| **Name and surname:** | **Katarzyna Pentoś** |
|---|---|
| Academic Degree | dr hab. inż. (DSc.) |
| Institute/Department | Institute of Agricultural Engineering |
| e-mail address: | katarzyna.pentos@upwr.edu.pl |
| ORCID: | 0000-0002-0666-1948 |
| UPWr Base of Knowledge - link | https://bazawiedzy.upwr.edu.pl/info.seam?id=UPWr0735d615d6124b7b9c2b20c37de50c90&affil=&lang=pl |
| Researchgate: | https://www.researchgate.net/profile/Katarzyna_Pentos |
| Personal website / Working group website: | - |
| Projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)): | - |
| **Research topic and funding** | |
| 1) PhD topic: | The prediction of energy consumption during soil cultivation based on scanning methods |
| 2) Research discipline in Doctoral School | Agriculture and Horticulture |
| 3) Short description of the research problem to be solved in the PhD: | Research problem: is it possible to forecast traction properties of agricultural tractor and thus energy expenditure needed for cultivation and energy losses based on the soil scanning method.<br>The tractor's traction properties depend, among others, on the type and condition of the soil. They also result from the resistance of the tool, which is also influenced by the type and condition of the soil described by such parameters as: granulometric composition, humidity, bulk density, compactness or maximum shear stress. To optimize the work conditions of the tractor aggregate on soils with a various parameters, it is required to select the tractor type so that it can work with the possible low losses resulting from the wheels slip. Based on the subject literature, it is possible to determine the tractor's traction properties knowing such soil mechanical parameters as compactness or shear stress. However, their measurement is very time and workconsuming. Therefore, it seems reasonable to find a relationship between the results of soil scanning (based on soil conductivity and magnetic susceptibility) and its physical and mechanical properties. Due to the fact that the scanning method is quick and simple to perform, based on it, one can estimate the tractor traction properties and optimize losses occurring in the tire - soil system. |
| 4) Professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques): | Master of Science (MSc.) in the field of agriculture; the knowledge of software for mathematical modeling and simulations (e.g. Matlab, R studio, Statistica, Labview); English skills certificate - minimum B2; the knowledge of construction and principles of operation of agricultural machinery; the knowledge of artificial intelligence method for data and image analysis; the knowledge of precision agriculture technology, an experience in scientific results presentation (e.g. conference papers or presentations). |
| 5) Details of the project to support PhD research | |
| a) Project title: | 0 |
| b) Agreement number: | 0 |
| c) Number of months in the project to support PhD (in months; starting from 1st of October 2021): | 0 |
| 6) Project webside: | |