

PRWA Head Office
Box 26
Ymir, B.C. V0G 2K0

PRWA NEWSLETTER

The Pacific Reforestation Workers' Association is an association of silviculture workers, co-ops and contractors in Western Canada.

October 16, 1979 Vol III No. 1

PRWA Vallican Jamboree

40 MILLION FOR SILVICULTURE

The Ministry of Forests will increase the budget for silviculture in 1980 to 40 million dollars, more than double the amount spent last year stated John Bruce, head of silviculture. Bruce made the statement as he addressed PRWA members present at the Treeplanter Jamboree held in the Kootenays this August.

Bruce went on to describe the province's expanding silviculture program which includes federal financial support and incentives to encourage private industry to increase and develop their own silvicultural activities.

Bruce and other Ministry of Forest representatives from around the province and Lyle Nicholson representing the IWA met with Prwa members making brief presentations, listening to formal Prwa requests and entering into informal discussions on a wide range of silvicultural and organizational issues throughout the weekend jamboree.

Bruce stated that to keep up with the present rate of logging 150 million trees a year have to be planted.

Last year 67 million were planted. Next year 90 million seedlings will be available. To keep pace with logging plus catch up with an estimated backlog of 200 million trees with the next ten years treeplanters will have to plant almost 170 million trees annually.

This increase in silviculture work will not be restricted just to reforestation activities. Stand tending (juvenile spacing) will also be increased as well as many other intensive forest management projects. Present nurseries will also have to be expanded to accommodate the increased demand for seedlings and plans for expanding nurseries and transplant nurseries into the private sector are presently under review by the government.

PESTICIDES CONTROVERSY

The pesticide issue was a dominant theme of the discussions and study sessions held during the tree day event. Bruce after listing the various government agencies and regulations which control the use of pesticides in B.C. stated that the Ministry of Forests "is not the agency for determining the toxicity of chemicals."

Ministry nursery officials present at the jamboree were able to further explain the use and application of pesticides in the nurseries. Bruce went on to explain that the Ministry is investigating alternative means to

chemical prevention of disease, parasites and mold damage in the nurseries. He cited the success of freezing certain species of bareroot stock in order to prevent botrytis mold damage. This year none of the bare-root stock grown at the Chilliwack nursery was treated with fungicides owing to the success of this method.

MINISTRY AGREES TO PESTICIDE NOTIFICATION

The Ministry of Forests agreed to a formal PRWA request that pesticide notification be included on the contract description and later updated on the shipping invoice.

This notification will include a description of all pesticide and fertilizers used on contract seedling and the contract site and watershed, therefore providing treeplanters with a complete list of the chemicals they may be exposed to while planting trees.

The Health Committee later drafted a general resolution stating the Association's position with regard to the use of chemicals in silvicultural activities.

RESOLUTION
BECAUSE OF THE ACTUAL AND POTENTIAL MUTAGENIC CARCINOGENIC, TERATOGENIC AND TOXIC EFFECTS OF PESTICIDES AND THE POTENTIAL CATASTROPHIC RESULTS TO THE BIOSPHERE, OURSELVES, OUR CHILDREN AND THE HUMAN GENE POOL WE OPPOSE THE PRINCIPLE OF CHEMICAL CONTROL OF PESTS AND AFFIRM THE PRINCIPLE OF BIOLOGICAL AND OTHER MEANS OF CONTROL THAT DO NOT CARRY THE DISTINCT RISKS THAT CHEMICAL PESTICIDES CARRY.

Ted Davis co-ordinator of PRWA pesticide research presented his findings to date on Benlate and Captan, two fungicides used on the trees and regarded by many planters as hazardous to their health. The full text of this report is included in this Newsletter. Doug Jack, Chairman of the Health Committee pointed out that treeplanters should be made aware of the potential hazards of herbicides used on or near planting and camping sites.



Some of the Ministry of Forest Reps at the Jamboree left to right Gerry Kennah, Silviculture, Vancouver, Jim Sweeton, Administrator Surrey Nursery, Gordie Grunerud, Silviculture, Prince Rupert, Jim Sherb, Silviculture, Prince George, Jack Robinson, Silviculture Kamloops.

