



timberlines

Forestry Canada, Northwest Region

January 1991



C. Ogilvie

Flying in a helicopter 400 m over this prescribed burn near Timmins, Ontario, kept Forestry Canada, Northwest Region, employee Chuck Ogilvie alert in the summer of 1990. Please see the article on page 2.

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Taking fire photos no vacation

Dangling in a helicopter 2500 m above a capricious vortex of searing heat, flame, and smoke is enough to make anyone think twice about a new line of work. But Chuck Ogilvie, if not exactly at ease in such a situation, has at least been there before.

Mr. Ogilvie, a fire research technician at the Northern Forestry Centre, returned to northern Ontario in the summer of 1990 to continue his work on a major Canada-U.S. fire behavior study. As in the previous 2 years, Mr. Ogilvie was evaluating the performance of an infrared camera system. The two operational prescribed burn sites chosen this year were located near Manitouwadge (on the north shore of Lake Superior) and south of Timmins.

The study has been spearheaded by Forestry Canada's Great Lakes Forestry Centre in Sault Ste. Marie, Ontario.

Cooperators include Environment Canada's Atmospheric Environment Service, the Ontario Ministry of the Environment, the Ontario Ministry of Natural Resources, the U.S. Forest Service, the North American Space Administration, and the U.S. National Oceanic and Atmospheric Administration. The American agencies' interest in the study is related to the carbon dioxide released by forest fires and how that affects global warming.

The infrared camera was housed in a pod slung from the belly of a Bell 206 helicopter and is an adaptation of the large-scale photo (LSP) camera system developed by Ron Hall, a remote sensing researcher at the Northern Forestry Centre. The Manitouwadge and Timmins sites were chosen for the uniformity of their fuels, as it was

felt such uniformity would contribute to more accurate predictions of fire spread rates. In addition to providing additional data on fire behavior resulting from circular patterns of drip-torch ignition, the infrared camera also recorded the time at which the fire reached sensing devices and how long and how intensely it burned at each sensor.

Although at the mercy of the elements to some degree, research such as Mr. Ogilvie's is founded on a carefully defined experimental design. Supporting the infrared camera work this year was a project

carried out by Marty Siltanen, a land classification technician with the Northern Forestry Centre. Flying about 85 m above the ground, Mr. Siltanen employed the LSP system to take pictures of



This aerial color transparency of harvesting debris taken south of Timmins, Ontario, in the summer of 1990 is being used to calculate amounts of fire fuel on the ground. The 1:500 scale images will be digitized and the results compared with those obtained by counting the stems on the photo and by field measurements.

harvesting debris as part of a study to calculate amounts of flammable material on the ground. He tested a new high-speed aerial color transparency film that permits photographs to be taken under less than ideal conditions, resulting in fine-grained pictures showing good detail at a 1:500 scale.

As Mr. Ogilvie analyzes the data and images he collected last summer, he will no doubt relive some of the pulse-racing immediacy of his experience. The Canada-U.S. fire behavior study is scheduled to run one more year. Regarding the harvesting debris study, Mr. Hall anticipates that those photos will be digitized for further analysis, in addition to being compared to traditional photogrammetric methods and field measurements.

—A. Ascher



Researcher Yasu Hiratsuka.

Researcher awarded NSERC grant

Tree diseases researcher Yasu Hiratsuka of the Northern Forestry Centre has been awarded a grant of \$385,500 by the Natural Sciences and Engineering Research Council of Canada (NSERC).

The funds of \$127,500 in November 1990, \$127,500 in November 1991, and \$130,500 in November 1992 are for microbial and chemical investigations of decay and stain in relation to aspen resource utilization in the prairie provinces. Bill Ayer and Lynne Sigler of the University of Alberta are cooperators in the study.

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Expert Review Panel on Forest Management recommends more public input to Alberta forestry

More public input and involvement in dispositions of forest management areas and in development of forest management plans—that is just one of over 130 recommendations contained in the final report of the Expert Review Panel on Forest Management in Alberta.

Appointed by Alberta's forestry minister, LeRoy Fjordbotten, in March of 1989, the panel was mandated to gather public opinion and formulate recommendations on a wide array of forest management issues. The panel submitted its report in May 1990, and the report was publicly released in July.

