# Agriculture Water Management, Surface Drainage and Grading

## Laser Land Leveling and GNSS Landforming

WHY LANDFORM

THE TECHNOLOGY

APPLICATIONS

PARTNERS & INTEGRATION

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## Why Landforming

Field drainage has the greatest impact on yield relative to any other factor. Landforming solutions conform soil to complement crop requirements, maximizing yield and reducing inputs.

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## The Technology

Single and dual scraper, laser land leveling, and GNSS landforming solutions. Easy-to-use survey, design and execution workflows.

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## Applications

Commodity crops, specialty crops and many niche applications such as roads and ponds. Planar and variable slope designs for any operation.

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## Partners & Integration

Array of easily integrated modular technology for increased efficiency and profitability. Innovative and independent with dedicated networks and OEM teams.

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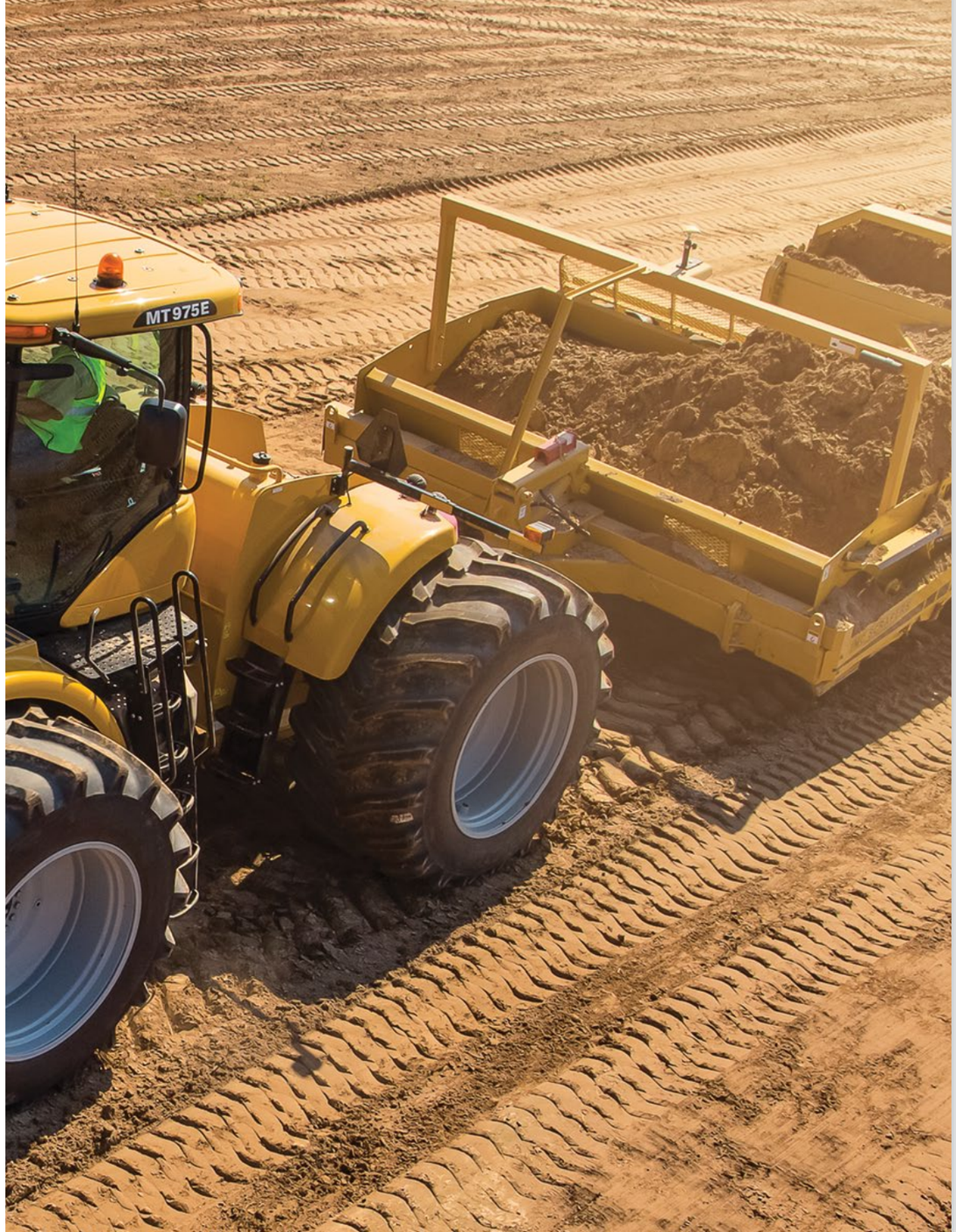