IWA-PRWA LIASON ESTABLISHED

Despite the fact that the PRWA has been consistently skeptical of involvement with organized unions, a committee of PRWA representatives has agreed to meet with IWA officials and form joint consultative committees on a regional level. The purpose of this move is to establish a means by which both organizations can exchange information and come to a mutual understanding of each other's activities. The decision to establish this rapport with the IWA came as a result of a presentation made by Lyle Nicholson of the IWA who was invited to speak at the Jamboree. Nicholson assured PRWA members that he was not here to sell the International Woodworkers Association but that he was there to learn as much about the PRWA as he was to explain about the IWA. These remarks came as a result of PRWA members fears that the union was out to get a "piece of the silviculture action."

Nicholson replied that isolated situations on the coast where planters appeared to be being forced to join unions represented an attempt by the unions to prevent private contractors encroaching on their territory and not an attempt to increase union memberships. He stated "We are not a profit-making organization on an ambitious march to get more dues paying members." Nicholson in his presentation stressed the highly democratic nature of the IWA

which he described as a "social union" as opposed to a "business union". He also pointed out that the PRWA might benefit from examining the organizational structure of IWA and possibly adapting some of these principles to its own organization.

CLOWN SHOW WIND UP

Not all the tree days were taken up with meetings. For those with low boredom thresholds and short attention spans there was food, drink and volleyball to be had. In the evenings there were numerous

informal musical jam sessions. The big dance featured the standard treeplanter aboriginal dance and percussion session that lasted for a good part of the evening.

Treeplanter and local musicians provided some interesting variations on technical difficulties and p.a. breakdowns which those in attendance danced to into the morning.

On Sunday some travelling minstrels happened by and ended the event with a clown show.

CONTENTS

Some of you may have given up waiting but here it is, another sporadic edition of the P.R.W.A. NEWSLETTER. In this MAMMOTH Publication there's hardly the space to make the same stupid joke about how the Table of Contents reads that we made in the last edition.

— **WORDS IN COLLISION** — The P.R.W.A.'s own Tower of Babbie, Dirk Brinkham, presents the Earth shattering revelations of the Legal Committee as it, in conjunction with the Health Committee present their **REPORTS ON PESTICIDES**.

— The editor takes a few metaphors to the Mixmaster and comes up with another **SNAPPY HARD HITTING EDITORIAL**.

— **MEANWHILE BACK IN THE REAL WORLD DEPT.** What do we treeplanters, airborne seedlings and the third world have in common? Don't miss **TREES PEOPLE AND THE FOOD CRUNCH**.

— **RUST IN PEACE**, the fate of the White Pine. Can plus Monticola survive blister rust and being 'salvaged'?

There's hope maybe.

— **LOVE IS LIKE A BAR AND CHAIN.** The Newsletter presents an Introduction to B.C.'s fastest growing silviculture sport. Juvenile spacing.

— '75 was a good year. The bidding game proves some stunning statistics.

— This of course is only a **PARTIAL PREVIEW** of what's inside. For all those treeplanters who haven't left for Guatemala this **NEWSLETTER** should keep you warm all winter. And if you read between the lines it could last even longer.

editorial

It's probably not too dramatic to say that the practice of silviculture is one of the most significant things to happen to the forests of Western Canada since the introduction of the axe.

Presently we are witnessing a growing wave of silviculture enthusiasm. Treeplanting and treethinning the two big guns of intensive forest management will be going off all over the place rather than they are aimed properly or not. Even if they're just firing blanks it will be a convincing sounding barrage.

Already some companies have recognized the good Public Relations value of reforestation and are busy lining logged sites near highways with large, pellet fertilized stock. Politicians will no doubt begin flogging the forests in earnest as this dwindling resource draws growing public interest. And the Unions have been on about the shortage of trees for some time now.

As silviculture workers we occupy an ironical position in this expanding picture. We are the lowest form of life in the process of managing the forest. Yet even though the tasks we perform are apallingly menial and most of us are ignorant of forestry theory, the planting and spacing of trees involve the most real and important decisions in the silvicultural chain of events.

This paradoxical situation is a little like a dinosaur. Even though some had two brains, the fact that the head end never knew what the ass end was doing resulted in the beast's extinction.

