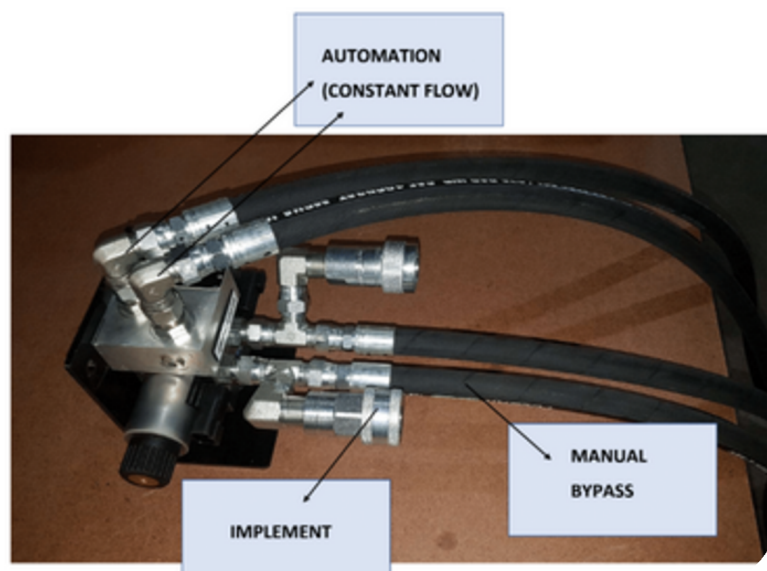# ◿ DITCH ASSIST

1. INITIAL SETUP

Follow these steps to install your Ditch Assist hardware!

1

Install Control Module on implement using magnet mounts, ensuring line of sight to cab

2

Assemble and connect hydraulic fittings and hoses as shown in included guide

3

Mount Proportional Valve near implement hitch or on rear of tractor using included mount bracket

4

Mount GPS antenna on implement with clear sky view. GPS must raise/lower with cutting edge

5

Connect power harness to tractor battery. Connect remaining cables to GPS, Valve, and Control Module

It's essential that the Control Module has an unobstructed view to the cab, that the GPS has unobstructed sky view at all angles, and that power comes from the tractor battery and not a power strip or trailer plug

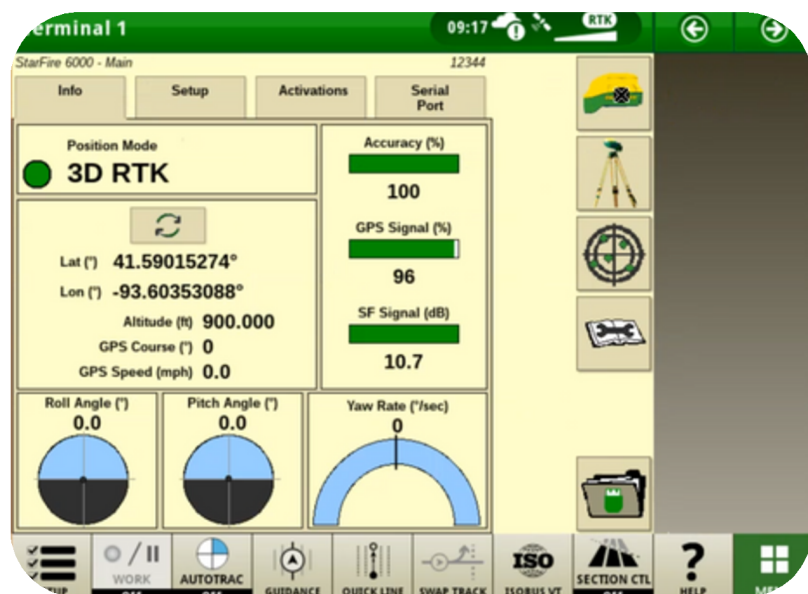# DITCH ASSIST

2. GPS SETUP

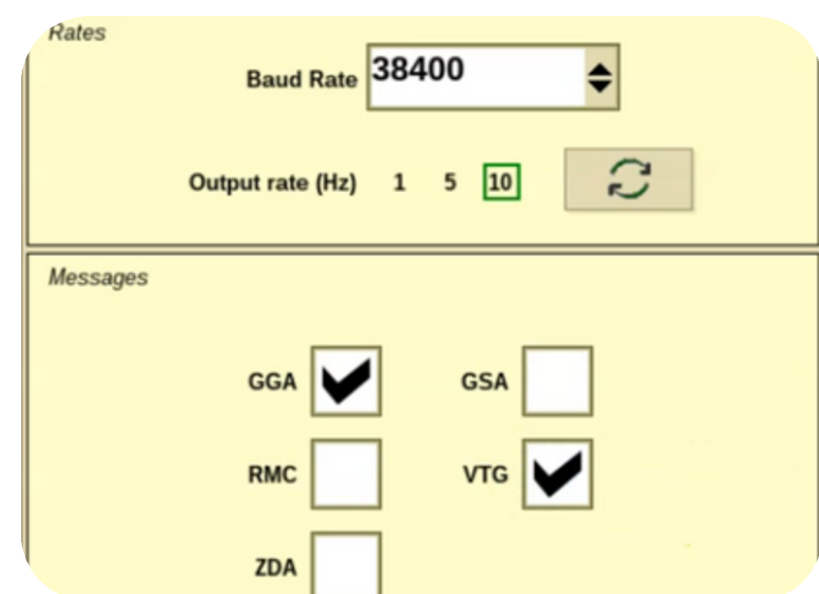## Follow these steps to setup your RTK GPS for Ditch Assist!
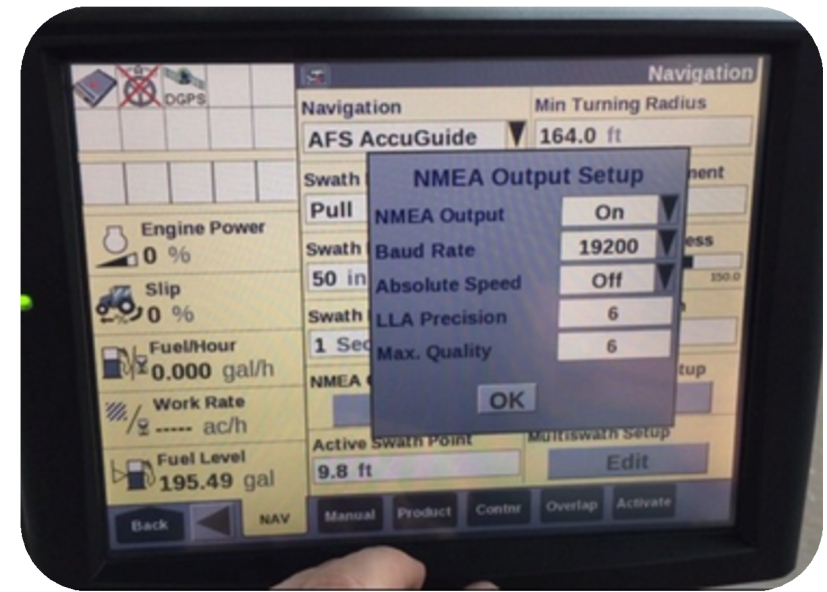
1 Navigate to GPS settings (usually via tractor monitor) or use Flow app for Emlid receivers

2 Locate Position Output/NMEA Output/ Serial Output or similar settings
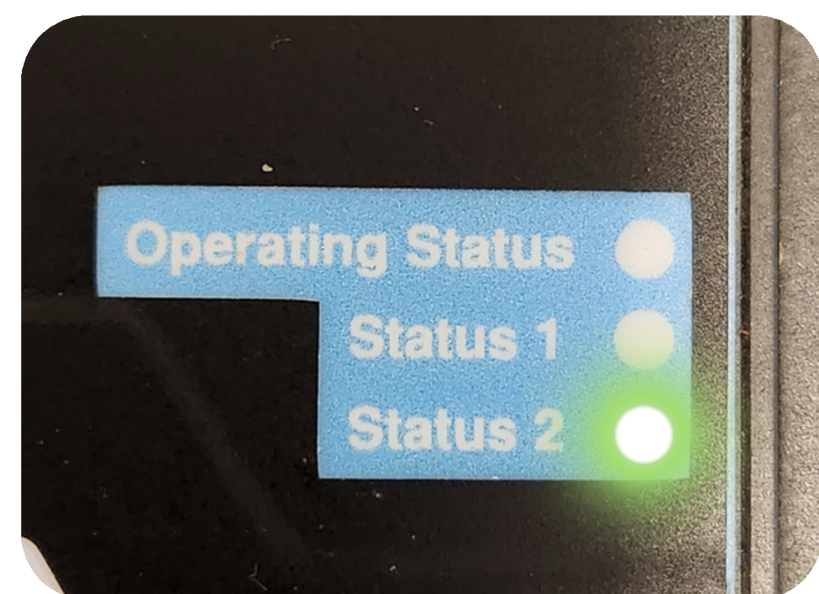
3 Set *Baud Rate* to **38,400**, enable **GGA** and **VTG** messages at 5Hz or 10Hz. *Turn OFF all others*

4 Connect GPS to Ditch Assist and power on. Ensure GPS is outside and has clear sky view for messages to send

5 On the Ditch Assist Control Module, the **Status 2** light will blink if NMEA messages are received

(If Status 1 light is blinking your GPS may be communicating via CAN - e.g. some Outback and Trimble receivers)
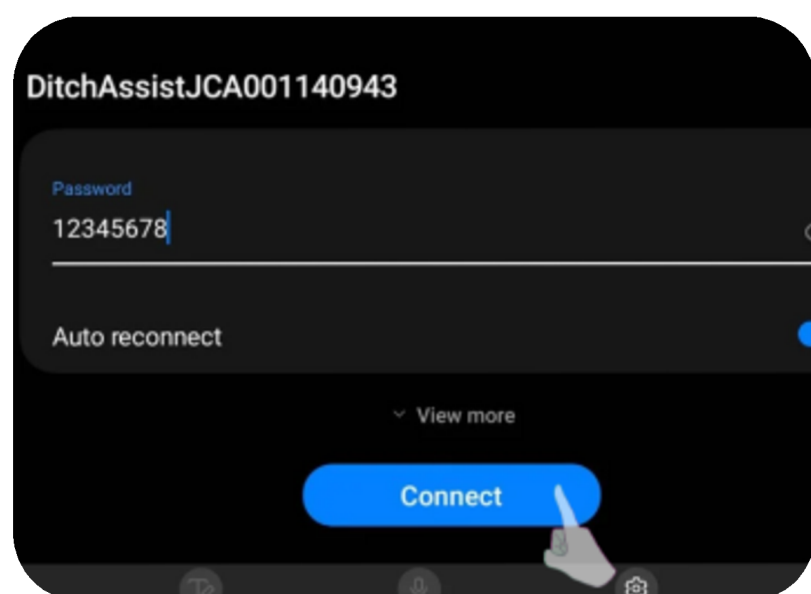
⟁ DITCH ASSIST

3. INITIAL TESTING

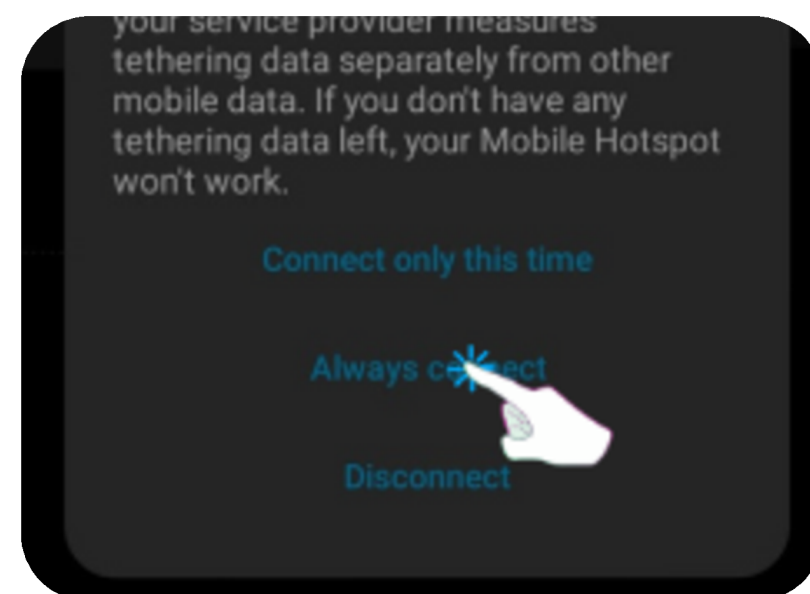## Follow these steps to ensure your Ditch Assist is working!

