



WEEDSEEKER OPERATION GUIDE

AUSTRALIAN BUILT FOR TOUGH AUSTRALIAN CONDITIONS

GENERAL INFORMATION

- LED lights indicate when the sensor is firing (spraying).
- Jockey wheel pressure is 20 psi
- Operating height is 65 to 75 cm above the ground, at 70cm it gives the sensor a 60cm field of view, this is the same width as the nozzle sprays.
- Don't leave folded up, 1 day in the sun will damage the sensors
- Maximum operating speed is 16 to 17 KPH
- Do not exceed 3 bar operating pressure on the Weedseeker spray line (the goyen solenoids are direct acting plunger type)
- Every 3 to 4 hours check sensors & solenoids by passing a green leaf under the sensors
- Changing light conditions will require regular recalibration.
- When working in variable soil types, calibrate over the lightest coloured soil.
- Voltage is most important, any change in voltage will effect the sensitivity of the sensors
- The recommended sensitivity setting is 4 to 5 in stubble conditions, a lower setting will cause misfires.

WIRING INFORMATION

100 amp blade fuse	Located at the tractor battery on 2 pin grey lead for trickle charge
100 amp mega fuse	From battery to isolation switch
40 amp midi fuse	To power goyen solenoids, 1 for each section 1,2 & 3.
15 amp blade fuse	To power line controllers 1,2 & 3.

The largest wiring harness is 1 long continuous cable to give power to the sensors, when they see green the valve driver acts as a switch and sends power to the goyen solenoids & LED lights .

The main harness is wired like Christmas tree lights.

Line controllers:

- The left hand 2 pin plug is to power up the line controller, direct from the weed-seeker battery.
- The right hand side 21 pin deutsch plug is from the in cab control box.
- The middle 2 plugs are the daisy cables linking each sensor.



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If a sensor fails, complete the following checks.

1. Restart by shutting down the power switch in the console (each sensor has a computer circuit board, these will get glitches in them like any computer). If this fails.
2. Shut down all the power to the Weedseeker by turning off the master switch at the battery for 5 minutes, then restart.
3. **VOLTAGE** - Check you have at least 12.2 volts in the power cable at the line controller (12.1 volts or below will not work).
4. Check fuses in the battery box.
5. Check the voltage at the battery.
6. Check the voltage in the main harness at each end
7. Check the voltage in the main harness at each end, with the console in the flush position. (**minimum is 11 volts**)

If a bank of sensors stop working, we need to find out which sensor or valve driver or daisy cable has failed, or if the line controller itself has failed.

First disconnect the daisy cable from one side of the line controller to see if the sensors on the other side of the line controller turn on. If they don't turn on replace this cable and remove the daisy cable from the opposite side of the line controller to see if the sensors on the other side of the line controller turn on.

When you have found which side won't turn on, disconnect the daisy cable half way along from the line controller & see if the sensors prior to this one turn on.

If they don't turn on replace the daisy cable and remove the next daisy cable closer to the line controller, keep testing toward the line controller until you find the faulty sensor.

If the sensors turn on, this sensor is the fault, or the fault is further away from the line controller, keep testing toward the end of the section, away from the line controller until you find the faulty sensor.

When you find the faulty sensor we need to find out if it is the valve driver, the daisy cable or the sensor itself.

1. Swap the Daisy cable with a new one or one you know does work, to see if this fixes the problem.
2. Swap the valve driver with one you know does work, to see if the problem moves.
3. Swap the sensor with one you know works, to see if the problem moves.
4. If the line controller fails, swap it with one you know does work, to see if the problem moves.