Public hearings into Alberta-Pacific Forest Industries' proposed bleached kraft pulp mill near Athabasca, Alberta, cornered provincial news coverage in late 1989 and through the first half of 1990. While the Al-Pac hearings centered on the environmental impacts of pulp mill effluent, they did not address harvesting or other forest management practices. The Expert Review Panel

was appointed to address the latter issues.

The panel consisted of four members: Lorne Brace, a research manager at the Northern Forestry Centre; Bruce Dancik, Chairman of the Department of Forest Science at the University of Alberta, who chaired the panel; John Stelfox, a wildlife research scientist formerly with the Canadian Wildlife Service; and Bob Udell, a professional forester in charge of forest planning for Weldwood Canada at Hinton. The panel members based their report on input from a series of information sessions, open houses, and public meetings held in over 40 communities, supplemented by their own professional experience.

The report suggests significant staffing increases are warranted for Alberta Forestry, Lands and Wildlife and recommends formation of a new Department of Natural Resources from provincial departments that have a role in managing public lands. In keeping with the principle of sustainable development, the

report recommends that the government complete its Alberta Conservation Strategy, particularly as it relates to the forest sector. To smooth the way for integrated resource management that includes public input at the planning stages, two levels of forest management advisory boards are recommended.

The report further singles out the current point-source environmental impact assessment process used to evaluate pulp mill facilities as inappropriate to deal with the environmental impacts of forest management activities associated with mill development. It suggests such impacts could be dealt with more effectively by clarifying the ground rules for forest industry development and by having the Environment Council of Alberta conduct periodic audits of forest management.

Forest research also gets some attention. In addition to more aggressive funding of research, the following are recommended: development and use of specific yield tables for regenerated stands and incorporation of site-related information into planning tools; development of a policy to designate and manage old-growth forest ecosystems; and integration of harvesting and silvicultural operations.

Finally, the report acknowledges the problem of retaining adequate conifer stocking levels in reforested areas. It suggests that a policy and regulations addressing the critical issue of vegetation management be developed, supported by adequate cost-effectiveness and research and development studies into alternative methods, including herbicides. Many research projects under way or completed by Forestry Canada, Northwest Region, staff address precisely the above-noted research issues.

Media interest following public release of the report was intense, but Mr. Brace handled interviews deftly with his usual composure.

—A. Ascher

Forestry Minister in Winnipeg



Forestry Minister Frank Oberle (right) accepts a plaque of membership in the Canadian Interagency Fire Centre during his visit to Winnipeg on November 15, 1990. Presenting the plaque is Allan Jeffrey, Director of the Fire Centre, which is funded by the federal and provincial governments.

M. Grandmaison

Forestry Canada a key player in federal Green Plan

Forestry Canada has a major role to play in the Government of Canada's Green Plan for a healthy environment announced in December 1990. The forestry component consists of two main programs: Partnerships for Sustainable Forestry and National Community Tree Planting. In addition, there are implications for forestry in many other Green Plan programs.

Model forests are a highlight

of the Partnerships for Sustainable Forestry Program. In partnership with provincial governments and the forest industry, the federal government will encourage the creation of up to eight forestry demonstration projects as working models of sustainable development.

Also under the Sustainable Forestry program there will be enhanced research to better understand the impacts of forestry



practices on the forest ecosystem, more environmentally acceptable strategies for pest and vegetation control, more relevant and timely information about the state of the forest resource, and initiatives to protect forest diversity.

The National Community Tree Planting Program will support the planting of up to 325 million trees over 5 years in rural areas and in and around the 6000 cities, towns, and communities of Canada starting in 1991. The program will promote voluntarism and will encourage activities by individuals, organizations, communities, companies, and provinces to take action on the environment through planting trees.

Details of these programs and the implications for Forestry Canada's Northwest Region will be announced as they are developed and funds allocated.

Scientists testify at ERCB hearing

In one corner: Husky Oil Operations Ltd. In the other: Shell Canada Ltd. The venue: the Kurt Browning Arena in Caroline, 110 km northwest of Calgary in May 1990. At stake: the rights to develop an enormous sour gas field to extract natural gas.

There was high drama indeed at the Alberta Energy Resources Conservation Board (ERCB) hearing in Caroline. Husky was proposing to expand its existing sour gas processing facility in the Ram River area, 40 km west of Caroline. Shell was proposing to build a new plant. It happened that the testimony of two Northern Forestry Centre research scientists, Doug Maynard and Ken Mallett, proved valuable to the standing-room-only proceedings. Husky had asked Dr. Maynard and Dr. Mallett to testify, not on its behalf but as impartial expert witnesses, on the health of the forest surrounding Husky's Ram River plant.