# Topcon Agriculture

High-precision hardware, software and data to bring you efficiency and enhanced productivity to every phase of the farming operation.

LANDFORMING

# Why Landform

It’s no mystery that water is essential to every farming operation. Research indicates field drainage has the greatest impact on yield relative to any other factor. It boils down to distribution uniformity, because crops require adequate and equal resources to thrive.

With global uncertainty in allocation, not to mention constant environmental and even political factors, farmers need proven solutions that maximize inputs and land sustainably. Landforming is the practice of manipulating soil to optimize water management and drainage. Modern solutions utilizing laser and GNSS (aka GPS) conform land to best suit operational demands. Technology is the foundation for an effective precision management strategy, from basic flat and single to advanced multi and variable-slope surfaces.

# Increase yield through design and uniformity

Landforming technology manipulates soil to better compensate for environmental factors and complement crop requirements. Through planning (surveying), design, and precision execution, farmers can optimize water management, improve drainage, and even increase arable land.

Solutions not only eliminate catastrophic issues such as flooding and excessive runoff, they promote even-resource distribution. Balanced inputs lead to uniform emergence and development, maximizing available water and reducing applications later down the crop cycle. Symmetry enables higher yields and reduced inputs.

Crop Optimized

Promote Uniformity

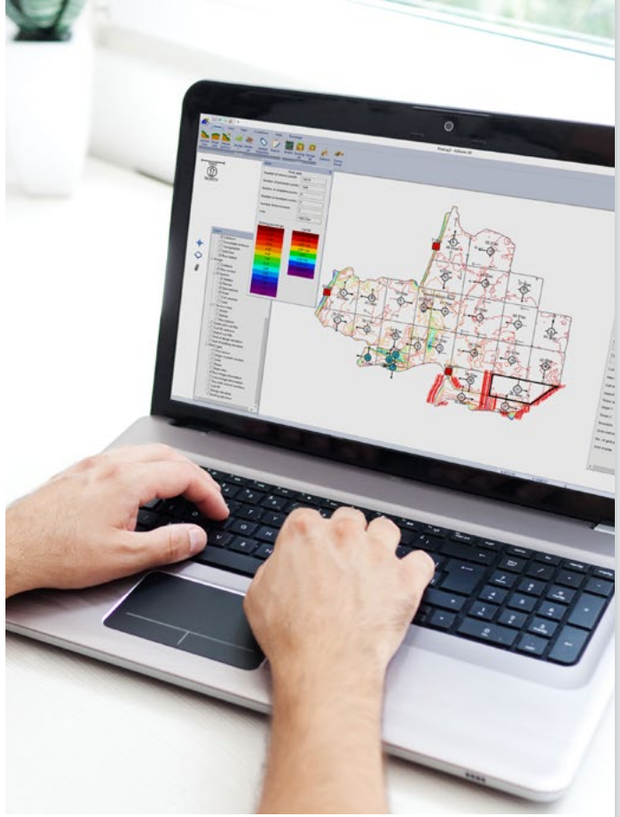

# Reduce inputs through precision

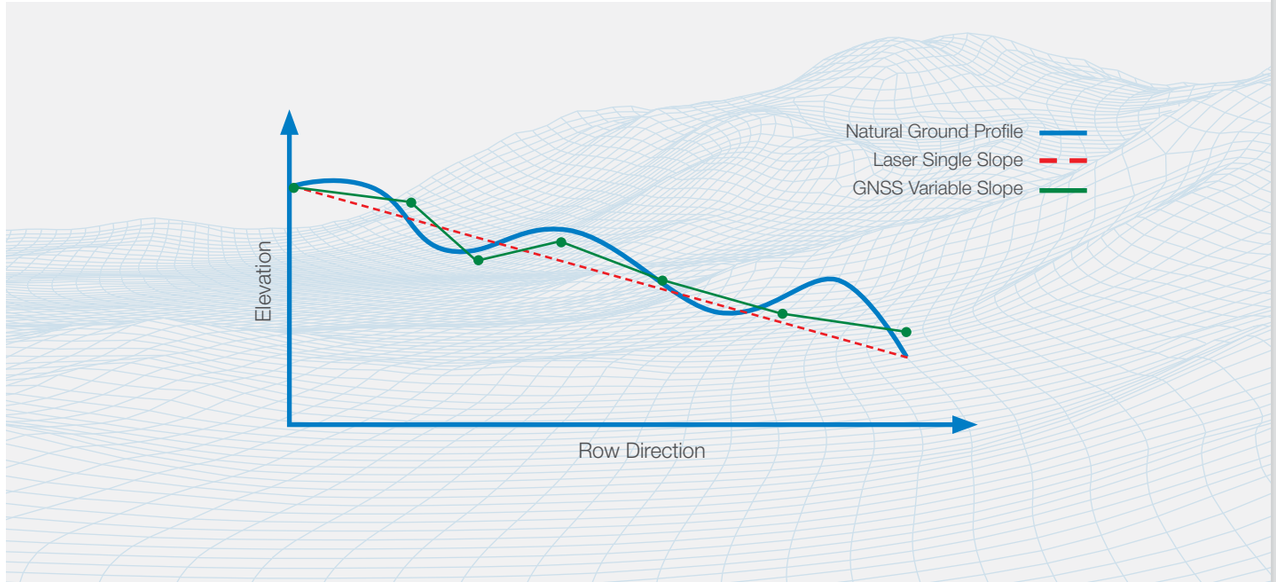
While laser land leveling can be relevant in areas with impacted reception (such as canopy cover), satellite-based landforming brings entirely new input reduction benefits. It is easier to set up and operate for improved in-field efficiency, and solutions promote sustainable practices.

From basic flat, single- and dual-slope planar surfaces to innovative variable slope, satellite positioning enables optimized route planning. In landforming, that means moving the least soil possible, reducing fuel and machine maintenance. Limiting soil disturbance also retains fertility, which is essential to farming longevity.