The threat of extinction seems even more real when the evidence seems to admit that the head end doesn't know what its doing either. There is a profound skepticism amongst many treeplanters that their work will be as effective as it could be. The survival rate of trees planted would indicate this. Adding more strength to their feelings of doubt silviculture workers experience first hand the transparent profit oriented motives of much of the forest industry, the bungling attempts of the Ministry of Forests to administer blanket policies over such a huge diverse province and their own sometimes varying quality of work. Add onto this the knowledge that most of the results of the silviculture program are unknown as of yet,

the evidence for their success and methods of implementation are based on comparison studies with other parts of the world and most provincial successes in intensive forest management have been restricted to one small corner of B.C.

The picture is not a very reassuring one when viewed in this context. It becomes even more chilling when one realizes that our silviculture program is all we've got and that its not an interesting exercise in farming our forests but the opening move in a desperate struggle for economic survival. The fact that some parts of the world timber industry have found it necessary to sail a portable pulp mill into Brazil is not a historic gesture of what modern economic man in search of wood fibre can do; its what he has to do. And what will we be doing when the crunch hits B.C.? Anybody thinking about floating Prince George down the Amazon?

The best thing that could happen to the forest of this part of the world is for silviculture to succeed. Even the most cynical forest critic will agree, admitting anything is better than plain old rape and plunder. The worst thing that can happen is for the silviculture program to be used as a statistical smokescreen with logging practices unchanging and forest management just becoming an ever larger bandage.

Treeplanters have always been wary of the numbers games and we must insist that expanding silviculture budget be used to implement real effective reforestation and rehabilitation programs, where project quality will overrule quantity of projects and the prospects for the forest of tomorrow will be based on live trees and not inflated statistics.

This may involve planting fewer trees, putting them in sites where they'll actually grow, developing alternative logging methods, restricting thinning to areas where it will give significant returns, spending more money to develop and rehabilitate sites that can produce trees but presently are not, decentralizing forest administration to localize policy and expertise to name a few possibilities. These are the directions we must attempt to move the expanding silviculture program because bigger is not necessarily better as any extinct dinosaur will admit.

Letters to the PRWA

Dear editor:

The Vallican Jamboree helped me to appreciate the treeplanter's concerns with stock quality and stock treatments. I hope my visit helped to clarify some of the issues, especially the controversy about fungicide application. I'll briefly repeat my explanation for those readers who did not attend the Jamboree.

At Surrey Nursery only the 1 plus 0 styro plugs to be stored for spring planting are sprayed with a Captan-Benlate solution. We consider it safe to have our nursery workers handle up to 15,000 seedlings per day one day after spraying. Styro plugs make up only one quarter of our production.

Bare root stock (and plugs lifted for fall planting stored for a short time only) are not sprayed or dipped prior to storage, unless unforeseen events make it mandatory (e.g. heavy frost damage to tips of 1 plus 0 coastal Douglas Fir for modpacking.)

All stock is chemically fertilized throughout the growing season and may receive insecticide sprays if the crop is threatened. However, thorough watering and the fall rains make it very unlikely that any traces remain on the seedling surfaces.

We should know more after testing this fall. I enjoyed the Jamboree very much. It's good to know our stock is in caring hands.

Your truly,
Hans Elias

EDITOR'S NOTE: Hans Elias is an employee of the Ministry of Forests. This letter is written as a private citizen and is not an official government statement.

Dear Folks:

T'was a good flash to see your first publication — dreams are coming true.

First of all let me introduce myself: Chuck Blackhall representing Pennyroyal Resources Ltd. We've been at it for nearly a decade now and this year we're busier and stronger. Treeplanting has gone through a lot of changes, but, as I see it, nothing has really changed — people working together doing something positive for themselves and learning the ways of nature-human and otherwise.

Whenever the Macachie Lake meeting was we along with Vince Brennon and others got together and put the wheels in

motion for some kind of organized body of contractors to deal with the Forest Service Green Meanies. We all felt the frustration of having no come back but to rant and rave about the situation in general and idle speculation as to our future in this wierd scene. I was the first to put five bucks into a kitty for organization and offered help in the form of support. I have documented this planting scene since the day I started with my camera, as a treeplanter come photo-journalist. I dream of putting together a book on the subject. Any advice, aid, support etc. you can give would be appreciated. I would like to submit some of my images to you for your issues.