The two researchers' testimony followed a submission by Thomas Bouman, a German consultant acting on behalf of one of the intervenors. Mr. Bouman had suggested, after a 2-day tour in March 1990 of areas downwind from the gas plant, that lodgepole pine trees were suffering stress due to acid rain.

Dr. Maynard's and Dr. Mallett's testimony contrasted sharply with the pronouncements made by Mr. Bouman. Forestry

Canada is no stranger to the area, having begun insect and disease studies there in the early 1950s. More recently, a 5-year study directed by Dr. Maynard found no measurable effects on the lodgepole pine trees downwind of the Ram River plant due to sulfur dioxide emissions. The study did find that sulfur dust being stored near the plant was causing some damage to the forest within a 1-km radius.

Dr. Mallett and Dr. Maynard had revisited monitoring sites in the Ram River study area in April, one month after Mr. Bouman's visit. Dr. Maynard told the ERCB hearing that his examination gave him no reason to doubt his previous findings. Dr. Mallett added that the advanced age of the trees (average 110 years old), coupled with human incursions such as road and pipeline development, made the trees susceptible to naturally occurring diseases and rots already documented in the area.

The hearings crackled with spirited exchanges between the lawyers representing Shell and Husky and with emotional testimony by some of the intervenors. Dr. Maynard, in fact, was subjected to some lengthy grilling by the lawyer representing Shell, an adrenalin-charged experience that left him a little worn but basically intact. Shell was granted development rights in August 1990.

—A. Ascher

Aspen symposium drew a large crowd

Over 200 people crowded into an Edmonton hotel meeting room on November 20 and 21, 1990, to hear how aspen, Canada's most-promising new commercial tree species, can be best managed.

"The symposium on Aspen Management for the 21st Century was the first time in Canada that management and harvesting as well as nontimber uses of aspen were being discussed together at a practical level," explained symposium coordinator Stan Navratil, a silviculture researcher at the Northern Forestry Centre.

Sponsored jointly by the Poplar Council of Canada, Forestry Canada, and Alberta Forestry, Lands and Wildlife, the symposium featured over 25 invited speakers from across Canada and the United States. The symposium proceedings will be published in the early summer of 1991 and will be available from the Northern Forestry Centre.

Alberta aspen data used in FORCYTE-11 growth model

Calibration of the FORCYTE-11 forest ecosystem growth simulation model using data from Alberta aspen stands is nearing completion. It has been a mammoth undertaking on several fronts. Hamish Kimmins of the University of British Columbia and Kim Scoullar of Life Science Programming did the seminal work in developing FORCYTE under contract to Forestry Canada. The authors call FORCYTE-11 a "flexible modelling framework rather than a single model" that can be applied to a diverse range of scenarios, from tropical agroforestry to the boreal forest.

Dr. Mike Apps, a research scientist at the Northern

Forestry Centre and scientific authority for the FORCYTE-11 project, has developed a program called PROBE to run with FORCYTE-11, designed to make the latter more user-friendly. Western Ecological Services Ltd. of Victoria has been carrying out the legwork needed to take what is known about nutrient cycling in aspen and calibrate it, i.e., frame it for use with FORCYTE-11.

Furthermore, much of the

Alberta data used in the calibration process have been gathered from plots originally established under a contract administered by the Northern Forestry Centre under the Energy from the Forest (ENFOR) program. ENFOR is a federally funded program set up in the late 1970s to encourage alternative or nontraditional energy research.

Forty plots covering three age groups were set up in 1981 at Lac La Biche, Grande Centre, Calling Lake, Kinuso, and Swan Hills to provide raw data on aspen biomass and nutrient distribution in aspen ecosystems.

Teja Singh, a research scientist with the Northern For-

estry Centre, further refined these data to produce final aspen biomass figures. Dr. Singh based his work on formulas developed by Imre Bella and Joe De Franceschi. Dr. Bella is a research scientist and Mr. De Franceschi is a forest economist with the Northern Forestry Centre.