1

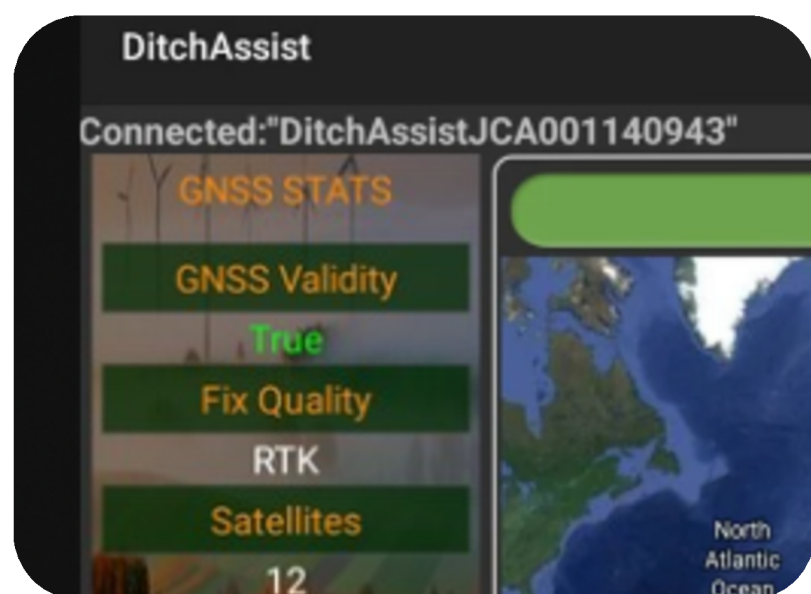**Scan the QR code with your Android Tablet to download the Ditch Assist app**

2

DitchAssistJCA001140943

Password
12345678

Auto reconnect

⌄ View more

Connect

Connect the tablet to Ditch Assist Wi-Fi using the Android settings. The password is *12345678*

3

your service provider measures tethering data separately from other mobile data. If you don't have any tethering data left, your Mobile Hotspot won't work.

Connect only this time

Always connect

Disconnect

Wait for a message that the connection has no Internet access. Click *Always Connect* to approve

4

DitchAssist
Connected:"DitchAssistJCA001140943"

GNSS STATS

GNSS Validity
True
Fix Quality
RTK
Satellites
12

North Atlantic Ocean

In the app, click *Connect WiFi*. Verify Control Module info and GPS position are shown

5

RAISE   LOWER

Enable constant flow to the valve. Use the Implement *Raise* and *Lower* buttons to test hydraulic control

If the implement goes up when you press and hold the *Manual Lower* button, reverse the cable connections on the valve. If nothing happens check hydraulics and settings, try increasing and reversing flow, and verify the valve solenoids are being energized.

DITCH ASSIST

4. APP SETUP

Follow these steps to setup the app for your configuration!
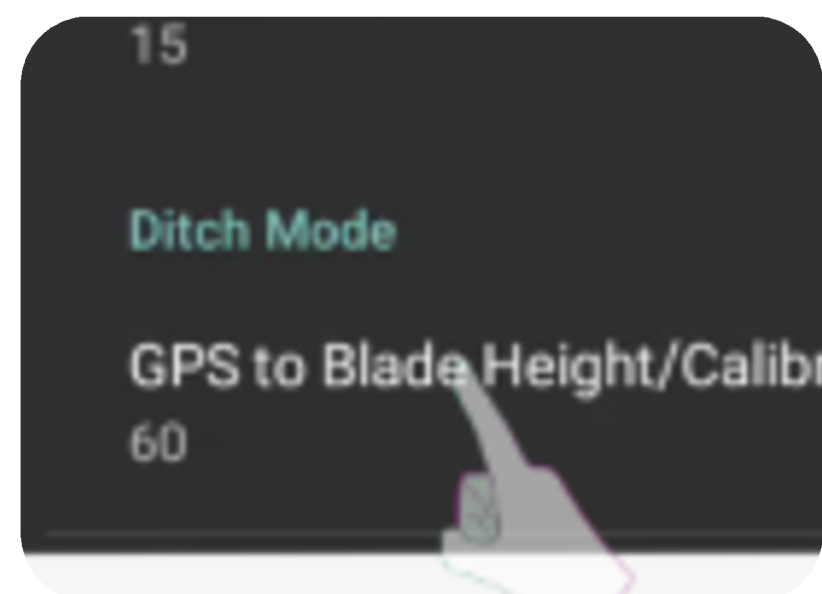
1
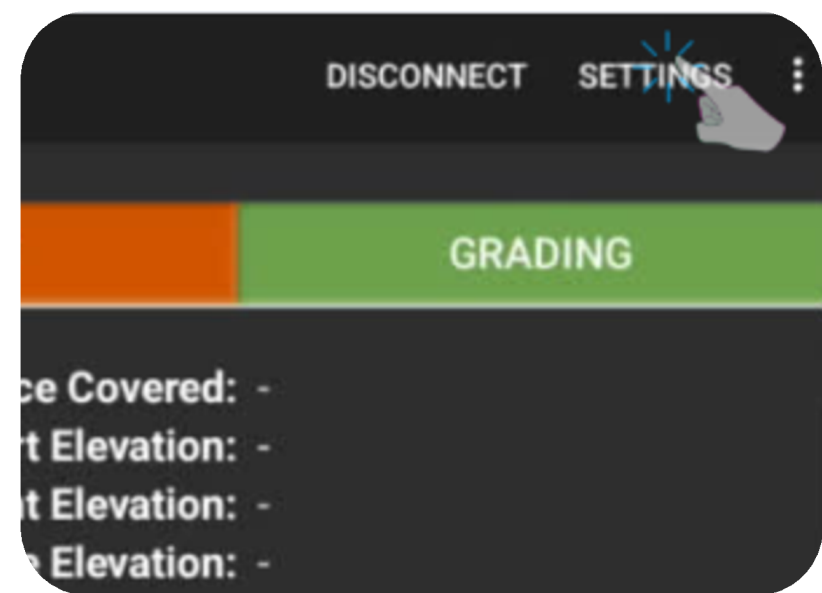
Open the *Settings* menu from the top right of the Ditch Assist app screen. Set units to metric if needed

2

With implement raised in transport/survey position, measure blade to ground height and enter here
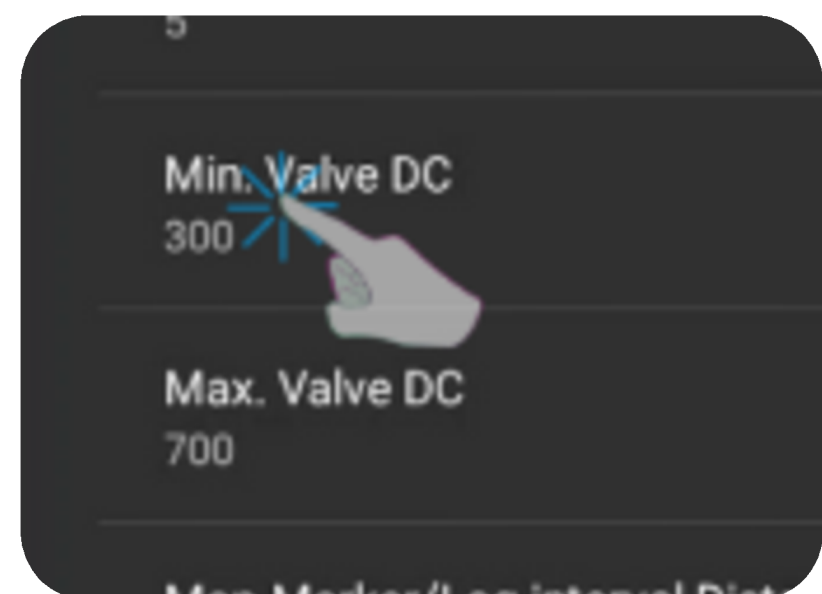
3

Measure *GPS to Blade* height and enter here. (Note this is NOT GPS to ground height)

4

Increase/decrease response sensitivity when pressing manual Raise / Lower buttons here

5

Adjust valve PWM responsiveness for Min. and Max valve DC here. Values between 0 and 1000

For larger implements with higher flow requirements you may need to increase the Min. and Max. DC values for faster response movement. Smaller implements may require lower settings to prevent jerky movement and overshooting the target. Make small incremental adjustments and test.

DITCH ASSIST

5. RUN A SURVEY

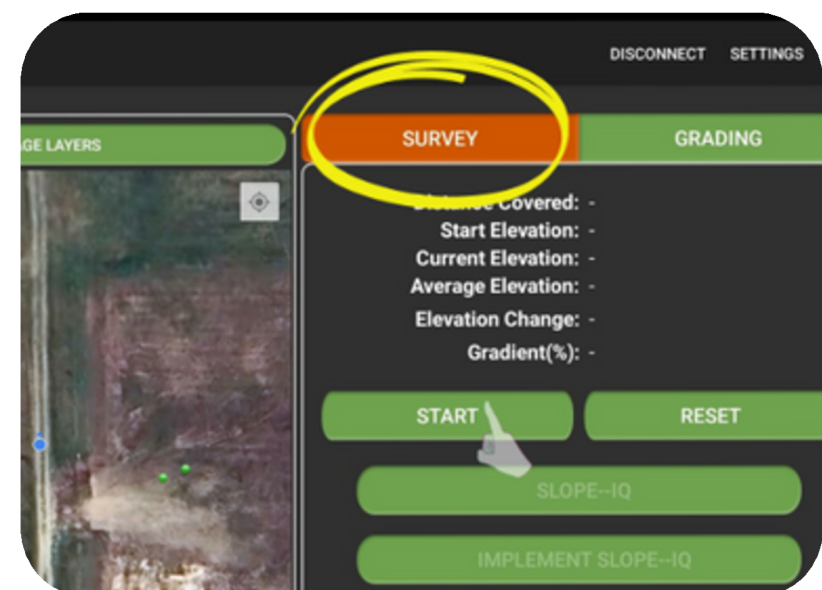## Follow these steps to pre-survey a run for a surface drain!

