

SPEAKER PRESENTATIONS

POST-HARVEST STAND DEVELOPMENT CONFERENCE

KEYNOTE ADDRESS: A GROWTH AND YIELD PERSPECTIVE

DR. HAROLD BURKHART, VIRGINIA TECH

This session will provide an overview of developing growth and yield models for managed stands. The emphasis will be on installing and maintaining long-term field studies and on incorporating data from a host of sources for calibrating reliable stand simulators that allow for a wide range of silvicultural and utilization options.

KEYNOTE ADDRESS: A FOREST GENETICS PERSPECTIVE

ALVIN YANCHUK, BRITISH COLUMBIA MINISTRY OF FORESTS

Alvin will cover three main topics which will address some of the main questions the conference is covering; 1) the choice of genetic materials, and how to best plant them, 2) the development of a system that evaluates genetic quality of material going onto the landscape, and 3) how this 'evaluation system' is currently being incorporated into a growth and yield application tool in B.C. The development of this integrated system into B.C. forest policy will be discussed.

GROWTH AND YIELD MODELING

WHOLE STAND MODELS

SHONGMING HUANG, ALBERTA SUSTAINABLE RESOURCE DEVELOPMENT

This session will discuss current development highlights of a stand level Growth and Yield Project System (GYPSY), along with other modelling issues, priorities and challenges facing Alberta today.

INDIVIDUAL TREE MODELS

PHIL COMEAU AND KEN STADT, UNIVERSITY OF ALBERTA

This session will review some important characteristics, benefits and limitations of individual treedistance-independent models (which include the Forest Vegetation Simulator (Prognosis), the Mixedwood Growth Model (MGM), and others) and will present some ideas on modeling effects of establishment and early tending practices on early development of trees. Results from some recent work comparing spatial vs. non-spatial competition models will be presented. The session will also discuss several issues relating to modeling of the effects of site preparation, establishment, breeding and early tending on stand development.

INDIVIDUAL TREE SPATIAL MODELS

IAN CAMERON, AZURA FORMETRICS

This presentation describes the experience acquired by a modeling team in the development, calibration, testing, and application of the Tree And Stand Simulator (TASS)—a spatially explicit, individual-tree, growth and yield model.

As the terminology implies, TASS simulates the growth of individual trees with respect to their spatial position in a three-dimensional grid. The simulated trees interact through the competition of crowns for growing space. TASS simulates a wide variety of silvicultural treatments. Furthermore yields can be expressed as conventional tree dimensions (i.e., height, DBH, volume) or products (assortments and grades of logs, lumber and chips). TASS also reports descriptors of stand structure that have become increasingly useful in analyzing the impact of silvicultural treatments on habitat capability and biodiversity indicators.

This Conference is a Collaborative Initiative of the Foothills Growth & Yield Association, Foothills Model Forest, and Alberta Forest Genetic Resources Council

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The presentation provides an overview of the architecture of the current operational version (TASS II); summarizes the modifications underway in the development of TASS III; describes how the model has been adapted over time to address new forest management issues; and provides examples of how the TASS has been tested or validated. The presentation also speaks to and provides examples of the most common applications of the model.

RESEARCH STRATEGIES FOR PROCESS-BASED MODELS IN FORESTRY

DAVE COATES, BRITISH COLUMBIA MINISTRY OF FOREST

Forest management practices across boreal Canada are in a period of transition in response to variable factors: new ecological research, social pressures, climate change. Growth and yield researchers must strive to find ways to produce models that can accommodate greater complexity and uncertainty. Traditional single-species growth and yield models are increasingly unable to address emerging questions in forestry. The session will outline research methods that can be used to parameterize process or hybrid models that may be more flexible for predicting tree growth in complex stands or as climate changes.

INTEGRATING DISCIPLINES: CONCURRENT SESSIONS

NOTE: Please refer to the Conference Program for the schedule of concurrent sessions

SILVICULTURE: GROWTH AND YIELD PROTOCOLS FOR HYBRID POPLAR PLANTATIONS AT ALBERTA-PACIFIC

BARB THOMAS, ALBERTA-PACIFIC FOREST INDUSTRIES INC.

Barb will cover the extent and expansion of the intensively managed poplar farm program at Alberta-Pacific Forest Industries Inc. (Al-Pac) and describe the protocols designed to obtain growth and yield measurements. The current formula being used to calculate individual tree volumes will be presented as will the development of a new formula based on whole tree measurements. Challenges faced in protocol development and utilization of volume outputs will also be touched on.

FOREST GENETICS: INCORPORATING GENETIC GAIN INTO GROWTH MODELS

RANDY JOHNSON, UNITED STATES FOREST SERVICE

Randy will provide background on the different methods used to incorporate genetic gain into growth models, and present preliminary results of a study using Douglas-fir progeny test data to incorporate genetics into regional growth models. The study examines the potential of using growth modifiers in individual tree growth models to account for genetic gain.