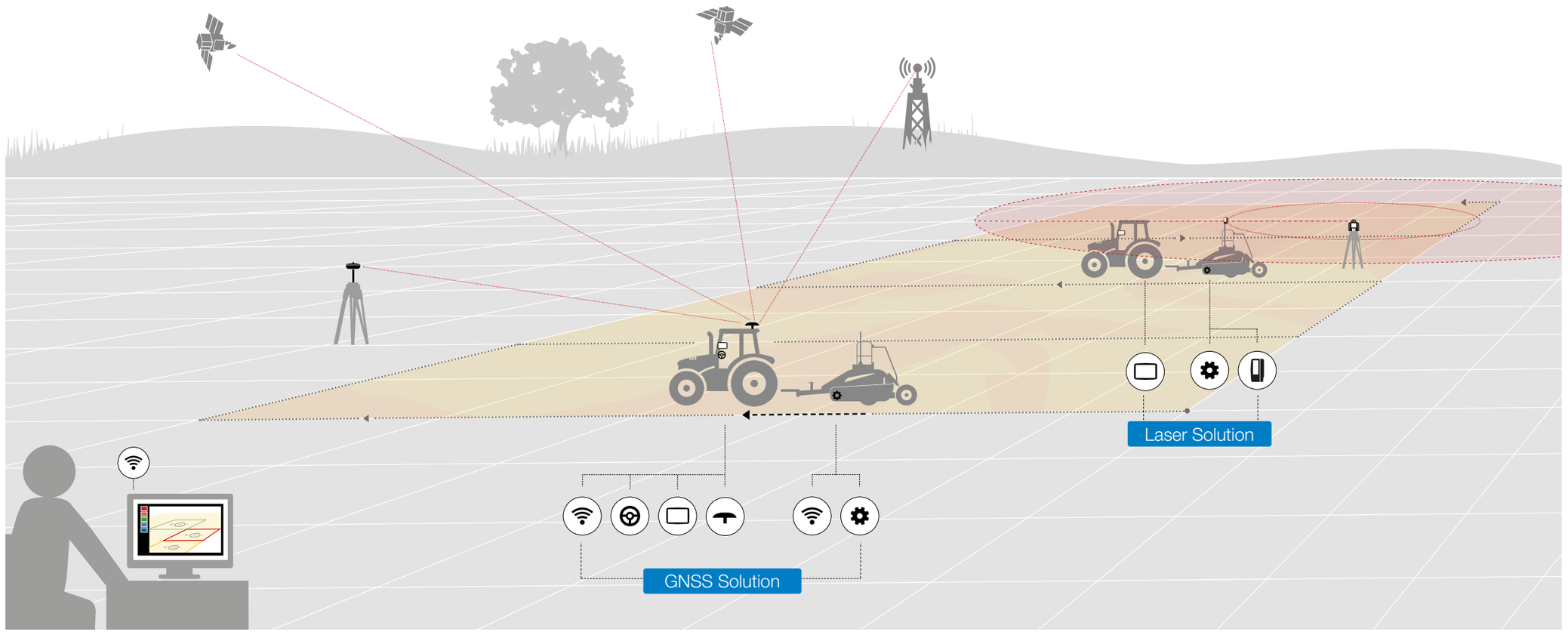
**GNSS Benefits**

- 50%+ less soil moved
- Proactive (GNSS) versus reactive (Laser)
- Fertility maintained adhering to natural design profile





# We offer Laser and GNSS Landforming Solutions






GC-35

RL-200 2S

LS-B200W

# Laser Land Leveling

From basic flat to single-slope, Topcon Laser Land Leveling provides proven automatic single scraper implement control, leveling to a defined elevation. The solution is ideal for smaller, more economical operations and basic applications including flat-plane crops and building foundations.

Laser technology can be useful in heavily covered areas (e.g., tree canopies) where satellite can't penetrate.

## Featuring

- Easy-to-use, proven laser technology
- No outside connectivity required
- Flat, single- and dual- slope, single scraper control
- Universal scraper implement compatibility




# GNSS Landforming

From basic flat and single-slope surfaces to advanced multi- and variable slope designs, Topcon GNSS Landforming offers fully customizable water management control. Comprising three key phases: survey, design, and execution, the solution can suit virtually any crop operation plus many niche applications, including ponds, building foundations and roads.

Operators can efficiently survey with proven base station and rover hardware. Data can be relayed via Bluetooth® to AGForm-3D design software to create tailored planar or variable slope designs. AGForm-3D offers unique patterns that move the least volume of soil possible, maintaining fertility and reducing inputs while optimizing water delivery and drainage. Easily execute by importing to Topcon X Family consoles (XD+ or X35), including a live positioning and cut/fill map on-screen. Tied to the MC-R3 controller/receiver and MC-A1 scraper antennas, the custom AGForm-3D design is automatically executed through the field.

