

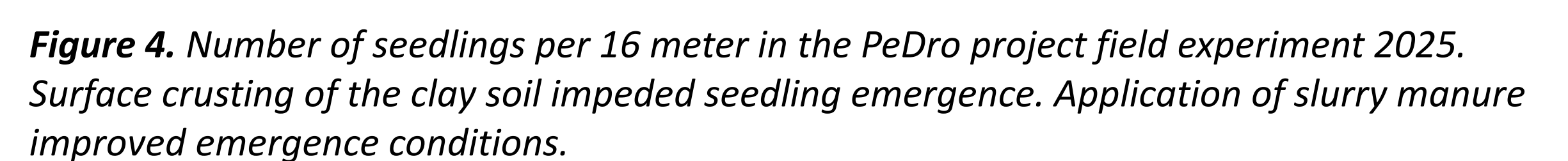
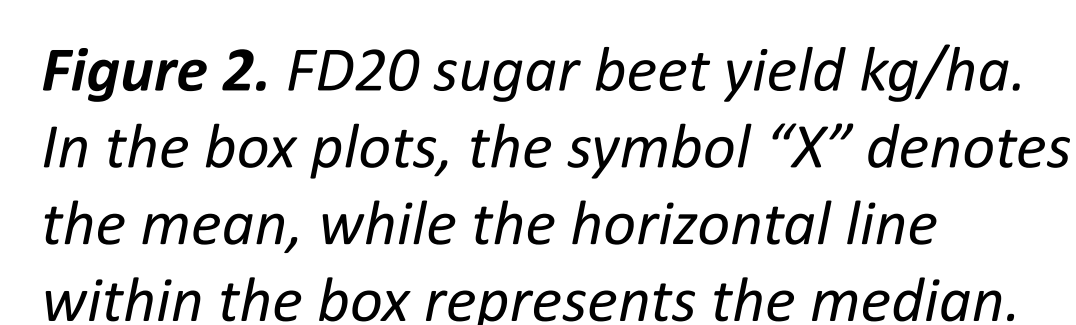


In the PeDro project (16 April 2025–31 December 2026) robotic sowing, mechanical weeding, precision fertilization, drone applications, spraying technology for field robots, and boom irrigation systems are being tested. The objective is to develop exemplary solutions for utilizing new technologies in an economically sustainable manner. The project has tested the FarmDroid field robot, the DJI Agras T-50 drone, AgXeed robotic tractor, and Irtec's boom irrigation system. The irrigation system has a working width of 50 meters and includes a Raindancer control and monitoring system utilizing geospatial data.

Part of the FarmDroid experimental plots was fertilized prior to sowing by broadcast application using a surface spreader. Mineral fertilizer (NPKS 23-3-8-3) was applied at approximately 520 kg/ha. Cattle slurry was applied to designated bands at a rate of 35 m³/ha. As a supplementary fertilization, Nitrabor was applied at 200 kg/ha by surface broadcasting on 23 June 2025 across the entire FarmDroid trial area.

Figure 1. Layout map of the PeDro cultivation method experiment.

Figure 2 presents the yield results of the FD20 plot trial. The results may have been influenced by the slower availability of nitrogen from slurry compared to mineral fertilizers. Additionally, some nitrogen losses may have occurred due to volatilization. Nevertheless, no statistically significant differences were observed in root yield or sugar content between plots fertilized with slurry and those fertilized with mineral fertilizers.



- 1. Testing of the FarmDroid FD20 Field Robot**
 - Implementation and evaluation of mechanical and chemical crop protection methods using the FarmDroid FD20 field robot.
 - Assessment of the robot's operational performance and suitability for practical farming conditions.
- 2. Testing Fertilization Methods Suitable for Field Robots and Drones**
 - Comparison of mineral and organic fertilization methods for application with field robots and drones.
 - Evaluation of the effectiveness, practicality, and suitability of different fertilization approaches.
- 3. Utilization of Drones in Precision Farming**
 - Investigation of the use of drones in practical agricultural operations.
 - Testing of drone applications in crop monitoring, fertilization, and sowing.
- 4. Pilot Testing of the FD20 Field Robot's Precision Sprayer for Weed Control**
 - Evaluation of precision spraying technology for weed management.
 - Comparison between weed control achieved with the FD20 field robot and a conventional tractor-mounted sprayer.
- 5. Operational Workflows and Economic Assessment of Drones and Field Robots**
 - Analysis of operational work chains involving drones and field robots.
 - Development of cost-effective and scalable operating models for the adoption of autonomous technologies in agriculture.
 - Assessment of economic feasibility and potential benefits for farm operations.