Kindly put Pennyroyal Resources on your membership list. I would like to feel we are a member because of our own dues paid. But, I understand the need for bread to make those things happen the right way. Se here's our dues, good luck.

The Forest Service is acting like cops these days — friendly, yes, yet as narrow minded, defensive, blind to the realities that are before them. Their philosophy hasn't wavered or changed through the years — they believe nature is rational: equals, treat it right and it will make you a billion board feet a year. Paradox suppressed. Forest equals crops/scenery equals recreation/public equals money.

Let us all work for what we know is true and not be confused by the babble that goes on and be strong in the face of our downpressors — Get so you don't have to think about what your doing because you know what you're doing. Just like planting trees.

Your truly,
Chuck Blackhall,
Pennyroyal Resources Ltd.,
Victoria, B.C.

Dear P.R.W.A.

All right, all right — here's my five bucks. Having spent countless hours persuing the intricacies of the last newsletter and considering the pacity of appropriate reading material around some logging camps and

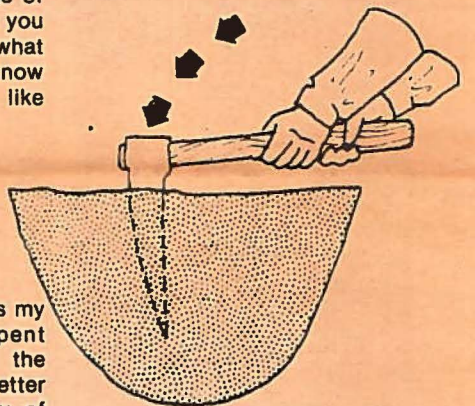
such. (Where would the Forest Industry be without Penthouse and Louis L'Amour??) I figure I better get on the mailing list.

Yours truly,
Bernice McGowan,
Whaletown, B.C.

Dear P.R.W.A.

Hey! Far out you guys. Congratulations on your great Newsletter. It sounds like we're finally getting somewhere. More power to the planters and more forests for the future. Let's get these logging companies more aware of what they're doing out there. They've been stealing our forests away for years now and giving us very little in return. The Forestry? Well they're a big laugh — most of those guys don't know their ass from a hoel in the ground let alone how to plant a tree. But don't get me wrong, I don't mean all of them are like that. There are a few of them out there who are doing a real fine job and are concerned about the future forests. How about we get a list together of all the logging companies that are doing a poor job and the ones doing a good job and let the public and Victoria know who is ripping off the land. Well anyway here's another eager membership for you. I will see if I can get lots more people to join up. Send me some more membership cards. And until later have a good season.

Yours truly,
John Stogrin,
Roxey Enterprises Ltd.,
Whaletown, B.C.



Apologies, Retractions etc.

No publication would be complete without a few glaring errors:

COLLUSION CONFUSION

In the last edition of the PRWA Newsletter an article entitled 'How We See Them', by D. Eagleheart, a misleading statement was made about the aims of the North West Forest Workers Association. One might erroneously infer from the sentence, "their (N.W.F.W.A.'s) immediate goals were . . . to eliminate competition between like minded contracting groups . . .", that one of the intentions of N.W.F.W.A. was to encourage collusion, an illegal business practice. This is clearly not one of the objectives of the Association nor did the article intend to imply this.

CREDIT DUE

The article 'How to Harden Your Hoedad for Life' which

contained a hitherto secret recipe for tempering the tip of your tree tamper was written by Dirk Brinkman and should have said so.

SEXIST NEWSLETTER

The reason there were no pictures of women in the last edition of the PRWA Newsletter or on the PRWA Membership Poster or Brochures was because there were no pictures of women available. In fact there were hardly any pictures available at all. This problem will be remedied when the Newsletter accumulates a larger photo library. In the meantime we apologize to those few (interestingly only males complained to the editor) whose sensitive political postures were put out of joint and we encourage those snap happy camera types to submit some of those photos they're always taking when they could be working.

PRWA NEWSLETTER

THE PRWA NEWSLETTER is a publication of the PACIFIC REFORESTATION WORKERS' ASSOCIATION, a sober group of people working in and concerned with silviculture in western Canada. The opinions expressed in this paper are not necessarily those of the PRWA. The head office of the PRWA NEWSLETTER is General Delivery, Balfour, B.C., VOG 1C0.