## Featuring

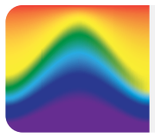
- Flat, single- multi-, variable slope, single or dual scraper control
- Designs move minimal soil
- Complete survey, design, and execution package
- Easy setup and operation. 24/7, dust or fog

# Easy survey. Smart design Effortless execution

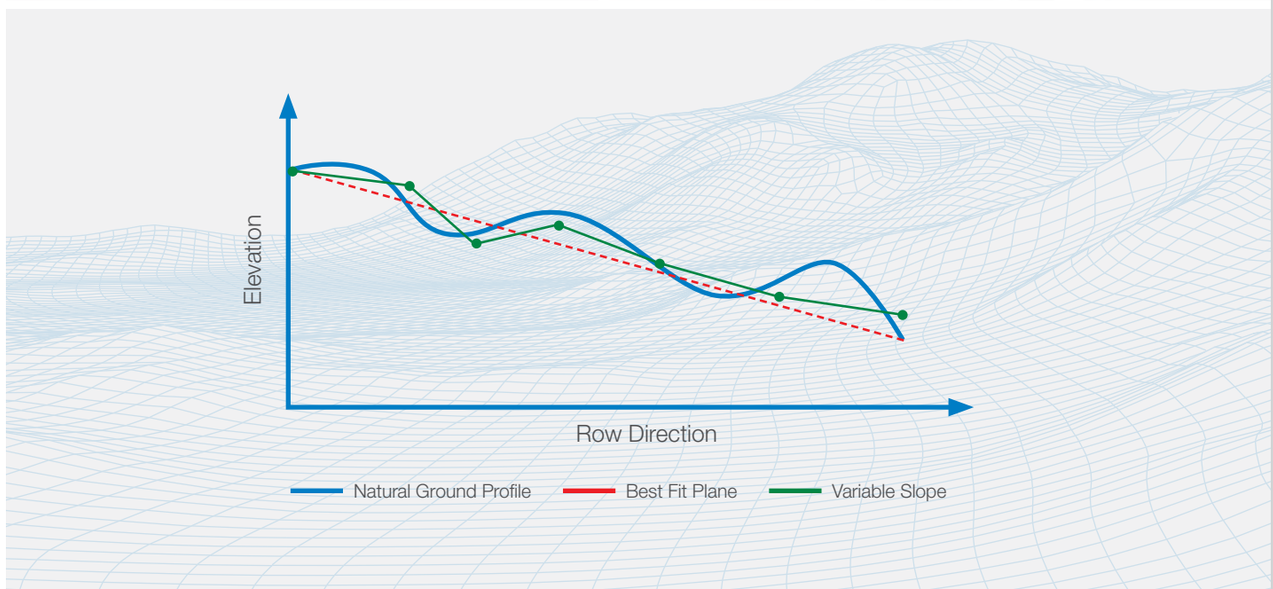
GNSS Landforming has revolutionized land leveling by streamlining workflows and enabling designs that just aren't possible through previous laser methods. Our surface drainage expertise is produced through decades worth of engineering research to understand optimized patterns based upon operational requirements. We offer an array of and continue to develop unique design algorithms.