1
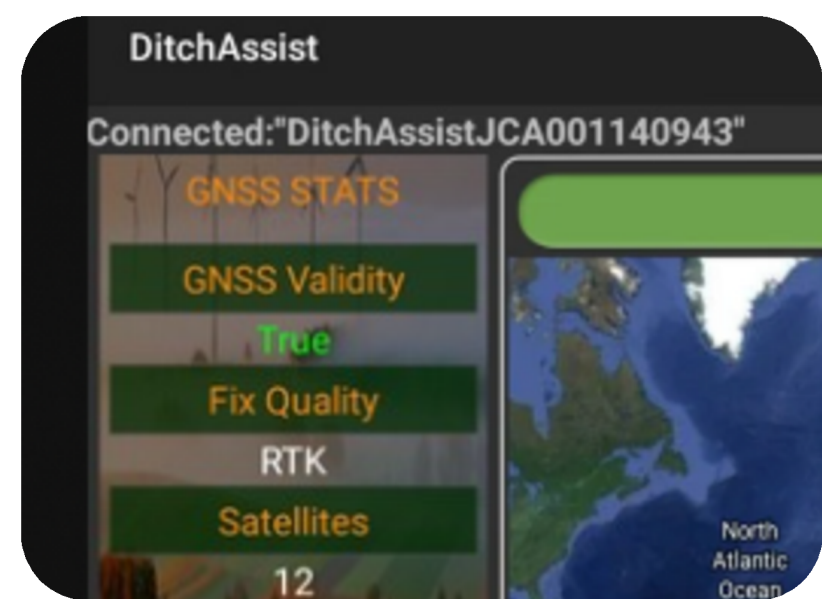
Connect tablet to Ditch Assist Wi-Fi and open the app. Click *Connect Wi-Fi* & verify connection & GPS
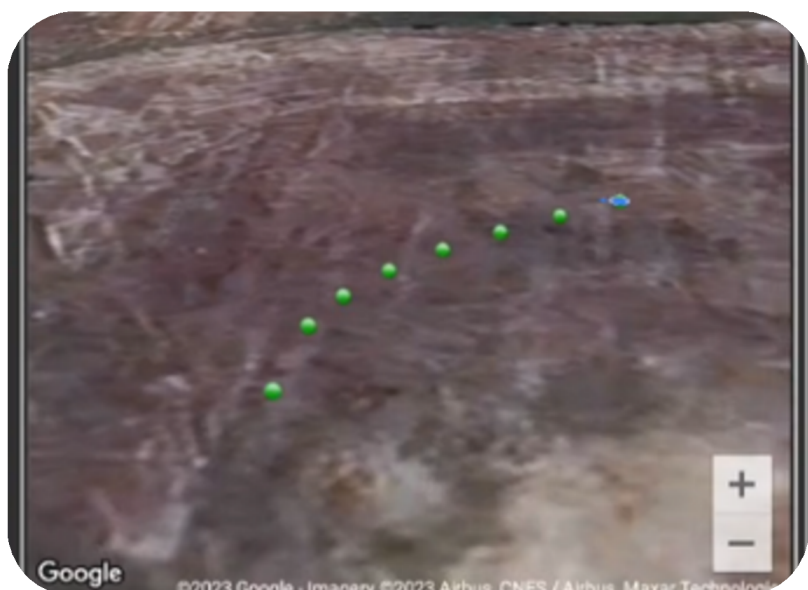
2

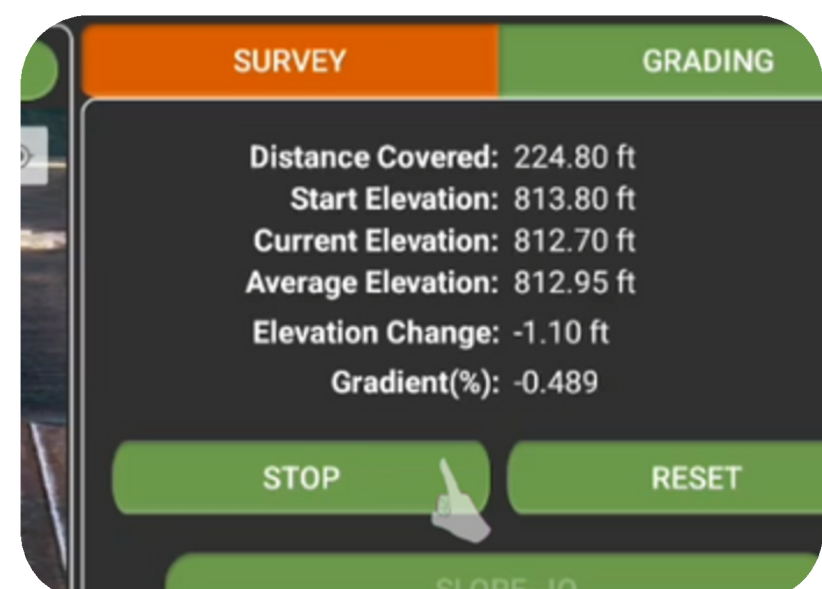Drive to either end of the proposed drain route. Make sure implement is raised in transport position

3

From the SURVEY tab press START button and begin driving

4

Drive the proposed route exactly as you'd like to create your drain. Route can be straight or curved

5

At the end of the run, click STOP. The survey is now ready to use in Slope-IQ designer.

Surveys are saved to your tablet and may be recalled later for use in Slope-IQ. Add them via Manage layers > XYZ Raw File and navigate to the Documents folder on your tablet to find them named by survey date and time.
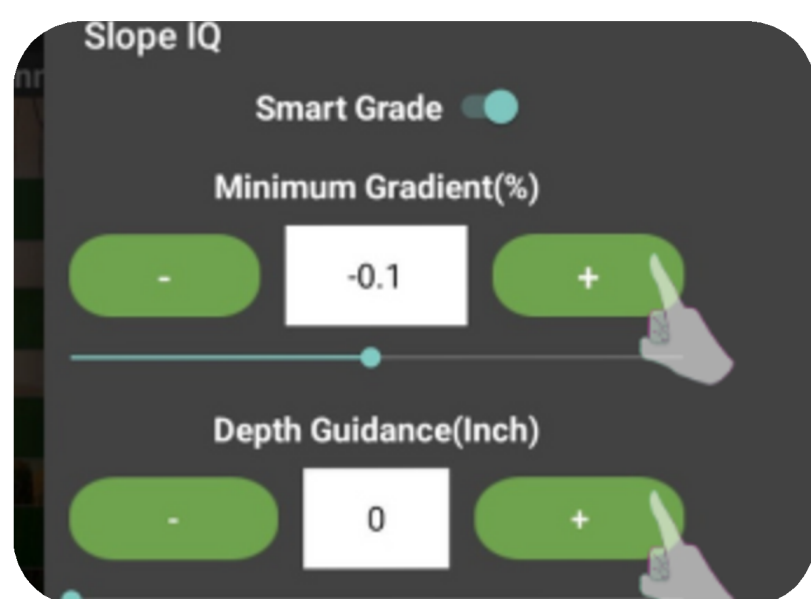
DITCH ASSIST

6. USE SLOPE-IQ

Follow these steps to create a best-fit drainage design!
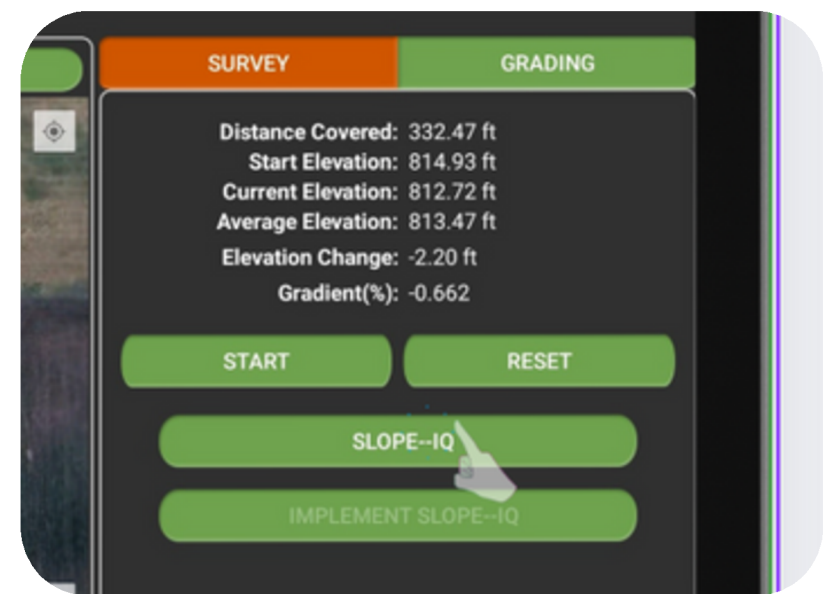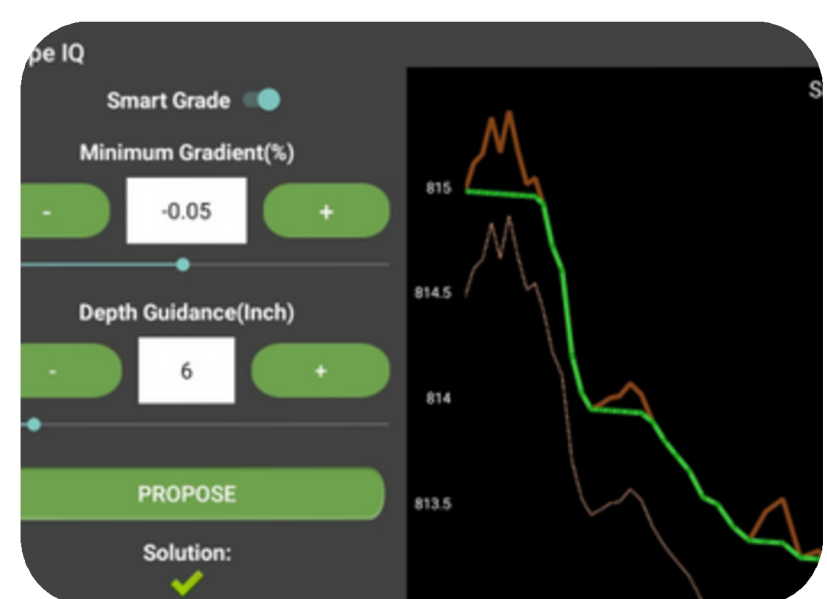

