Project title: Determination of Yield Forecasting Methods for some Strategic Crops

Research Area	Soil Water Resources and Environment
Research Program	Agricultural informatics
Executive Institute	Soil, Fertilizer and Water Resources Central Research Institute
Supporting Institute/s	General Directorate of Agricultural Research and Policy
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Research Period	01.01.2023- 31.12.2027

Project Summary:

Fluctuations occur in the amount of agricultural production due to rapid population growth and consequently food requirement, climate change or natural cyclical effects of climate. In terms of agricultural planning and food safety, it is important to know the amount of agricultural production correctly before harvest.

Many studies on yield estimation and yield have been carried out both in our country and around the world. Since these studies are not repeated every year and remain only regional, the results could not reach their goal. It is very difficult to make a yield estimation with satellite images throughout the country, especially for plants that can grow everywhere, such as wheat. Technologies such as artificial intelligence, machine learning and deep learning, which have been used together with big data in recent years, make it possible to predict yields from satellite images across the country.

Crop yield varies considerably both within and among parcels due to farmer practices, variety differences, environmental effects, topography, climatic effects, and differences in soil properties. Considering all these factors affecting yield, yield estimation models will be tried to be created for each region and product.

Within the scope of the project, yield estimation will be made for important agricultural products in Ankara, İzmir, Kırklareli and Batman in the first year on a district basis, then throughout the province and as the final target, nationwide. By using climate data, yield estimation will be made before harvest by agrometeological methods and crop monitoring studies will be carried out with the help of medium resolution satellite images. The yield values of the parcels will be determined by using crop index data obtained from satellite images, soil maps, previously made parcel yield values and digital data. It will be classified with different classification methods using satellite images, location information collected from the field and Farmer Registration System data. Yield estimation will be made using the yield values and crop area information to be obtained on the basis of parcels.

With the project, a sustainable and reliable yield estimation infrastructure will be established for the whole country.

Key words: Yield, yield estimation, remote sensing, GIS