FOREST HEALTH: FIRE BEHAVIOUR CONSIDERATIONS

MARTY ALEXANDER, CANADIAN FOREST SERVICE

Marty will provide a overview (for the non-specialist) of relevant fire behavior terms and concepts, existing tools for predicting fire behavior at the stand level (with particular emphasis on the development and propensity for crown fire activity), and finally, to offer some suggestions for future direction. The limitations of present day fire behavior models and systems are highlighted.

SILVICULTURE: MIXEDWOOD STAND DEVELOPMENT

VIC LIEFFERS, UNIVERSITY OF ALBERTA

The paper examines the stocking, growth and mortality for white spruce in mixedwood stands, using mill-hectare plots as the sample unit. The free-to-grow (FTG) standard is examined as means to evaluate the effect of competition. The FTG standard does not isolate competition from other factors affecting tree growth.

FOREST GENETICS: PREDICTION OF GENETIC GAIN – A ROBUST GROWTH MODELLING STRATEGY

SUE CARSON, CARSON ASSOCIATES LTD.

Genetic gain in growth can be modelled as an increase in growth rate (separately for diameter and height). This approach requires existing growth models (which accurately predict the effects of stand density and site quality) and breeding values of planting stock. By utilising data from large-block genetic gain trials, the approach allows accurate prediction of performance of seedlots and silvicultures which are not represented in genetic gain trials, thus providing a robust solution to prediction of growth of genetically improved forests.

FOREST HEALTH: PATHOLOGICAL CONSIDERATIONS IN GROWTH AND YIELD

PETER BLENIS, UNIVERSITY OF ALBERTA

Integrating loss from pathogens into growth and yield modelling requires an understanding of the unique features of the individual pathogens. The salient characteristics of decays, dwarf misteltoes, armillaria root disease and rusts will be examined in the context of growth and yield modelling. The role of risk assessment in modelling of intensively managed poplar plantations will be considered.

FOREST HEALTH: INTEGRATING SPRUCE BUDWORM INTO GROWTH AND YIELD MODELS

DAVE MCLEAN, UNIVERSITY OF NEW BRUNSWICK

When spruce budworm defoliates trees, removal of the tree's 'photosynthetic factory' initially reduces growth rates, and if severe and prolonged over several years, trees die. Thus, the key to integrating spruce budworm into growth and yield models is relationships linking tree growth rate to defoliation level and mortality rate to defoliation. This gets complicated by differential relationships (growth or mortality response) as a function of different tree species, age, site conditions, hardwood content in stands, surrounding landscape composition, and temporal pattern of defoliation. Incorporation of these relationships into the Spruce Budworm Decision Support System and its usage in planning insecticide programs and alternative harvest scheduling/salvage will be described.

SILVICULTURE: LONG-TERM EFFECTS OF DENSITY REGULATION ON CONIFER GROWTH AND YIELD – RESULTS FROM TWO NEW BRUNSWICK STUDIES

DOUG PITT, CANADIAN FOREST SERVICE

The *Green River Spacing Trials*, established by Dr. Gordon Baskerville in 1959-61, now offer more than 40 years of growth response data with which to weigh the costs and benefits of precommercial thinning. Two *J.D Irving Limited* trials, established in 19- and 24- year-old white spruce plantations in 1984, compare the outcomes of single-, delayed-, and double-entry commercial thinning. Together, these studies provide long-term managed-stand data that can contribute to the "logical extrapolation" of our growth and yield forecasts.

SILVICULTURE: ALBERTA FRAMEWORK LINKING REGENERATION TO GROWTH AND YIELD

KEN GREENWAY, ALBERTA SUSTAINABLE RESOURCE DEVELOPMENT
RICHARD BRIAND, WEST FRASER MILLS LTD.

Alberta has embarked on a process of developing regeneration standards that are linked to Detailed Forest Management Plan assumptions and goals. Forest Management Agreement (FMA) holders are required to develop new, yield-linked standards that will replace the provincial reforestation standards by 2010. Alberta Sustainable Resource Development has provided the goals and objective for these Alternative Reforestation Standards (ARS), but FMA holders are leading the development through a focused effort to utilize data, models and expertise to derive and substantiate the standards. Representatives from Alberta Sustainable Resource Development and West Fraser Mills will overview the process of ARS development and provide insights on how ARS development is rapidly moving reforestation standards in Alberta to a new level of sophistication.

**FOREST HEALTH: A RISK ASSESSMENT FRAMEWORK FOR DISTURBANCE TO
INTENSIVELY MANAGED STAND**

JAN VOLNEY, CANADIAN FOREST SERVICE

A general framework to capture the effects of multiple disturbance effects on stand development is described. Examples including the effects of drought, fire, and pests on stand development are given to illustrate its application in forecasting yields. A discussion of policy applications and further development needs conclude the presentation.