Abstract

Forecasting the Population Development of within-Season Insect Crop Pests in Sub-Saharan Africa: The Pest Risk Information Service

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Smallholder farmers are the mainstay of the agricultural economies of sub-Saharan Africa (SSA), where they produce several crops, predominantly centered on maize. Smallholder productivity remains limited resulting from a range of confounding factors, but a primary cause is loss from pests and diseases, particularly insects. To improve productivity, recommendations for the mitigation of crop loss globally include early-warning and management systems for in-season indigenous pests. There are many early-warning systems in temperate regions; however, such systems are poorly established in Africa. This is in part due to the need for a combination of pest modeling, data handling and dissemination infrastructure, capacity, and resource provision. While each of these components is progressing in Africa, the means to successfully deploy such systems remain limited. To bridge this, the development of the Pest Risk Information Service (PRISE) began in 2017 for farmers in SSA. Implemented in Kenya, Ghana, Malawi, and Zambia, PRISE developed temperature-driven phenology models for major maize, bean, and tomato pests. Using downscaled and processed Earth Observation data to drive the models, PRISE partnered with African national agencies to communicate pre- and in-season pest alerts that forecast the time to act against key insect pests. Alerts were designed to be integrated into country-specific Good Agricultural Practice (GAP) recommendations to provide a complementary package to agricultural stakeholders. End line studies with farmers showed that those who received information about the target crops including PRISE pest forecasts, generally reported better outcomes in terms of reduced losses and increased incomes compared with farmers who did not**.**

Keyword; forecasting, insect crop pest, sub-Saharan Africa, modeling, Earth Observation