

## Expertise in Agricultural Technology

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### Agricultural machinery, mechanical and facility engineering

- Development and prototyping of agricultural machinery
- Systematic validation through field trials
- Factory and production planning for existing or in-house developed machinery

### Robotics

- Development of application-specific robotics and end-effectors with selectable kinematics, mechanical structure, and drive systems
- Custom applications using commercially available and in-house developed robot systems

### Control and Regulation

- AI-based process control and management
- Complex process sequence control and HMI programming

### Measurement technology

- Surveying of large structures, including data processing
- Integration of optical measurement technology with mobile carrier systems such as tracked vehicles, legged robots, or ROVs
- Measurement of actual load distributions and tensile forces in field applications using accelerometers and load cells

### Manufacturing technologies

- Climate chamber and testing laboratories for process tests
- Spray coating system for the thermal coating of geometries and materials
- Adhesive and coating laboratory für the application of alternative materials and joining processes in the agricultural and food industry

## Contact

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Moritz Schröder  
Techn. Coordination Agricultural  
Technology  
Tel. +49 381 49682-177  
moritz.schroeder@igp.fraunhofer.de

Fraunhofer IGP  
Albert-Einstein-Str. 30  
18059 Rostock  
www.igp.fraunhofer.de

Fraunhofer IGP in Rostock

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Agricultural Technology



## Smart Agriculture

The Fraunhofer Institute for Large Structures in Production Engineering IGP focuses its research in the field of agricultural engineering on developing high-performance technical solutions for smart agriculture. The emphasis is on automation, robotics, lightweight construction, and the use of appropriate sensor technology and artificial intelligence. On the one hand, the capabilities of traditional agricultural technology are combined with modern automation solutions; on the other hand, customized solutions are developed and implemented for specific applications.

# Agricultural Technology

## Research for Sustainable Agriculture

At Fraunhofer IGP, we develop agricultural technology that brings the strengths of modern production technology to fields and farms. Our goal is to make agricultural processes more reliable, more environmentally friendly, and more economical—and thereby make a concrete contribution to future food security.

### Our solutions

We develop solutions for crop and livestock production through mechanical engineering, automation, robotics, and digital systems. These include harvesting and handling systems for specialty crops such as berries or vegetables, intelligent methods for field crops, and data-driven assistance systems. They facilitate decision-making, optimize work processes, and provide support despite the shortage of skilled workers. In livestock farming, we create reproducible processes to reduce labor costs, promote animal welfare, and ensure product quality.

### Quality assurance

A key focus is on quality assurance and the evaluation of new technologies. We assess crop production processes for stability, product quality, and cost-effectiveness. Field trials at our Tellow innovation farm measure traction requirements, diesel consumption, and deployment strategies. Mobile robotics and drones provide additional data on crop stands and workflows to test autonomous technology under real-world conditions. These findings inform the optimization of cultivation and harvesting strategies as well as the further development of energy-efficient agricultural machinery.

### Digitalization

Digital tools play a central role in this process: Using sensors, satellite data, connected machinery, and autonomous or semi-autonomous systems, we gather comprehensive information on crop stands, soils, workflows, and livestock management. From this data, we develop key performance indicators and decision-making tools that help target the use of resources more effectively, reduce risks, and develop new, resilient business models.

At Fraunhofer IGP, we lay the groundwork for quickly putting innovative solutions into practice—for a modern agriculture that is economically viable, ecologically balanced, and socially accepted.

### Sites and Partner Farms

- Site for Agricultural Technology and Field Trials Kritzkow
- Thünen Innovation Farm Tellow
- Papendorfer Agrargenossenschaft
- Gut Brook
- Gut Hohen Luckow
- Hof Lüttow

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