1 After surveying a run, click the Slope-IQ button on the SURVEY screen to open the survey into Slope-IQ
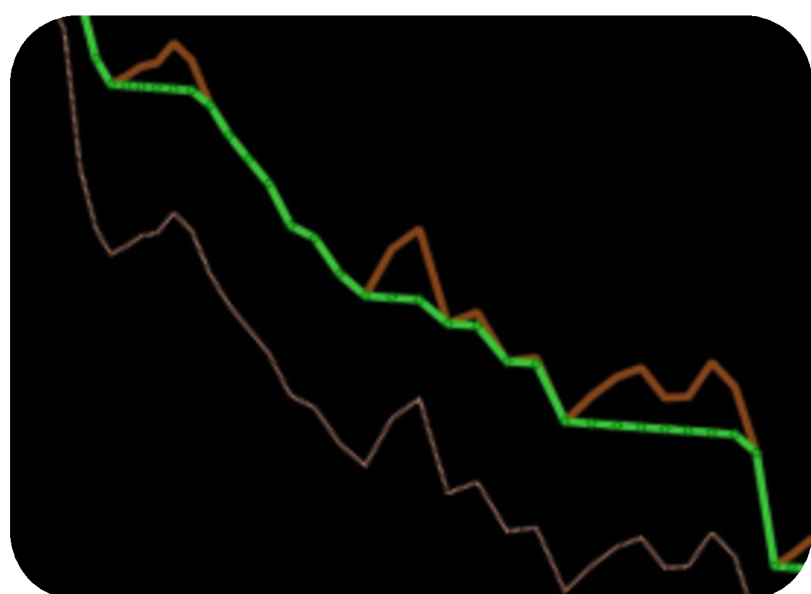

2 Enter minimum acceptable grade (e.g. 0.1% or 0.05%), & optionally a depth guide line to show cut depth
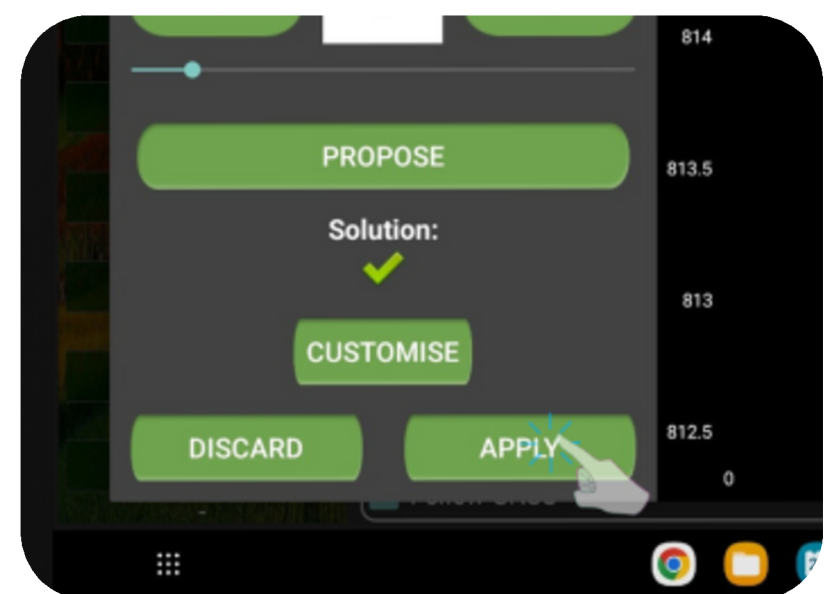

3 Press PROPOSE to view the best-fit solution. Orange line is survey and green is what will be cut

4 If you added a depth guide this will help you visualize how deep you'll be cutting by comparing to green line


5 If you are happy with the design and don't wish to customize it, click APPLY to load it into Grading Engine

Slope-IQ will follow natural slope wherever there is sufficient slope and won't cut any deeper than the existing terrain. Use the NUDGE DOWN function to force the system to cut a shallow amount in these areas if required.
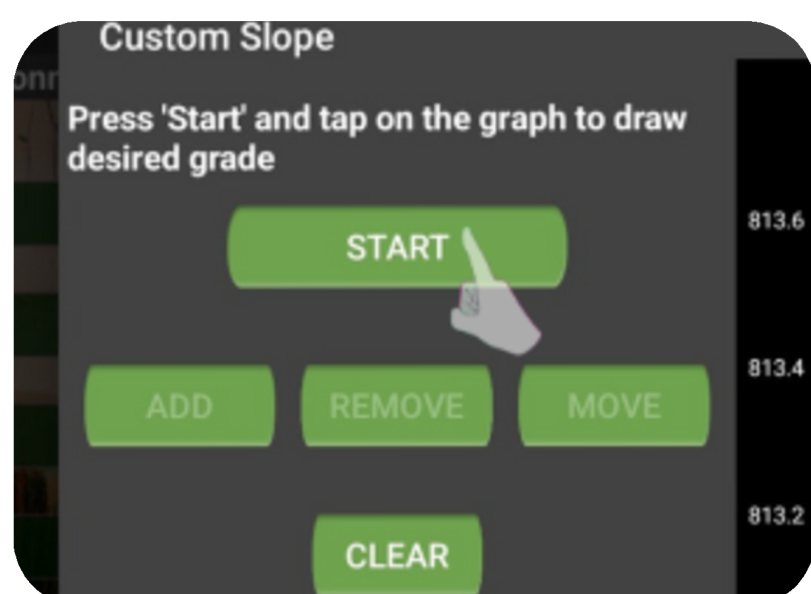
DITCH ASSIST

7. CUSTOM DESIGNS

Follow these steps to create a fully customized drainage design!
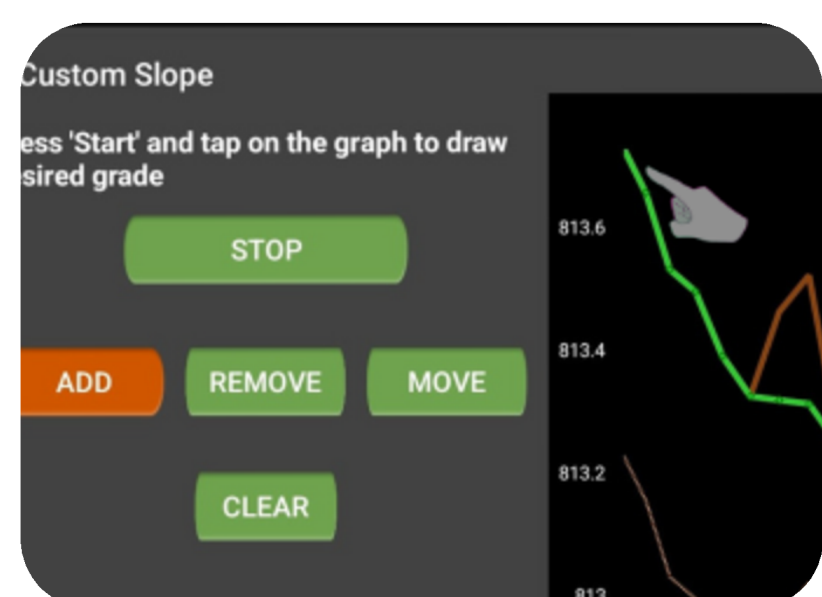

1
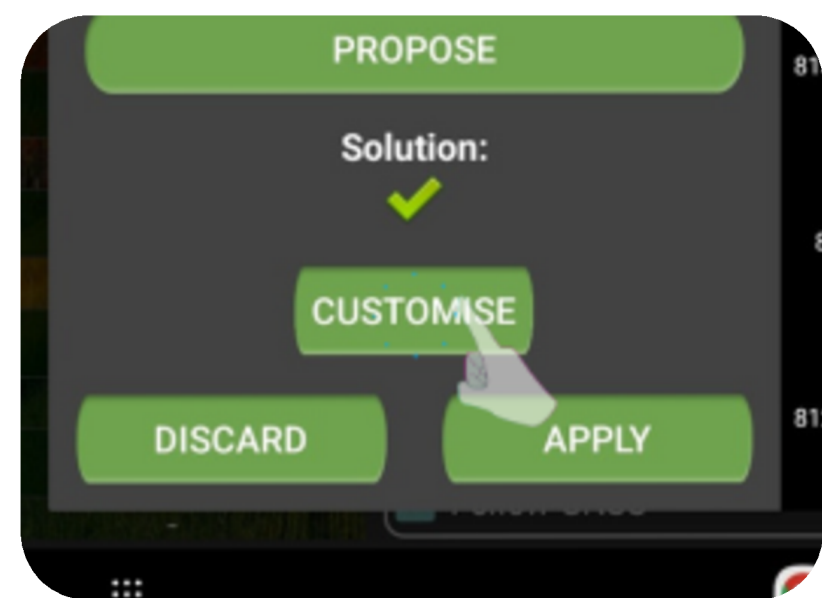
After creating the initial Slope-IQ design, click the CUSTOMIZE button to open the editor
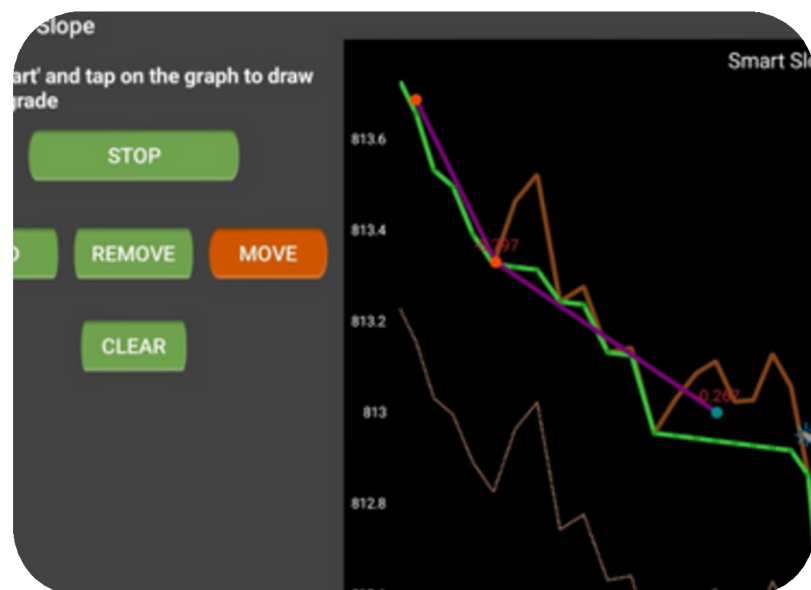

2

Click START and then ADD to begin drawing your custom design

3

Add the first vertex point, then click ADD again to add another. Repeat until design is complete.

4

Move or remove a vertex point by first tapping it so it changes color then using appropriate buttons


5

When design is complete, press STOP and then APPLY to load the design into the Grading Engine

IMPORTANT: Using a custom design will overwrite the entire Slope-IQ design. Ensure you add a custom design line through all areas of the original survey you wish to drain. If you don't, the design elevation from the nearest custom design point will be applied.

DITCH ASSIST

8. AUTO GRADING

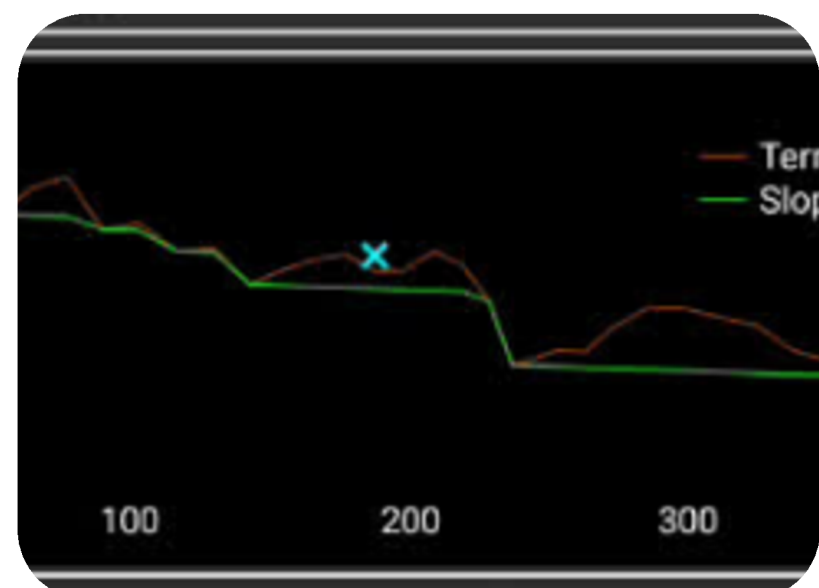## Follow these steps to implement your drainage design!

