.
- Always install boom tie-down chains before transporting or towing the WeedSeeker System on sprayer.