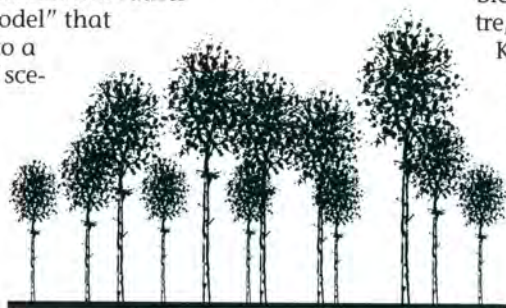
The biomass and nutrient cycling components of the Alberta ENFOR studies have been almost tailor-made for the FORCYTE

calibration work; however, the model requires data from not only three age classes, but from each of those classes on three different site types. Harjit Grewal, a forestry officer at the Northern Forestry Centre, has developed a variant of a U.S. Forest Service model (STEMS) to fill some of these data gaps. He has also used this other model to supplement literature data to provide a FORCYTE-11 calibration for mixed white spruce-aspen stands.

Aspen behaves differently, biologically speaking, from many other forest tree species. Suckering and cloning, for example, are reproductive processes differing markedly from those common to coniferous species. These biological differences have played a formative and challenging role in the calibration process. It is hoped that the model can be used to compare short- and long-term forest growth for different harvesting rates (rotation lengths) and intensities, silvicultural procedures (such as thinning, fertilizing, and competition control), and other management options (such as mixed species stands versus pure stands).

The FORCYTE-11 model and a user manual for the benchmark version are now available from Dr. Apps at the Northern Forestry Centre.

—A. Ascher



Deputy Minister visits Northern Forestry Centre

Treating himself to do what he really likes, Forestry Canada's Deputy Minister, Jean Claude Mercier, visited the Northern Forestry Centre (NoFC) in Edmonton on November 29-30, 1990.

Mr. Mercier was kept busy with a lengthy session involving scientists, project leaders, and managers, a walkabout tour of seven projects during one afternoon, and addressing a general staff meeting. A highlight of the staff meeting was the unveiling of photos of recent retirees on the Retirement Wall of Fame in the cafeteria. A number of the retirees were present to see their photos unveiled and to receive



Forestry Canada Deputy Minister Jean Claude Mercier (right) discusses site classification research with project leader Ian Corns (left), who is also Acting Forest Resources Program Director. Mr. Mercier was touring the Northern Forestry Centre during his visit in November 1990.

their own environmentally friendly NoFC 20th anniversary coffee mug from Mr. Mercier. The wall was inaugurated in the spring of 1990 by Forestry Minister Frank Oberle and is an initiative of the Northern Forestry Centre members of the Public Service Alliance of Canada.

During his time in Edmonton, Mr. Mercier also managed to meet with Cliff Smith and Ken Higginbotham of the Alberta Forest Service, Mac Millar of Millar Western Ltd., and Peter Murphy of the University of Alberta and to visit the Alberta Research Council's Forest Products Testing Lab.

Preharvest silviculture prescription: tool of the future

By understanding the properties and limitations of a given site, a forester can develop a preharvest silviculture prescription that is used to plan more cost-effective and environmentally appropriate forest management practices.

A preharvest silviculture prescription (PHSP) is essentially a planning tool incorporating many site-related factors. It is designed to be used before cut block boundaries are established. Users are to include data such as vegetation cover and soil compaction and erosion potential and to formulate recommendations on such things as method and season of logging and regeneration. Potential fish, wildlife, and recreation considerations are flagged, and the possible impacts of forestry operations on site productivity are considered.

A workshop on preharvest silviculture prescriptions was presented at the September 1990 meeting of Forestry Canada's Regional Reforestation Technical Committee. The Whitecourt meeting brought together 27 government, university, and industry foresters and researchers from Alberta, Saskatchewan, Manitoba, and the Northwest Territories.

Larry McCulloch of Laing and McCulloch Forest Management Services in Smithers, B.C., guided participants through the 2-day workshop based on the British Columbia PHSP training manual. He was assisted by Ian Corns, a research scientist with the Northern Forestry Centre, and Keith Jones of the Alberta Research Council. The workshop also included time in the field for participants to develop their own prescriptions.

Canadian Forest Products Ltd. (Canfor) in Grande Prairie and Millar Western Industries Ltd. of Whitecourt have begun to incorporate the PHSP planning process in an ongoing predictive mapping pilot project. The two companies are interested in incorporating site-related information in their geographic information systems (GIS).