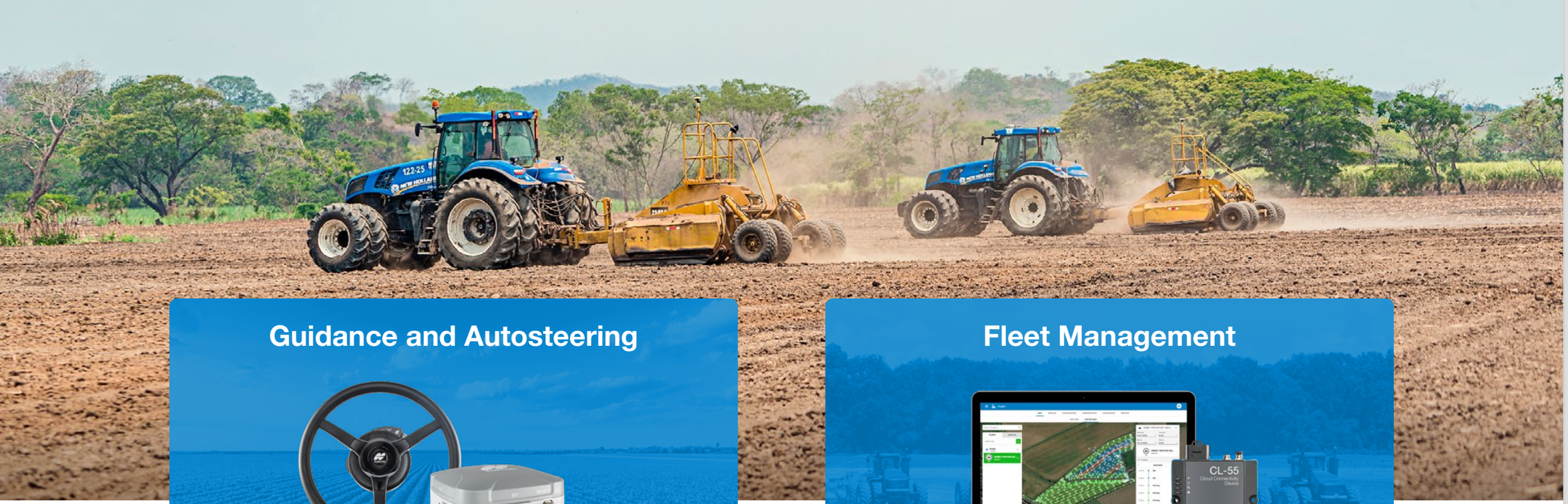
Our innovative survey and design software, AGForm-3D, allows farmers to go beyond simple planar designs to variable slope, complementing environmental and crop production factors. The designs not only allow for customized water management and drainage, they enable significantly less soil movement (i.e., only what's necessary) by retaining natural designs. That means fewer development inputs and better soil health for increased production.

**Planar**
Flat, single, dual, multi, hinged



**Variable Slope**
Crop and environment complementary





## Guidance and Autosteering



Guidance is the key to accuracy and the heart of precision farming. We offer modular solutions to suit virtually any machine and operation.

Each farming operation may have differing accuracy requirements, which is why we offer a full range of correction services via Topnet Live network corrections or localized base stations. Whatever the application, choose flexible options to form the right solution for optimal reception, accuracy, and repeatability.

## Fleet Management




Monitor and manage machines through TAP Fleet and CL-55 cloud connectivity device telematics. Beyond a powerful landforming solution to optimize water management, we can help track the benefits too.

# Suited for nearly all crops and many niche applications

## Commodity Crops

Corn, soybeans, wheat, cotton, rice, etc.

## Specialty Crops

Fruit, sugar cane, vegetables, vineyards, orchards, etc.

## Niche

Driveways, roads, horse tracks, building foundations, etc.

Click on the image to watch a video.

Use case

# Hacienda Solimar – GNSS Landforming Enabling Vertical Integration

**Problem**
Hacienda Solimar is a unique operation in Costa Rica focused on sustainable livestock management. Suffering from expensive third-party feed costs and low production on site, a solution was needed to allow continued expansion and scale livestock production profitably.

**Solution = Topcon GNSS Landforming**

1. Enabled vertical integration to produce own feed
2. Created arable land where crops wouldn't otherwise grow
3. Reduced soil movement and machine fuel consumed
4. Enhanced crop quality and quantity
5. Boosted livestock production



Click on the image to watch a video.

Use case

# Louisiana Contractor Reaps the Reward of GNSS

**Problem**
David Bader has been on the front lines of precision landforming and construction sitework for decades. Successful with laser technology in the early 2000s, he needed a way to better scale his services and guarantee reliable results through long working hours.

**Solution = Topcon GNSS Landforming**

1. Improved organization – All software consolidated into one PC
2. Improved efficiency; design software reduced overall passes
3. Reduced fuel and machine maintenance through design
4. Maintained fertility by moving less soil
5. Reduced worker fatigue with more reliable output

Click on the image to watch a video.

Use case

# Azucarera El Viejo - Boosting Sugar Cane Production in Costa Rica

**Problem**
Azucarera El Viejo leads the Costa Rica rain-fed sugarcane industry, with roughly one million tons annually. Laser land-leveling survey and design were deemed too inefficient for such a large operation – they needed an alternative.

