

AGRI 321_(ELECTIVE-IV) CROP SIMULATION MODELS

Credit hours (2+1=3)

Objective(s)

To imparting knowledge of growth, development and yield analysis, To develop crop growth model for yield prediction.

UNIT I

Photosynthesis, Respiration and photorespiration, Nitrogen metabolism, Solute transport and photoassimilate translocation: uptake, transport and translocation of water, ions, solutes and macromolecules from soil, through cells, across membranes, through xylem and phloem; transpiration; mechanisms of loading and unloading of photoassimilates

UNIT II

Principles of crop production; Evaluation of crop responses to weather element; impacts of natural and induced variability of climate on crop production

UNIT III

Empirical and statistical crop weather models, their application with examples, regression model incorporating weather, soil, plant and other environmental related parameters and remote sensing inputs; growth and yield production models

UNIT IV

Crop Simulation models, e.g., CERES, WOFOST, InfoCrop, SPAW

UNIT V

Verification, Calibration and Validation of models

Reference Book(s):

1. Principles of Agricultural Meteorology – by Bisnoi O. P. (2007). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi
2. Simulation of Water Use, Nitrogen Nutrition and Growth of a Spring Wheat Crop. Simulation Monographs, PUDOC, Wageningen
3. Agro-meteorological Crop Monitoring and Forecasting – by Frere, M. and Popav, G. (1979) FAO.

Practical(s):

Working with statistical and simulation model, DSSAT model, WOFOST, SPAW, InfoCrop