WeedSeeker® Quick Reference Guide

Selective Spot Spray System

System Startup

1. Verify that the **FLUSH** switch is OFF.
2. Turn the **POWER** switch ON. The WARM UP indicator will flash for approximately 20 – 30 seconds while the electronics reach the proper operating point.
3. During the warm up phase, make initial adjustments to the system for **SENSITIVITY** and **SPEED**. Use 3 to 4 as a good starting point for Sensitivity, and then adjust as necessary in the paddock. **NOTE: If the SENSITIVITY setting is set too high (setting 10), the sensor will miss small weeds. If it is set too low (setting 1) it will be too sensitive, and will tend to false fire.**
4. Set **SPEED** to “LO” for 5–10kph, “MED” for 10–15kph, and “HI” for 15–20kph. If the vehicle speed is unknown, set **SPEED** to “MED” 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 the weed, increase the **SPEED** setting.
5. When the **WARM UP** light goes off the Sensors will be in **STANDBY** mode. The Sensors should be calibrated for the specific soil or pavement type in which the system is to be working. Calibrate the Sensors by positioning the sensors over a weed free patch of ground. To calibrate the sensors press the **SOIL BASE** switch up for a couple of seconds. For best results, set the **SOIL BASE** within the paddock which you are spraying. **NOTE: In variable soil types calibrate the Sensors over the lighter coloured soil or background.**
6. 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).
7. Turn on the pump and set the desired pressure to **300 kPa (45 psi maximum)**.
8. 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 recognising the weed, check the Sensitivity setting. If the problem persists, refer to the WeedSeeker® Troubleshooting Manual.



You are now ready to begin spraying



Tips for getting the best out of your WeedSeeker® System

Initial Startup

1. **Start the tractor or sprayrig prior to turning on the WeedSeeker® system.** Before you fill up with chemical and drive to the paddock turn on the WeedSeeker® system. This will give the circuitry in the Sensors time to warm up to operating temperature, saving you having to calibrate the Sensors as often when you first start operating.
2. **It is also good practice to check the lenses of the Sensors for dust or dirt** every time you fill the spray tank. This usually only takes a couple of minutes to wipe clean with a soft clean cloth.

Calibrating the System

Calibration of the Sensors is one of the most important parts to operating the system to its full potential.

You **can not** over calibrate the system. If the Sensors seem to be false firing to much, it is far better to re-calibrate the system first before changing the sensitivity to a higher setting. **NOTE:** *Take a little time to get the calibration figure right and you find you will acheive better results.*

1. **Make sure the Sensors are positioned over a weed free zone in the paddock.**(Not over the road or track at the end of the paddock). Each Sensor stores its own calibration figure, if there is a weed present under one of the Sensors, that Sensor will not target any weed of the same size or smaller than the weed the Sensor was calibrated over.
2. **The boom has to be within the correct working height (between 600-750mm from the ground).** If working in tall stubble make sure to run the boom above the stubble. **NOTE:** *Running the boom in the stubble could cause damage to cables and Sensors.*
3. **If working in variable soil types** it is best to calibrate the Sensors over the lightest coloured soil in the paddock. If the Sensors are calibrated over the darkest soil, when you travel over lighter soil the reflectance value is too high for the Sensors and they may miss small weeds. Where as calibrating over lighter coloured soil, the Sensors become more sensitive when over the darker soil type.
4. **Calibrating over a even background** can acheive the best results. Calibrating along a header trail so every sensor has a similar light coloured background can help. When you do this you may find that the sensors will false fire a little at bare spots through the paddock, but you will also see that the system will be targeting smaller weeds.

Setting the Sensitivity

1. **A normal sensitivity range for the system is between 2 – 5.** **NOTE:** *Remember 1 is the most sensitive 10 is the least sensitive.* When starting in a paddock, always start on a lower setting until you are comfortable with what the Sensors are targeting. **NOTE:** *To spray a bit to much for the first couple of runs is better than missing weeds.*
2. **To target the smallest weeds possible,** you will have to have the system false firing a little. If no Sensors are firing until a weed is present usually means the system is not sensitive enough.

NOTE: *A few Sensors false firing usually doesn't equate to much wasted chemical*

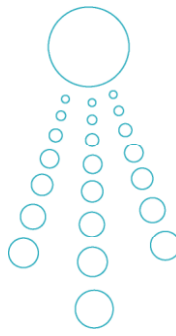


WeedSeeker Rates (L/Ha) using TP65 even nozzles

Sprayed Width (cm) 60 Testing has shown that the effective spray coverage of a single nozzle is 60cm.

