

A company use case for Drones in Agricultural Contexts

Design an agricultural drone with new applications to explore the use and system-integration of drones in a agricultural context by the company CLAAS.

1. Farmers and autonomy

Several barriers hinder the adoption of new agricultural technologies. One major challenge is the lack of knowledge, awareness, and technical skills, along with inconsistent information across channels. Social factors also play a role, as there is often low engagement and limited interest among individuals.

In addition, insufficient public financial support, restrictive regulations, and unclear industry standards slow down implementation. Economic factors further intensify these challenges: weak incentives, high production costs, and consumer reluctance to pay premium prices make innovation less appealing.

Moreover, the complexity of implementation, lack of technical assistance, and large investment requirements pose practical obstacles. Finally, risk aversion, resistance to change, and low trust—combined with a focus on short-term gains—further reinforce hesitation toward adopting new solutions.

2. Proposal

The drone concept can be viewed as a relatively low-threshold entry point into drone systems, offering multifunctional capabilities.

By being deployed across different farms, it could encourage broader technology adoption and support the further advancement of drone technology through modular add-ons.

3. Desirability of Logistic support in an agricultural environment

Model	Scenario low occurrence (0.5x)	Scenario base occurrence (1x)	Scenario base occurrence (2x)
Model 1- Small farm private	salary saved 176.2 € time saved 3.53 h	salary saved 449.2 € time saved 9.00 h	salary saved 903.3 € time saved 18.08 h
Model 2- Average Farm	salary saved 1 471 € time saved 29.42 h	salary saved 2 939.5 € time saved 58.79 h	salary saved 5 878 € time saved 117.56 h
Model 3- Big farm organization	salary saved 905.5 € time saved 18.09 h	salary saved 2 210.5 € time saved 44.19 h	salary saved 3 261 € time saved 65.21 h

Fig.3 Money and time savings for different farm models

4. Feasibility of semi automatic cargo locking mechanism

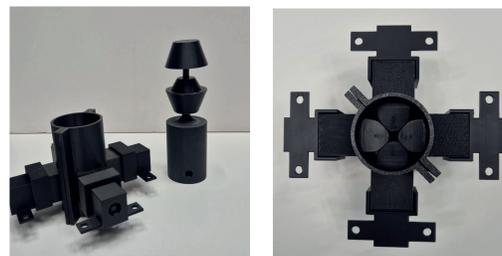
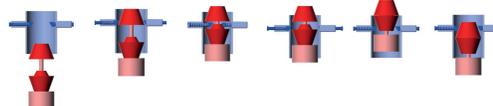


Fig.2 Latch prototype and overall functionality



There was no existing mechanism on the market that met the requirements for securely holding the intended cargo. Through initial prototypes, it was demonstrated that the mechanism fulfills its basic function, but further refinement is needed regarding surface friction and angular alignment.

For the electronic hardware and rotor setup, the DJI M400 platform was used as a reference, making the overall structural concept technically feasible. An additional purchased latch component can be integrated into the existing system. A key design goal was to visually reference CLAAS machinery to create a clear brand connection, which necessitates that most components be custom-produced.

Ongoing logistics initiatives could connect to CLAAS for a broader system network. This concept serves as a foundation for further technical and strategic development. Integration into CLAAS Connect remains challenging. Currently, drones are mainly used for plant recognition and deer rescue—applications that could be expanded through new attachments. Autonomous flight still faces strict certification, required supervision, and limited public acceptance due to political sensitivities around drone use.

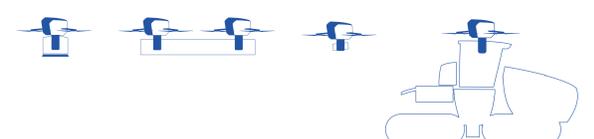
5. Viability of drones for the company CLAAS



Fig.4 Benchmarking of CLAAS drone

Even though drones may not currently appear viable for CLAAS, positioning the company as a service provider could enable strategic expansion toward automation and future integration with their tractor systems—potentially even allowing physical connection between drone and machine. At present, no concrete strategic steps for drone deployment have been defined.

By viewing themselves as data users, CLAAS could use this drone as a low-tech entry point before customers transition to more advanced, data-driven applications. The drone could serve as a valuable tool for collecting insights related to after-sales service and machine care—helping to understand what happens to equipment once it enters the field.



6. Future recommendations

The attachment could contain different components while recognizing them within the closing mechanism, though the connection system still needs refinement. Multiple drones could be combined to carry heavier loads, and a motorized grabber could enable transport of various item sizes.

Both the drone and cargo could feature attachment points compatible with CLAAS machines, and a downward-force release could enable hands-free operation.