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# Simulation and Crop Modelling

**LECTURE 11**



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# 11.1 Introduction

- A simulation is the manipulation of a model in such a way that it operates on time or space to compress it, thus enabling one to perceive the interactions that would not otherwise be apparent because of their separation in time or space.
- A model is a schematic representation of the conception of a system or an act of mimicry or a set of equations, which represents the behavior of a system.



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## 11.2 TYPES OF MODELS

- Statistical models
- Mechanistic models
- Deterministic models
- Stochastic models
- Dynamic models
- Static models
- Simulation models



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# 11.3 Model Development

- **Model Calibration**
- **Model Validation**



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# 11.4 Steps of Modelling Process

- **Analyze the problem**
- **Formulate a model**
- **Solve the model**
- **Verify and interpret the model's solution**
- **Report on the model**
- **Maintain the model**



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# 11.5 Modelling in Agricultural Systems

- Complexity of agricultural systems
- Models in agriculture



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## 11.6 Principles of Successful simulation

- Simplicity
- Learn from the past
- Create a conceptual model
- Build a prototype
- Push the user's desire
- Model to data available
- Separate data from software



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## 11.7 Model Uses

- Crop system management: to evaluate optimum management production for cultural practice.
- Helps in evaluating weather risk.
- Investment decisions become qualitative
- These are resource conserving tools





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## 11.8 Model Limitations

- Models and simulations can't ever completely re-create real life situations
- Not every possible situation have been included in the model
- The equipment and software are expensive to purchase
- The result depends on how good the model is and how much data was used to create it in the first place



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**THANK YOU**