1
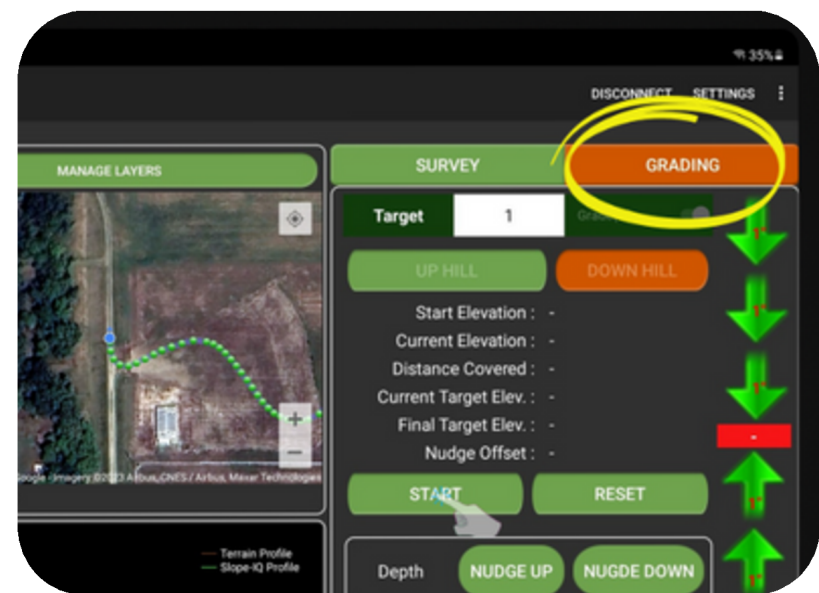
With Slope-IQ or custom design loaded, drive to the start point and tap START on the GRADING screen
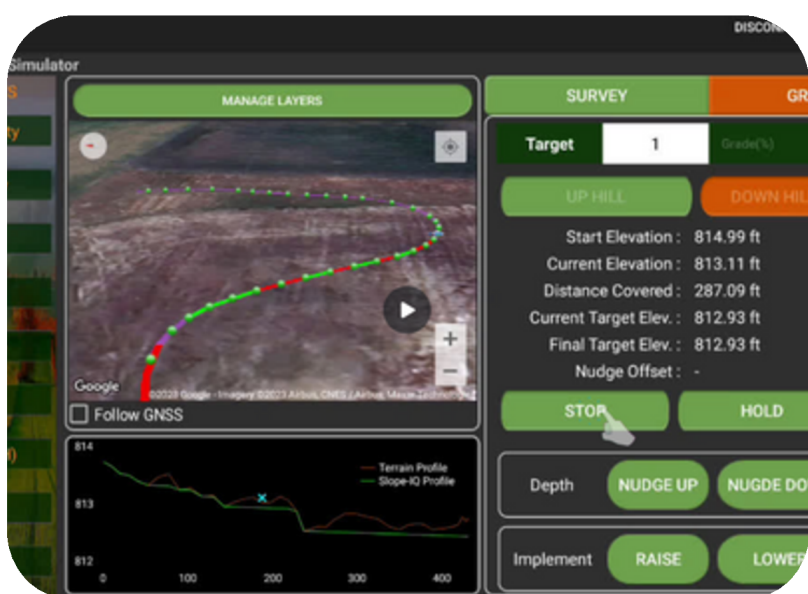
2

The implement should move to the target elevation. Begin driving the original survey route

3

Where cut depth is too deep for current pass, either operate manually or use manual or auto nudge

4

**When unloading press either HOLD or STOP to disable auto grading, then RESUME/START to continue**

5

When drain is complete, press STOP and then RESET both Grading and Survey screens for next survey

You can work in either direction and do not have to drive in the same direction as the original survey. Pressing HOLD when working disables auto grading, but keeps showing you the current target elevation on the lightbar.

◢◣ DITCH ASSIST
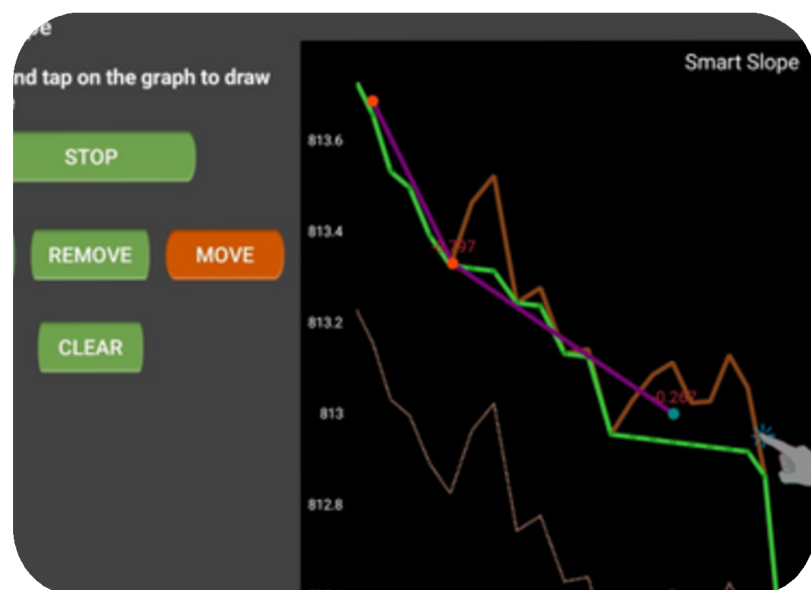
9. AUTO NUDGE

Learn how to use our new Auto Nudge feature!
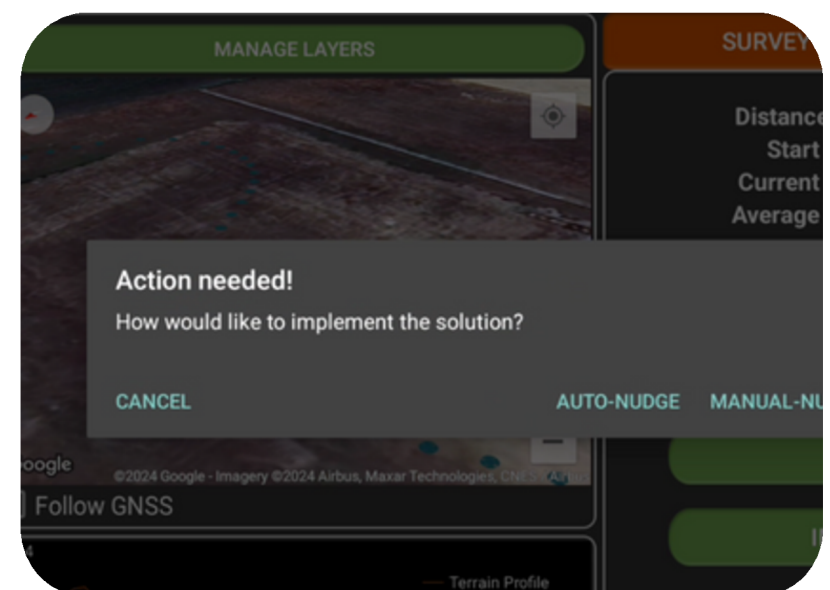
1
Auto-Nudge Max cut (
2.0
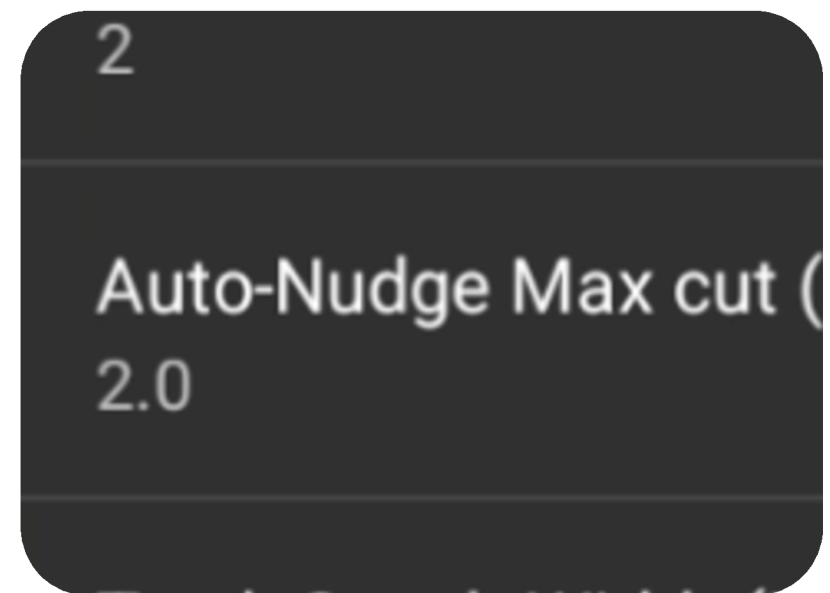
Navigate to Settings and enter the maximum cut you'd like in a single pass.
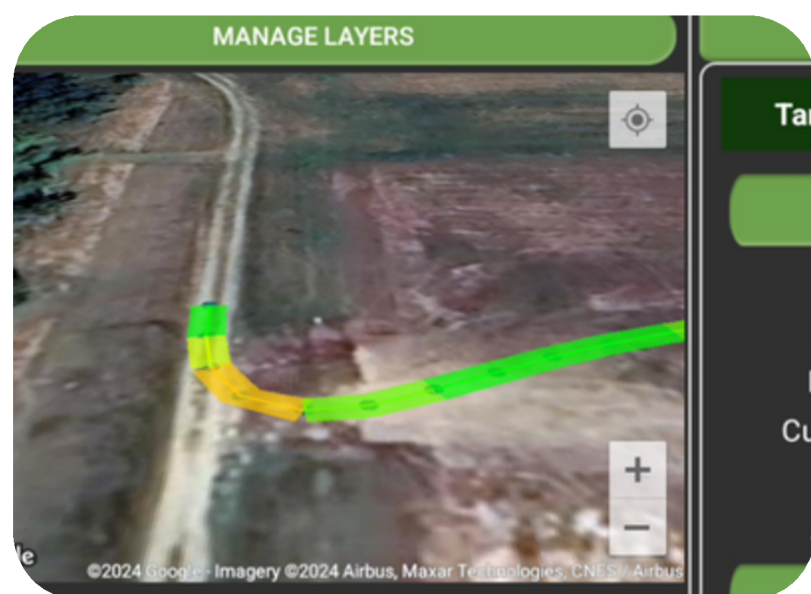
2