**Solution = Topcon GNSS Landforming**

1. Reduced labor with GNSS survey and design software
2. Increased production with customized variable slope design
3. Reduced fuel and maintenance, moving 50% less soil compared to the previous laser approach
4. Improved efficiency with easy-to-use workflows



Click on the image to watch a video.

Use case

# Ingenio Taboga - Expanding Capabilities in Rice and Sugarcane

**Problem**
Ingenio Taboga, a large sugar producer in Costa Rica, began land leveling their rice ground with our laser solution in the 1980s. After the success of field leveling rice, Taboga began to level their sugar cane fields. Although field leveling was improving production, too much labor was spent on survey and design.

**Solution = Topcon GNSS Landforming**

1. Reduced labor through GNSS survey and design software
2. Improved furrow development and production by integrating autosteering
3. Ensured quality through post-survey verification

LANDFORMING

# Committed to Partners and the Industry

We are the ideal partner for developing advanced solutions for your positioning, agriculture and machine control challenges. Our experience, technical expertise, and overall company strength make us uniquely qualified to provide enhanced automation technology. Ultimately, this will drive your customers' productivity - and your market share - to ever-higher levels.

**SPEED TO MARKET | GLOBAL NETWORK | EXPERIENCED OEM TEAM**

# A History of Topcon Corporation in Agriculture

**1932** — Founded in Tokyo

**1953** — Topcon 35A Camera

**1974** — Boom Height Control

**1981** — On-board Weighing

**1994** — Laser Land Leveling

**2004** — GNSS Land Leveling

**2006** — GNSS Guidance / Autosteering

**2008** — Implement Control

**2010** — Crop Monitoring

**2013** — Enhanced Autosteering

**2018** — Data Management

**2020** — Customizable Consoles and Software

**2020** — Connectivity

**Today** — Embedded Technology

Note, displays current product images in reference to when development began.

# Trust Topcon to get you there faster with high-quality positioning and automation solutions tailored to your product strategy.

## Independent solutions

In an industry with many contractual alliances, we remain independent. We have the freedom to develop technologies that best fit your unique goals. Our custom OEM solutions are all clean-sheet designs, providing more opportunities to differentiate your product from the competition.

## Speed to market

Product development carries an inherent pressure to do everything faster and better than before, particularly since technology is only viewed as innovative if it arrives before the competition. Our experience helps simplify and shorten the design process, allowing you to go to market with your product faster – and with the utmost confidence.


**4900+ Employees | 2150+ Patents**

## Global Network

With an extensive worldwide network of corporate offices, R&D centers and technical groups, we have an unmatched capability to assist any manufacturer, no matter where they are located, with fully integrated machine automation solutions. This also positions us to create programs to assist and support dealer networks, directly or through extensive training programs.

## Experienced OEM Team

Our experienced OEM team knows what questions need to be answered first and the potential pitfalls to be avoided along the way. Their first objective is to make sure our technology is the right fit for your application and be your partner every step of the way.

# Easily Integrated Modular Technology

## Guidance

| Consoles | | Steering |
|---|---|---|
|  X25 |  X35 |  AES-35 |
|  XD |  XD+ |  ACU-1 |
| | |  EHi Valve |

## Correction Services

| GNSS Receivers | | Base Stations & Reference Stations Network | |
|---|---|---|---|
|  MC-R3 |  AGM-1 |  MR-2 |  HiPer VR |
|  AGS-2 | |  CL-55 |  SRL-35 |
| | | |  Topnet Live |

## Digital Farm Management

| Data Software | Connectivity |
|---|---|
|  Machine |  CL-55 |
|  Crop | |
|  Livestock Feed | |

Click a product block to be directed to the respective web page.