EDITOR: John Betts



Letters continued

To the editor:

If the PRWA deals with the biocide issue and does nothing else, then already there is reason enough to join it. This is an issue that affects every planter, contractor and even every resident of B.C., and individually it's hard to take effective action. What can we do as a group? Well that's not easy either, but the more numerous we are the more effect even small action, such as a group statement, will have — at least in having other folks hear and think about our concerns.

I was a bit disappointed with the three-day August conference, with respect to the biocide problem. It seemed like a lot of planters got bogged down in the controversy of "what are the real (tangible? guaranteed?) dangers of fungicides on the trees." And they probably weren't helped much by the presentations made on the question since there were two factions making presentations and they were each having trouble relating to the other.

The one seemed to say that there might be some cause to worry about the dangers of personally handling treated trees but that studies results are not really conclusive enough to know that for sure.

The other seemed to consider danger to be a certainty and then expanded graphically on each aspect of this danger. So people were left wondering "which side is right" and the potential for directing us to constructive and focused action was diffused by conflict about details. What I mean is — does it matter whether the mutagenic properties of captan do or do not make it to the human gut? I think the real question is much broader. Do we want to live in an ecosystem permanted with industrially produced mutagenic chemicals that are sometimes poorly tested, sometimes unnecessary and/or poorly regulated and which industry and government doesn't notify us of nor take responsibility for. Quite a mouthful, but I think most people will agree that the answer is NO.

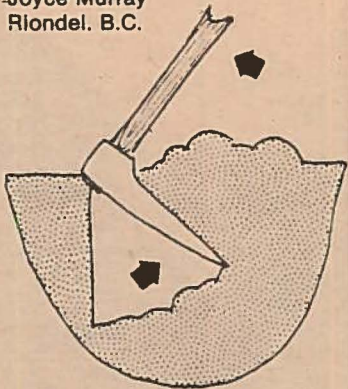
It's a question most of us have worried about over for years, but without an easy handle to grasp it's hard to feel the urgency that inspires one to do something. Especially when it's not obvious what that 'something' should be. So, here we have the handle; various fungicides snuck onto the trees we've been handling all these naive years; anti-pest and anti-brush chemicals sprayed over the areas we work in and drink water from — sometimes just — sometimes even before or during the time we are there. How much more immediate can a problem get?

The next thing to consider (now that every one's aware of the urgency of the problem and the logic of doing something about it) is what to do. Well, here's a start — join the PRWA to give it numbers (muscle) ideas and money, because it's got the biocide issue pretty high up in priority. Maybe write political reps about how you feel, though who knows if that

does anything. Write letters to editors of local papers (or even the PRWA newsletter) to get some exposure to our concern. Etcetera.

Find your own path, but DO SOMETHING.

Joyce Murray
Rlondel, B.C.



Dear Friends:

Enclosed a \$5.00 cheque for the membership fee in the Association. Sorry for being late.

May I also express my congratulations to your new Newsletter (Vol. II, No. I). The content, order and balance of all the forces involved is really fine and so is the literary style of the paper.

The people that express in the letter section the view that one more "fighting organization" has been created seem to forget that legal or organizational hassles are not necessarily the main point of the Association, also not to be underestimated. The help that can come to planters and contractors through a clearing house and a centre or two or three, where equipment can be gotten on short order or addresses in information exchanged ought to be obvious. And, I understand Brother Ray's paragraph about the destroyed mind, the drugs and the envelop with a name on it. Perhaps, he is being unawares exposed to drugs.

In particular where the chemicals encroached on us, we ought to keep a close vigilance. To compare aspirin with a fungicide is somewhat misleading because of the different nature of the two, even if the toxicity of the former is higher. And an office that keeps us, the people exposed to those things, informed, is sure worth while having. Who after all, washes his hands with soap (as is recommended in every seed catalog even by the commercial chemical oriented seed companies for seed treated with Captan) after he stops handling the trees and starts eating his lunch. The typical treeplanters gloves are no help in this respect. We may have to wear gloves to eat our lunch.