Design your best-fit or custom drain as usual, or import a land leveling design with XYZP data
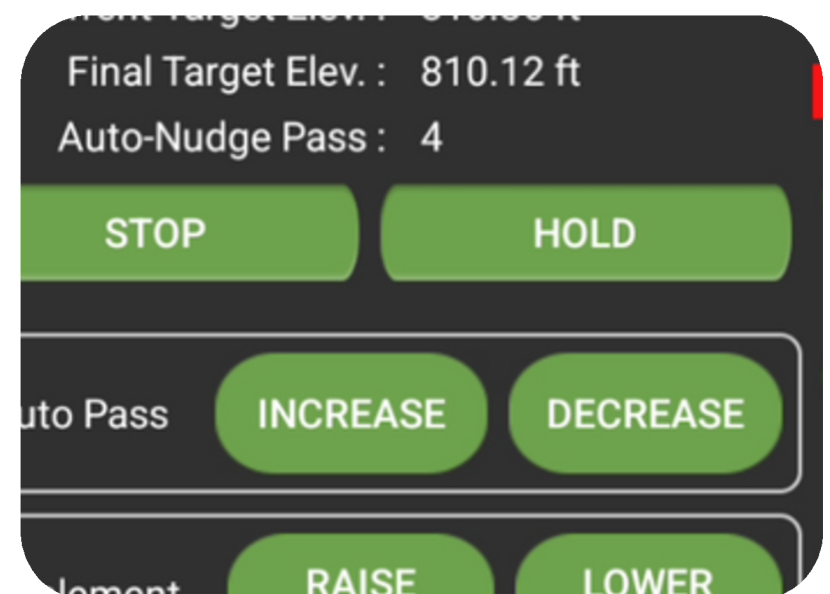
3

When pressing IMPLEMENT SLOPE-IQ choose the option to use Auto Nudge

4

Pass 1 will limit cut to the value set in Step #1. Map coverage color shows you remaining passes required

5

On each subsequent pass, increase the Auto Pass number until the final grade is achieved

When using Auto Nudge, the coverage painted on the map will be colored according to how many more passes are required. RED means 4+ passes still required, ORANGE means 3 passes, YELLOW means 2 passes, LIGHT GREEN means one more pass, and DARK GREEN means the final target is achieved.

◿ DITCH ASSIST
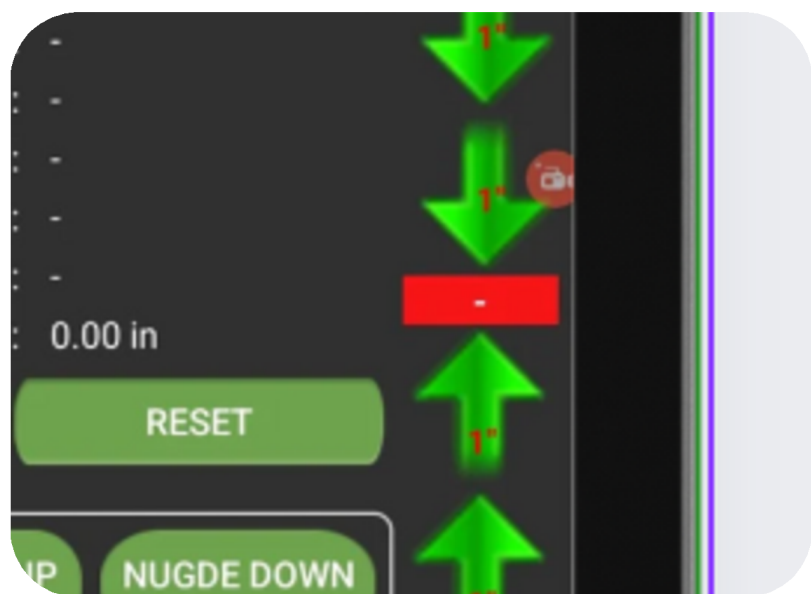
10. TIPS & TRICKS

Some common settings and tools you may use!

1
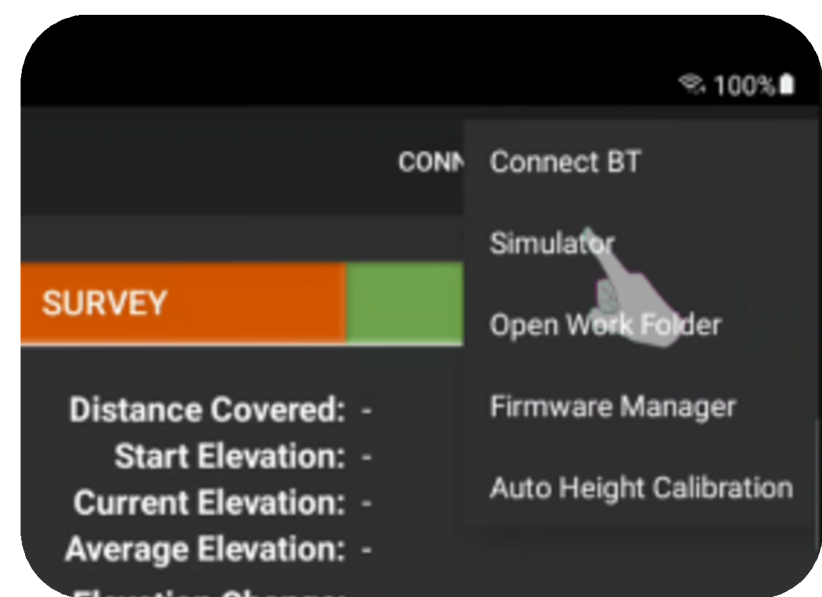
Use the built-in simulator to learn the app or teach new operators using demo GPS messages
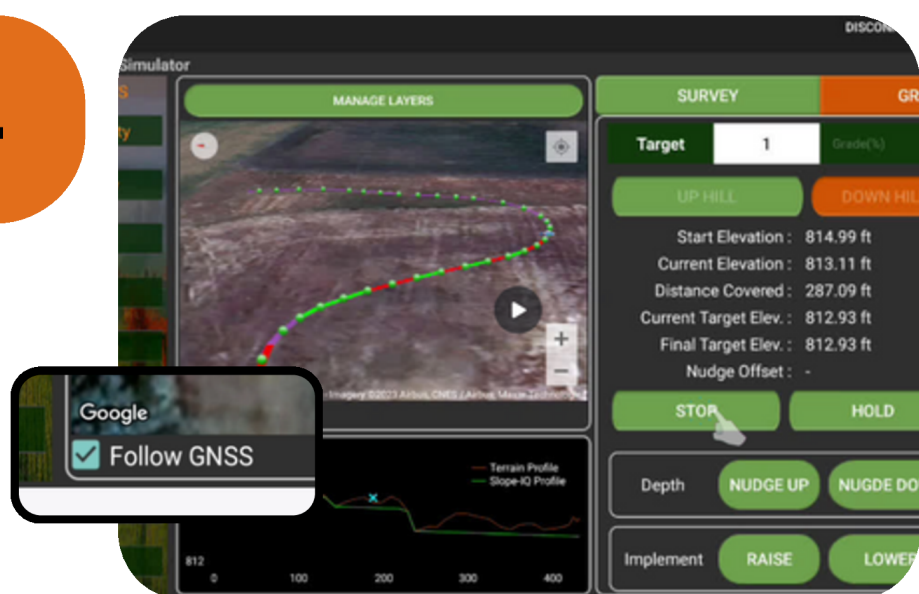

2

Long press on the lighbar arrows to adjust the number of inches/cm each represents

3

Connect your tablet to the Internet and zoom to your fields to download & cache map satellite imagery

4

Checking *Follow GNSS* will zoom the map to your location. Use 2 fingers to tilt and rotate the view

5

Set the Track Swath Width setting to your implement width to see accurate coverage on the map

The best way to learn Ditch Assist and make it work for you is to use it! Consult the user manual for complete information - it's available to download from every page at ditchassist.com!

DITCH ASSIST

11. LOAD IMAGES

How to load image reference layers like drone images or cut-fill maps!

1 Ditch Assist requires a .jpg image format with accompanying .jgw world file with coordinates
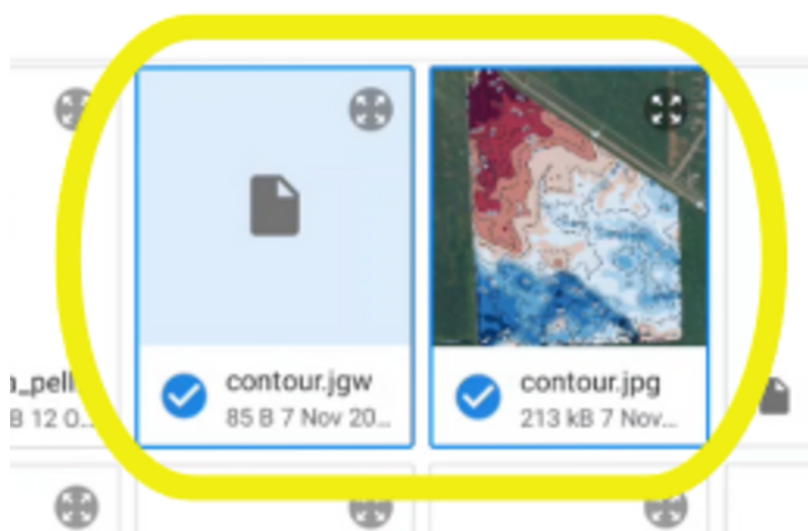
2 The .jgw coordinate system must be in Geographic Coordinates (WGS 84) and not State Plane like NAD83
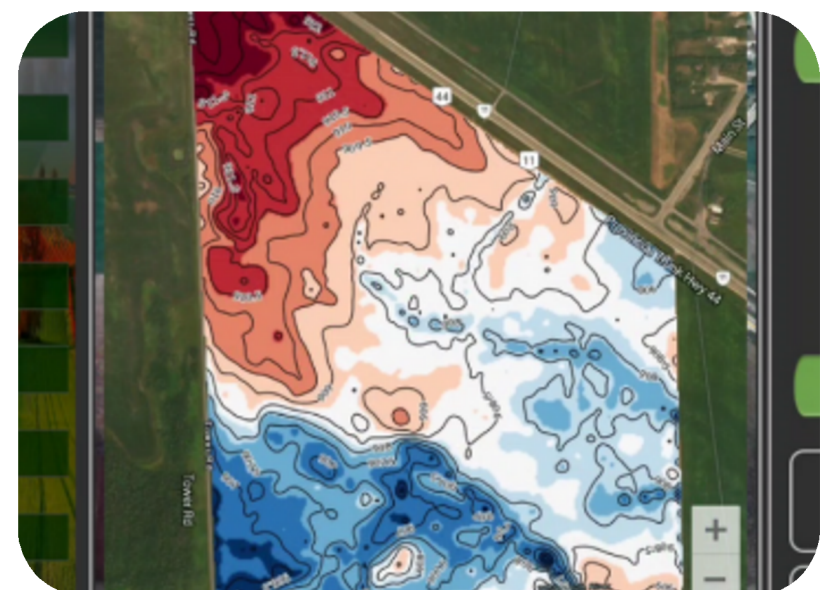
3 Easiest way is to use the free Image Georeferencer on the Ditch Assist website to generate the .jgw file