Nozzle Size	Pressure (Bar)	Droplet Size	Flowrate (L/min/nozzle)	Speed (Km/H)				
				12	14	16	18	20
03	2	C	0.96	80	69	60	53	48
	2.5	C	1.08	90	77	68	60	54
	3	C	1.18	98	84	74	66	59
	4	M	1.36	113	97	85	76	68
04	2	C	1.29	108	92	81	72	65
	2.5	C	1.44	120	103	90	80	72
	3	C	1.58	132	113	99	88	79
	4	M	1.82	152	130	114	101	91
05	2	C	1.61	134	115	101	89	81
	2.5	C	1.8	150	129	113	100	90
	3	C	1.97	164	141	123	109	99
	4	C	2.27	189	162	142	126	114

Caution: *Increasing spray pressure above 3 Bar will reduce WeedSeeker accuracy and increase the chance of creating driftable fines.*



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Kev's Tech Tips

Getting the most out of your WeedSeeker

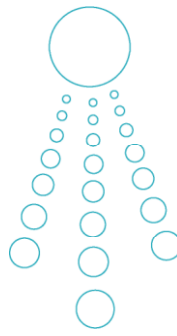
Calibration – it is important to calibrate your WeedSeeker correctly prior to use.

When you press and release the calibrate switch you are setting the background chlorophyll level for each individual sensor. This is instantaneous and there is no need to hold the switch. The sensor will only trigger the solenoid if the chlorophyll level is greater than that set at calibration. It is therefore important to make sure there are no weeds under the boom. If there is a weed present under a sensor when you calibrate the system, it will cause that sensor to detect only weeds bigger than the one calibrated over. It may be necessary to manually remove weeds from under the boom prior to calibrating.

It is also essential to calibrate the system over the same background that is in the paddock. If the paddock is bare soil, simply calibrate over that soil. If the paddock has stubble, the system should be calibrated over the stubble, not over a roadway or bare area. The ideal area would be in a headland with the boom placed over any header trail. Calibrate the system over the lightest soil background in the paddock, i.e. if you have both sandy and black soil, calibrate over the sandy soil. This will ensure your WeedSeeker operates at its most efficient over the entire paddock.

There is no difference in the calibration technique for day or night use.





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Kev's Tech Tips

The importance of maintaining your batteries and alternator

It cannot be emphasised enough how important it is to maintain your batteries and alternators to keep them in peak condition.

The most common problems that arise with WeedSeeker can be traced to a weak set of batteries or a faulty or unsuitable vehicle charging system.

The electronic circuitry contained within your WeedSeeker system relies on a minimum operating voltage of 10.8V, but please remember that this voltage is required at the Line Controller terminals of your system.

On your average 24 metre system this means that a battery voltage of at least 12.0V is required for smooth operation.

On a 36 metre, or larger, system battery voltages need to be upwards of 12.5V.

Most modern tractors and sprayers have a large amount of electronics installed and the manufacturer usually supplies an alternator that will easily cope with this.

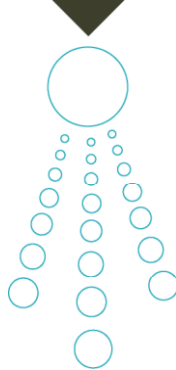
However, as tractors and self-propelled sprayers age their batteries deteriorate meaning that their current supplying ability diminishes. This is made even more apparent if the equipment is left unused for extended periods or the batteries become flat.

As a guide, if your tractor requires jump starting it will not have enough power to run the WeedSeeker system reliably until the batteries are fully charged once more. This may mean several hours of engine operation prior to turning on your WeedSeeker. Alternatively an overnight charge via a good quality battery charger should be sufficient.

The symptoms of battery or charging system faults are easy to spot. Your WeedSeeker system requires more power the more solenoids that fire at once. Therefore when the system is in flush mode, all solenoids firing, it is most susceptible. A typical problem will be shown by the LED's of one section turning off and on when the "Flush" switch is activated. The Master Controller in the cab may also switch itself off and back on in a cycling motion.

If this occurs please ensure that the engine is running.





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Kev's Tech Tips

Getting the most out of your WeedSeeker

Spray Pressure

Your WeedSeeker system should be operated with a constant spray pressure. Please ensure you operate your controller in manual mode and not at an automatic litres per hectare rate.

