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(OptALI)

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Ongoing Deliverable D1.2

Description of Research Seminar: Supply Planning for the Material Use of Renewable Resources

Start date of the Workpackage:	December 2010
Duration:	48 months
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Participants:	UGOE UNIKL DTU UOA UC
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Research Seminar

offered by Susanne Wiedenmann (ES-UGOE1)

in January 2011,

in Auckland, New Zealand

Subject: Supply Planning for the Material Use of Renewable Resources

Problem: To model the problem of uncertain quality and quantity, that confronts processors of agricultural goods, information about the structure of the uncertainties is required. Different approaches and modelling techniques fit the respective information structures. We use a two stage stochastic program to model the supply planning of a processor of agricultural products, that is exposed to seasonal supply with uncertain quality and quantity. He can hedge against shortages with optional supply, that certainly fulfills quality requirements and for which in any case a risk premium has to be paid. If the final product fulfills quality requirements, it is sold for a fixed price to an industrial customer, with whom a long term contract is established. Surplus production and product with unsatisfactory quality is sold for an uncertain price on the commodity market. The processor aims for profit maximization. A penalty has to be paid, if the demand of the industrial customer is not satisfied. We evaluate the model with real world data for linseed and linseed oil. The approach of robust optimization and online optimization is considered as well.

Main Results: We have modeled this situation with stochastic programming and tested the model with real world data for linseed and linseed oil. The model depicts the complex decision situation and shows the correlation between uncertainties and profit. The decision maker can adapt the model parameters to his own situation and get valuable information to support his decision. Basically this model can be used for processors of other agricultural goods as well.

We are still in the process of investigating approaches of robust and online optimization.

Participants: Students and researchers from UOA, Sven Krumke (UNIKL), Jutta Geldermann (UGOE).

Publication (if any): Supply Planning for the Material Use of Renewable Resources (submitted December 2011)