4 Save both the .jpg AND .jgw in the Documents folder on your tablet

5 Use Manage Layers to add an Image File, then long press and select both .jpg and .jgw files to add to map

You can add any image layer you can screenshot! In Windows use the Snipping Tool or a screengrab app to screenshot any map or overlay, then save it as a .jpg. Use the Georeferencer tool on the Ditch Assist website and follow the video instructions there if required.
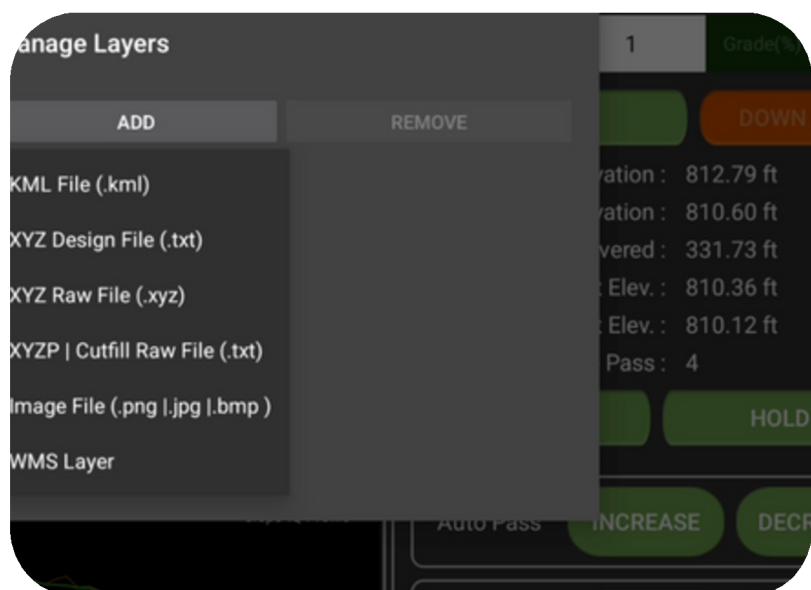
▶◣ DITCH ASSIST

12. LOAD IDM MAPS

How to download Ideal Drainage Mapping layers in available locations!
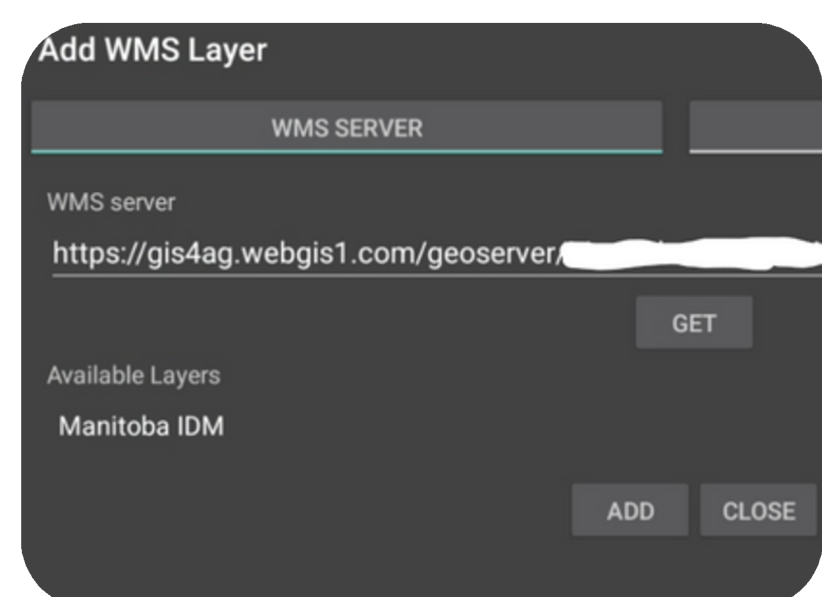
1

Sign Up for complementary access to IDM via the Ditch Assist website & wait for your credentials

2

Connect tablet to the Internet. Open the DA App and navigate to Manage Layers > Add > WMS Layer
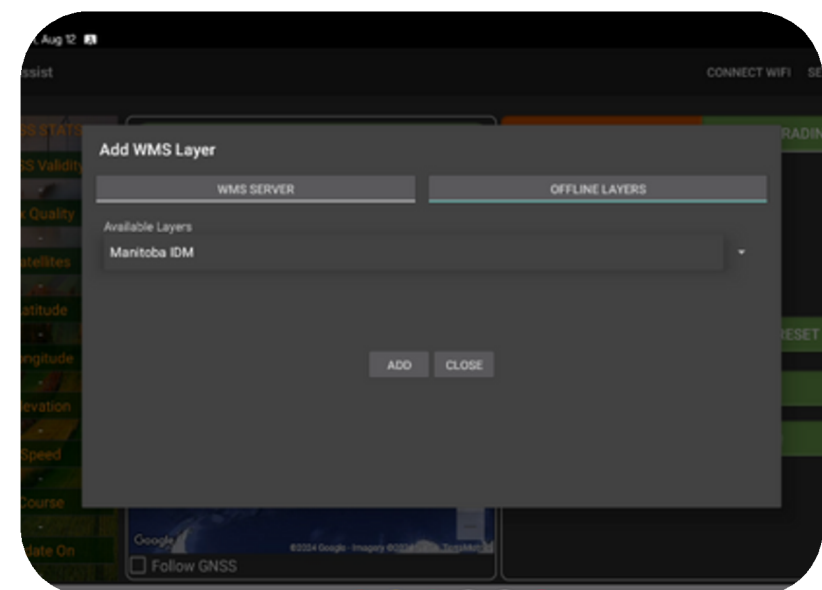
3

Enter the WMS address you received and tap GET. Select the IDM layer and tap ADD

4

Zoom to all your fields to download the IDM layers at different zoom levels and save them for offline use.

5

To load saved layers in the future, go to Manage Layers > ADD > WMS > OFFLINE LAYERS and select

Zoom in at different levels and pan around each field while downloading IDM data. Only the displayed map areas will be saved. IDM layers are saved as small tiles in the Documents > Ditch Assist > TileCache folder. Despite the numerous files, they are small and won't fill your tablet's memory. When reloading saved layers, simply select the layer title. All previously saved tiles will be automatically reloaded and appear when you zoom to a field.
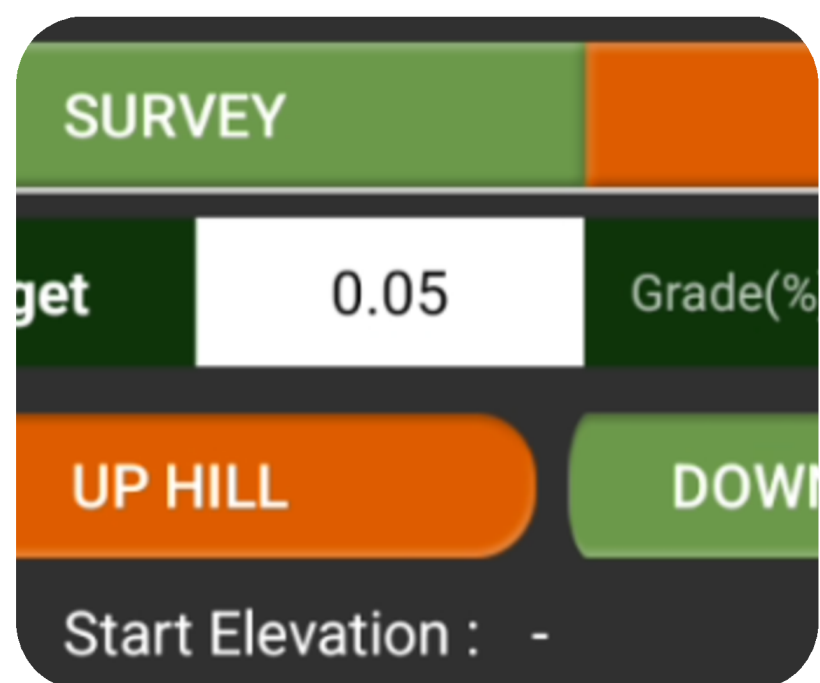
◥ DITCH ASSIST

13. SIMPLE GRADING

Don't want to use Slope-IQ or a custom design? No problem, just enter a grade & go!

1

Drive to the start location (it can be at either end of the run). Lower implement to the ground.

2

Open the Grading tab. Enter your target grade in % in the white box.
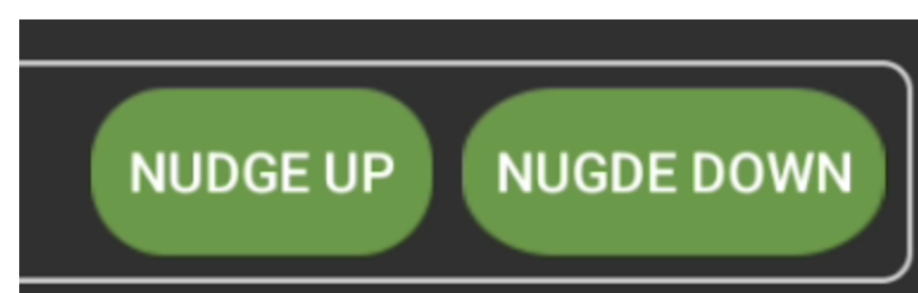
3

Select whether the slope should run UPHILL or DOWNHILL from your starting location

4

Tap START to begin working. The slope will be calculated and implement height adjusted as you move away

5

To set a depth from your start point, use NUDGE DOWN to add an offset and achieve the desired depth

This method will maintain a constant grade calculated in a straight line from your start location to your current location. To implement a grade break, hit STOP > RESET and then enter a new grade and continue from that point.
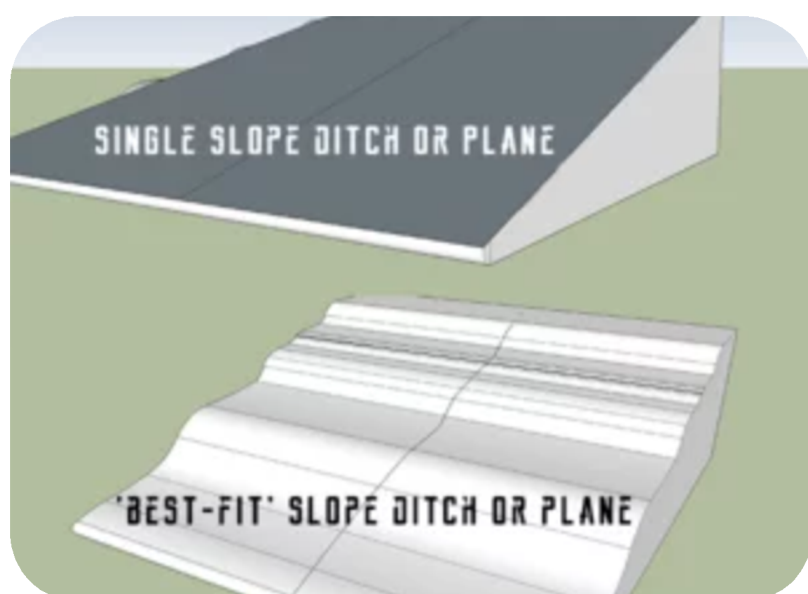
![DITCH ASSIST logo]

14. SIMPLE LEVELING

How to level or create single slope or best-fit planes!

1

To create a flat, level area, lower the implement blade to the desired elevation, enter a Target Grade of _0_, and start working

2

SINGLE SLOPE DITCH OR PLANE

'BEST-FIT' SLOPE DITCH OR PLANE

Anything designed with Slope-IQ can also be implemented as a plane!