In June 1990, Dr. Corns and Dr. Jones gave courses to those two companies and to Blue Ridge Lumber (1981) Ltd. of Whitecourt in

which they outlined the steps needed to incorporate site classification data more fully into the forest management planning process. The basic building blocks for including site classification data in geographic information systems are soil survey maps, topographical information, and forest inventory information, all digitized.

Canfor and Millar Western anticipated logging some parts of the predictive mapping pilot project areas in late 1990 or early 1991. In the summer of 1990, personnel from both companies used data sheets and soil augers to gather site-related information such as forest cover

types and soil properties. This information is, in fact, used in the preharvest silviculture prescription process. Canfor has, in addition, produced maps on its GIS for each proposed cut block, indicating site type and a preharvest silviculture prescription.

While PHSPs can be formulated without maps by using ground truthing, predictive site-type mapping could significantly cut down the need for that ground truthing, which is notoriously time-consuming and costly. PHSPs and predictive site-type mapping working in tandem in a GIS environment appear to offer great promise.

—A. Ascher



Jack pine budworm larvae are messy and wasteful feeders, leaving behind a tangled mass of needles and silk.

Jack pine budworm tied to drought

The extent and timing of past outbreaks of jack pine budworm in Manitoba and Saskatchewan appear to have been tied to occurrences of drought in those provinces, Jan Volney has found. Dr. Volney, a research scientist with the Northern Forestry Centre, feels this relationship can be a valuable tool in predicting future jack pine budworm outbreaks.

Although not as widespread in Manitoba and Saskatchewan as the spruce budworm is, for example, in New Brunswick, the jack pine budworm makes its mark. "This insect has a cavalier attitude toward its food," Dr. Volney explains. "It

eats some needles here, leaves others half-finished there and exhibits poor hygiene, to put it politely. The feeding webs, when dry, turn a characteristic brick red color." Jack pine budworm attacks can stress trees to the point where annual growth is negligible, and repeated assaults on older stands can decrease wood yield up to 40%. Consequences to the timber supply are unknown but studies are under way.

Dr. Volney analyzed 50 years of records collected by Forestry Canada's insect and disease survey rangers. As detailed accounts of

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Jack pine budworm

Continued from page 6

drought were not available, he used forest fire histories in the regions affected as a proxy for periods of drought. When he compared the insect outbreaks to the fire histories, two different patterns emerged. In some cases large outbreaks appeared two or three decades after bad fire seasons; in others there was a shorter lag of 4-7 years between such fire seasons and outbreak peaks. In both cases the outbreaks were tied to the timing of and an increase in jack pine flower production. Dr. Volney also found that outbreaks are generally getting larger. Stepped-up fire protection has led to less renewal of stands by fire, so more stands are aging to the point where they are increasingly susceptible to insect attacks.

Dr. Volney has developed models that can provide general predictions of the size and severity of jack pine budworm outbreaks four years in advance. These forecasts, together with annual monitoring of areas defoliated, give forest managers enough information to reschedule harvesting and complete any silvicultural treatments well ahead of an expected outbreak. In addition, information in the models can be used in projecting the effects of jack pine defoliation on timber supply in the affected region, and in planning jack pine budworm control measures.

—A. Ascher

Focus on Forests checks out "minibeasts"

Alberta students, magnifying glasses in hand, may soon be sleuthing the whereabouts of "minibeasts" in their forests. The hunt for small invertebrates such as spiders is just one of a wide array of hands-on activities contained in the Alberta *Focus on Forests* educational program under development. A pilot project introducing the program is planned for Alberta's Peace River and Calgary school districts.

Alberta's *Focus on Forests* is a curriculum package being adapted from an Ontario package of the same name. The latter was put together by Forestry Canada's Petawawa National Forestry Institute, the Ontario Ministry of Education, and the Ontario Ministry of Natural Resources under the Canada-Ontario Forest Resource Development Agreement.

The Northern Forestry Centre sponsored a visit by an Ontario consultant in May 1990 to introduce *Focus on Forests* to local interest groups. The Alberta Forestry Association subsequently organized a steering committee with representation from Forestry Canada, Alberta Education, and the Alberta Forest Service to provide direction as the package is adapted to and prepared for implementation in Alberta.