# Customizable Solutions for Every Application

## Soil Preperation

| Landforming and Drainage | | | Tillage | |
|---|---|---|---|---|
| GNSS Landforming | Laser Landforming | | Tillage Depth Control | Strip Till Control |
| **Hardware** | | | | |
| MC-R3 Receiver/Control | TM-1 Electric Mast | RL-200 Series Slope Laser | HCM1 Controller | Apollo CM-40 Controller |
| HiPer VR Survey/RTK | LS-B110 Receiver | System 5 Series Controller/Display | UC7 Ultrasonic Sensor | |
| **Software** | | | | |
| AGForm-3D Survey/Design | | | ISOBUS | Horizon OS |
| Horizon OS | | | | |

## Seeding

| Seeding | | Planting | Transplanting |
|---|---|---|---|
| Air Seeding Control | Seed Drill Control | Mechanical/Row Planting Control | Transplanting Control |
| **Hardware** | | | |
| Apollo CM-40 Controller | Artemis AM-1 Controller | Apollo CM-20 Controller | Apollo CM-20 Controller |
| | MFDC 100 Seed Drill Monitor | CAN Motor | |
| **Software** | | | |
| Horizon OS | ISOBUS | Horizon OS | ISOBUS |
| | | ISOBUS | |

## Crop Care

| Spreading | Spraying | | Crop Monitoring |
|---|---|---|---|
| Spreading/Slurry Control | Spraying Control | Boom Height Control | Crop Health Monitoring |
| **Hardware** | | | |
| Athene SM-1 Controller | SL2 Convertor (Weigh) | Apollo CM-40 Controller | HCM1 Controller | CropSpec Sensor |
| Apollo CM-20 Controller | LMS-20 Sensor | | UC7 Ultrasonic Sensor | |
| **Software** | | | | |
| ISOBUS | Horizon OS | ISOBUS | Horizon OS |
| | ISOBUS | | |

Click a solution/product block to be directed to the respective web page.

# Customizable Solutions for Every Application

## Harvest

| Yield Monitoring | | Grain Cart Weighing |
|---|---|---|
| Commodity Harvester Yield Monitoring | Specialty Harvester Yield Monitoring | Grain Cart Weighing |
| **Hardware** | | |
| YM-1 Controller | Optical Sensor | YM-2 Controller |
| GT560 Indicator | CL-55 Connectivity Device | |
| Moisture Sensor | | Load Sensor |
| Load Sensor | | |
| **Software** | | |
| Horizon OS | Horizon OS | TAP |
| ISOBUS | ISOBUS | |

## Weighing

| Material Handling / Onboard Weighing | | Universal Weighing |
|---|---|---|
| Tipping Trailer Weighing | Loader Weighing | Implement Weighing |
| **Hardware** | | |
| TT Weigh+ Indicator | Weighlog 300 Indicator | SL2 Convertor |
| Pressure Sensor | Weighlog a10 Indicator | Cab Control App Indicator |
| | Pressure Sensor | Load Sensor |

## Feed Management

| Livestock Weighing | Feed Mixing | |
|---|---|---|
| Livestock Weighing | Feed Mixer Weighing | |
| **Hardware** | | |
| SW300 Indicator | Load Sensor | 2810BT / 3410B Indicator |
| TAP FEED App | | |
| Weighing Platform | SL2 Convertor | Load Sensor |
| **Software** | | |
| TAP FEED | | |

Click a solution/product block to be directed to the respective web page.

# Committed to Sustainability

The work we do as an organization complements and supports the sustainable development goals adopted at the UN Summit in 2015.

“The Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including poverty, inequality, climate change, environmental degradation, peace and justice.”

To learn more about our commitment to sustainability visit:
**topconpositioning.com/sustainability**


## Zero Hunger

Our tools improve the management and measurement of cropping areas and sustainable agriculture. Through automation, we are helping create more productive crops and increase harvests, which leads to an improved food system and less food shortages.


## Industry, Innovation and Infrastructure

We help farmers be more productive through proven, innovative agricultural precision measurement technology, resulting in increased productivity, larger yields and reduced labor.

TOPCON

Grow without limits.

topconpositioning.com

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