It is essential that you operate your WeedSeeker with a spray pressure of between 2.5 and 3bar. This is important due to the operational limitations of the goyen solenoid. If the spray pressure rises above 3bar, the speed of operation of the solenoid may slow. This may cause your WeedSeeker to miss the target weeds.

As a reminder, operating the WeedSeeker at 3bar at 16km/hr with the standard 6503E nozzle, will deliver a water rate of 100L/hectare. If you require a higher water rate, this can be achieved by increasing your orifice size or reducing your speed, not increasing your spray pressure.

If maintaining a constant spray pressure is a problem, this is more apparent with diaphragm pumps. There are solutions available. For example, a Ramsay Valve and/or installing a better quality pressure relief valve system.

Operating Speed

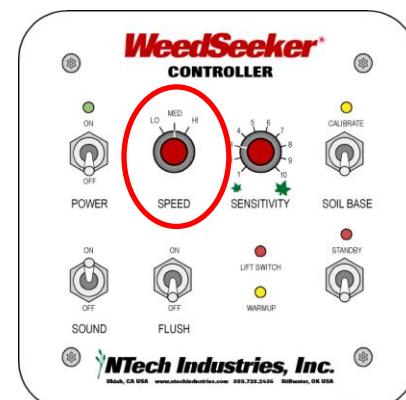
For agricultural applications, we recommend that your WeedSeeker system be operated at a speed of between 16-18km/hr. Although faster operation is possible, this has proven to be the ideal speed. Please remember that when you increase your speed two issues may arise:

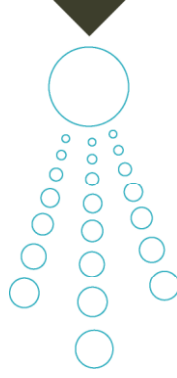
1. The WeedSeeker will become less sensitive and may miss smaller weeds.
2. The timing of the solenoid firing may mean the chemical misses the target weed.

In a standard installation, there are 3 speed settings on your Controller:

1. 'LO' = 5-10km/hr
2. 'MED' = 10-15km/hr
3. 'HI' = 15-20km/hr

Therefore, at our recommended speed of 16-18km/hr your WeedSeeker system speed should be set to 'HI'.





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Kev's Tech Tips

Routine Maintenance of your WeedSeeker System

Compared to most equipment on the farm the WeedSeeker is a very low maintenance system, however it is important to follow a few basic steps to make sure it is working at its best.

Please note that these steps are additional to any required for a normal broadcast spraying operation.

Before every use the operator should conduct a visual inspection of all sensors, solenoids and wiring.

(A good time to do this is while filling the chemical tank)

- 1) Visually inspect the cables and wiring for damage and replace as necessary. Replace any broken or missing cable ties and ensure cables are secured to the boom. This prevents any possible damage from contact with stubble.
- 2) Visually inspect the sensors for physical damage and ensure the light and detection windows are clear and clean. If a damaged sensor is located please replace it with one of your spare sensors immediately and return it to your dealer for repair. If a damaged sensor is removed immediately it may only require a new casing. If it is left on the boom and chemical or water finds its way into the electronics the repair is more complex. If the light or detection windows are dirty please clean with a soft clean cloth being careful that any grit will not scratch the lense surface.
- 3) Once within the area to be sprayed "Flush" the WeedSeeker and ensure chemical is flowing through all solenoids.

After each use the operator should clean the system ready for next use.

- 1) All chemical lines and solenoids should be flushed with clean water.
- 2) Check the cables and wiring for damage and replace as necessary. Check cable ties.
- 3) Check the cables and sensors for physical damage and replace as necessary.
- 4) If dirty, the boom and sensors can be cleaned by using a garden hose or other low pressure water source. Please ensure water is not directed upwards towards the cable entry points.

Other Precautions

For booms where the sensors face upwards in the folded position, please ensure the sensors are covered, this is to prevent optics damage by direct sunlight entering the light source and detection windows, as well as possible damage from water pooling in the lense housings.

Although the WeedSeeker is designed for outside storage we recommend that you store it undercover for maximum service life.