3

To grade a larger area, drive down the middle in a straight line and survey it, then design in Slope-IQ

4

Ditch Assist will automatically expand the original survey line, stretching it out at 90-degree angles on both sides

5

As you work parallel to the original route, you'll replicate the design, effectively creating a plane

To create level areas you may also enter a target elevation value, and can use the Auto Height Calibration tool to calibrate your GPS to a benchmark or known elevation. Using these techniques is effective for creating uniform flat areas of virtually any size, however for planes on larger areas it may be more appropriate to use a design from desktop software.

DITCH ASSIST

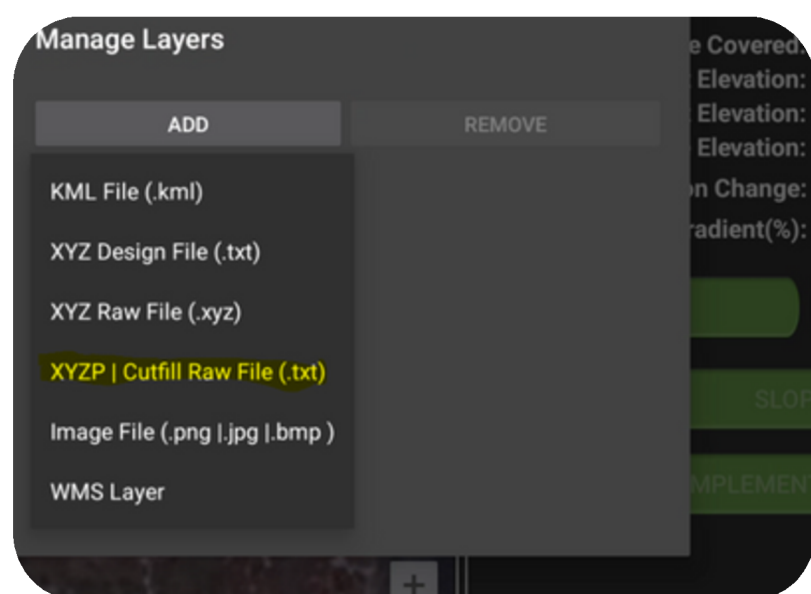# 15. 3D LAND FORMING

How to import and implement advanced 3D designs from desktop software!
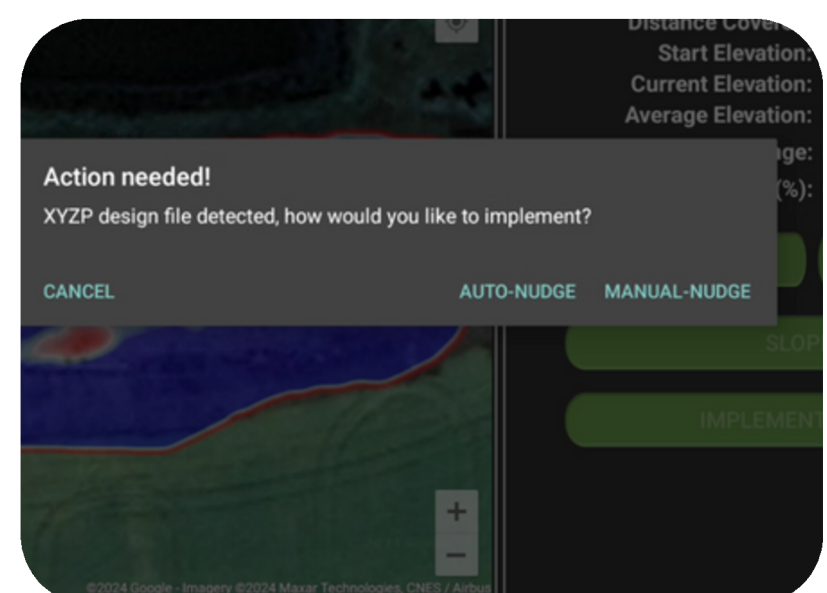
1

Export your land level design as a tab delimited text (.txt) file with attributes as shown above (no column headers)
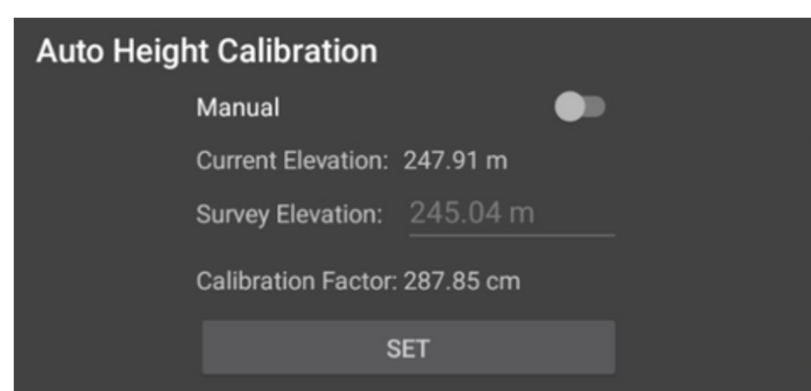
2

Save the .txt file to your tablet. Load it into the App via Manage Layers > Add > XYZP | Cutfill Raw File

3

Select Auto or Manual Nudge. Optionally load cut/fill map image in .jpg format with .jgw file

4

Calibrate your GPS to the original survey if needed by stopping at a point with zero cut/fill or known elevation and using Auto Height Calibration tool

5

Begin working. Ditch Assist will calculate the design elevation at your location and set this as the target

Configure the Ditch Assist App to use metric units for design files. If your design file lacks the original survey elevation column, select XYZ Design File under Manage Layers to import it. Note that Auto Nudge and auto-created cut/fill overlays won't be available. To verify GPS Height Calibration, park at a spot with no expected cut or fill, then hit START. The blade should rest on the ground.

◤ DITCH ASSIST

16. TILE DRAINAGE

Follow these steps to use Ditch Assist for Tile Drainage Installations!
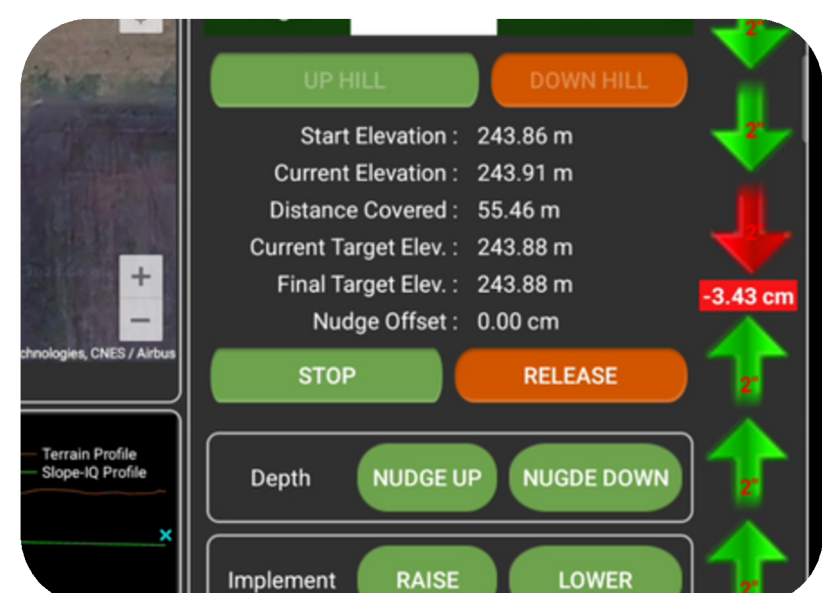
1
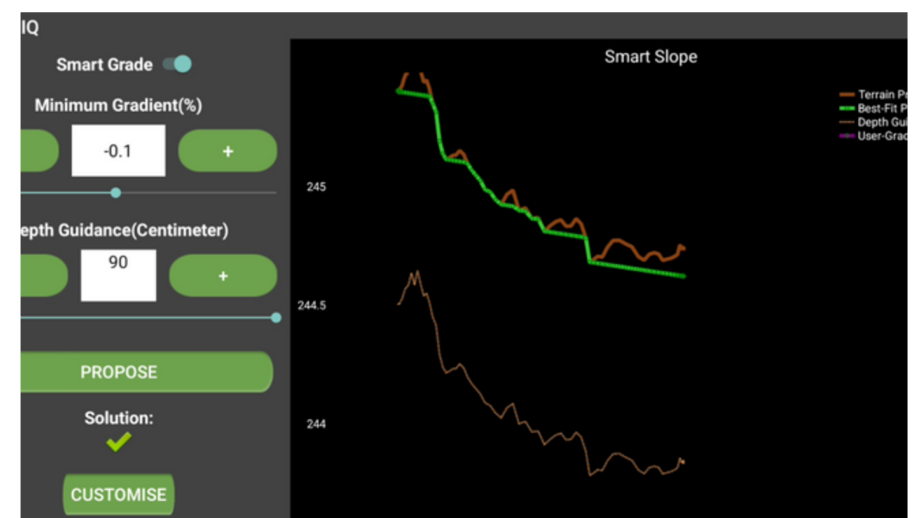
Run a survey and create an initial best-fit design in Slope-IQ. Add a depth guide representing your minimum install depth

2

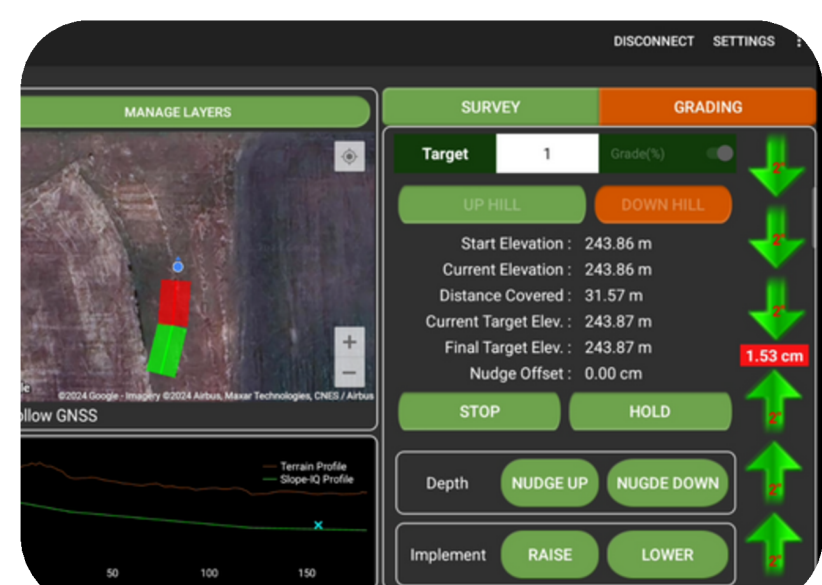Create a Customized design observing minimum depth and grades as well as maximum depths

3

Always install UPHILL. Hit **START** then **HOLD** to lower plow into start hole to indicated depth

4

Operate manually for first few feet to ensure plow is pitched up. **RELEASE** Hold once on grade to enable automation

5

Monitor plow height on design profile during run. At end of run, hit STOP and manually raise plow

IMPORTANT: Remember that Ditch Assist only monitors the plow elevation and not plow pitch. Take care to ensure the shear is pitched upwards at the start of runs and in the event of any recovery from a rock hit or deflection. Install slowly to give hydraulics time to react and avoid sudden grade changes. **Do NOT use Auto Nudge when tiling!**