Packed with activities for students from Kindergarten through Grade 13, but geared primarily for Grades 4 through 9, the Ontario *Focus on Forests* package consists of two manuals, one for primary and

junior high levels and the other for intermediate and senior levels.

The first manual is divided into three main sections. The first section, "Discovering Trees", introduces students to basic tree physiology. "Nature's Drinking Straws", for example, shows students how trees draw water and nutrients from the soil, and "Hidden Colours of Leaves" introduces students to the pigments that emerge in autumn leaves.

The second section, "The Forest Community", reinforces the ideas of the forest as habitat and shelter and of the interdependence of its flora and fauna. The last section, "Forests in Our Lives", brings home the commercial, environmental, and recreational values of forests and uses fables such as "The Lorax" by Dr. Seuss to stress the importance of wise forest management.

The intermediate/senior manual employs a variety of role-playing and decision-making activities.

Implementation of *Focus on Forests* throughout Alberta schools is anticipated by 1992. For the many organizations involved in or associated with Alberta's forest sector, including the forest industry, the program answers an acute educational need, one that will only intensify in these environmentally conscious times.

—A. Ascher



Saskatchewan District Office Manager Vic Begrand.

New Saskatchewan District Office Manager

Victor Begrand is the new District Manager of the Forestry Canada, Northwest Region, Saskatchewan District Office in Prince Albert. Mr. Begrand joins us on a 2-year Interchange Canada Program secondment from the Saskatchewan Department of Parks and Renewable Resources, where he was Manager of Silviculture with the Forestry Branch. A native of Prince Albert, he is a forestry graduate of the University of British Columbia and has worked for both the federal government and private industry.

Staff changes

After 35 years of service with Forestry Canada and its predecessor organizations, **Ross Waldron**, Forest Resources Program Director, retired in January 1991.

Ian Corns, Project Leader, GIS, Forest Inventory, and Site, has been appointed Acting Program Director, Forest Resources. **Steve Price**, Regional Development Program Director, has accepted an 18-month assignment in Ottawa as Director of Operations commencing in February 1991.

Judy Samoil, formerly Head of Publications, has become the Regional Communications Officer. **Brenda Laishley**, formerly Scientific Editor, is now Head of Publications. **Margaret Mason** joins the Northern Forestry Centre as Scientific Editor. Also joining the Communications team are district office Communications Officers **Louise Worster** in Prince Albert and **Doug Pronger** in Winnipeg. Former Regional Communications Officer **Avery Ascher** resigned to pursue freelance writing.

Bryan Lee is the new Project Leader, Fire Management Research. Joining him as Fire Research Officers are **Kelvin Hirsch**, formerly with the Manitoba District Office, and **Bill de Groot**, formerly with the Saskatchewan District Office. Fire researcher **George Chrosciewicz** retired in December 1990.

Joni Griffin has joined the Northern Forestry Centre as Administrative Officer, to replace **Ann Fulton**, who resigned.

Susan Taylor is the new Office Administrator in the Manitoba District Office. **Bente Schlawitz** and **Betty Beaton** have both left the Manitoba District Office.

Joe De Franceschi has returned to his Forest Economist position in Edmonton from his acting assignment as Manager of the Saskatchewan District Office. **Sharon Urquhart** has resigned

from the Saskatchewan District Office.

Ivor Edwards has transferred to the Mixedwood Silviculture Project as a Soil Scientist, and **Joe Van Dyk** has also joined that project as a Soil Research Technician.

Two Remote Sensing staff have moved. **Marty Siltanen** has transferred to the Wetlands and Forest Productivity Modeling Project as a Land Classification Technician and **Andre Kruger** has joined Regional Development as a Systems Analyst



J. Johnston

As interest in farm woodlots increases in the prairie provinces, field days such as this one in the Torch River area of Saskatchewan in October 1990 will become more common. This crowd was enjoying Saskatchewan's First Annual Farm Woodlot Association Field Day. Saskatchewan District Office forestry technician Jim Johnston promoted opportunities for farm woodlot establishment under the Canada-Saskatchewan Forest Resource Development Agreement.

New publications

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Two-way ASCII file transfers between HP and IBM compatible microcomputers. For. Manage. Note 49.

Klein, J.I. 1990. Survival and growth of jack pine provenances in Manitoba. For. Manage. Note 50.

Pickford, S.G. 1990. Using Ryan's WNDROM model to predict winds in mountainous terrain. For. Manage. Note 48.

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