Barts Spinal Column is also a very helpful feature. May I point out that all the back-bends (forward and back) exercises in yoga can greatly help with a sore back. Better yet, strengthen your back before planting time arrives and you may not get into that post-planting crippled state. One I find helpful is the Cobra-type pose but with arms and hands on my back, lying in my sleeping back and tent and rearing up a little before sleeping and before getting up in the morning. It doesn't take any special setting.

Well, last but not least: the Association is a fine organ to keep in touch with each other and perhaps those occasional parties, that we so dearly love after a stint in the hills.

Good luck and greeting to all the friends,
Richard Eichenauer

Dear Sirs:

I will give you some time and support to see what will result from your Association. You said to mention any problems that I may have encountered. One is prominent in my mind.

I bid on a planting contract last spring and had the second lowest bid. The successful bidder was the School Board of Terrace. What I feel is unfair about the bid is that the labour for the school board was free and very cheap. The transportation to the site was paid for by tax payers because they had the use of school buses and the teachers were getting paid by taxpayers. As far as I'm concerned it is an all around sham.

That's my pet beef right now. I would like to see what the Association can produce concerning this matter.

Looking forward to your response.

Your truly,
D.R. Hagan,
Terrace, B.C.



Dear P.R.W.A.

Right now my eyes are burning and I'm sure it's from the fungicide. I like planting trees, but I won't plant next year if the trees have chemicals on them. This is what motivated me to send in my five dollars and join the Association. Before I was just lazy about it.

I'll finish planting this season but I'm going to be a lot more careful with touching my face and food. Two of our best planters just quit because of the fungicide. It appears Forestry is lying to us about the possible harmful effects. I think there may be ground for a lawsuit against them for not telling us in the past two years.

Best of luck in gaining support and being effective.

Yours truly,
Gary Ogilvie

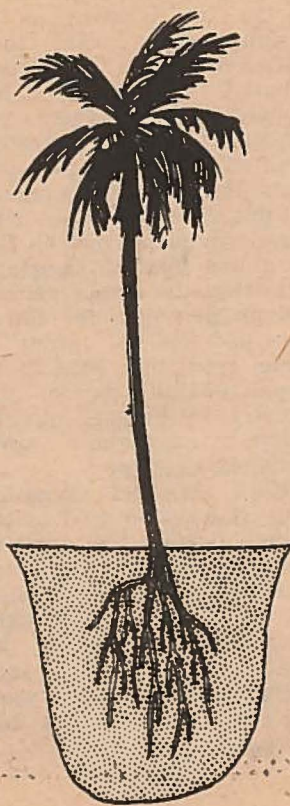


Dear P.R.W.A.

There are grand 'decentralization plans' afoot in the Forest Service which in the Nelson Regional District apparently include the closing of fifteen of the present twenty-two Ranger Stations. Our local Lardeau and Kaslo Ranger District Stations are among those to disappear. Under the regimen rangers will be travelling up to 150 miles one way from their offices to logging sites. Another wrinkle of the new scheme is a monthly mileage limit. It seems someone in Victoria wants to keep rangers truly desk-bound. Forestry personnel whom I talked to through the course of this treeplanting season seemed discouraged and some were outright demoralized at the prospect of being relegated even more to a paper shuffling role. For us most public business now conducted through the local Ranger's office, such as cutting permits, treeplanting and treethinning contracts, burning permits, scale returns etc, will be moved to some distant office.

Incredibly all this goes under the "decentralization program", presently underway in the Forest Service. White is now black, folks. Letters, to the Minister of Forests, objecting to these closings brought Tom Waterland's bland assurance that nothing will be done without consulting the committees involved. Meanwhile, everyone in the Forest Service knows that the Ranger Stations closing are pretty much in the bag unless there is strong public reaction. Say your piece.

Yours truly,
Dave Putt,
Argenta, B.C.



Coming Attractions

In our next edition of the PRWA Newsletter, already in the process of being procrastinated, we plan to feature; a look at the prehistory of treeplanting in B.C., memories and anecdotes from one of the first private treeplanting contractors who worked in the province back in the forties, a special Know Your Enemy section devoted to examining the mating and other disgusting habits of the airborne carnivores and assorted biting flies we cohabitate with all spring, and an introduction to another forest skill, Cone picking. Then again we might not. Renew your membership or join up if you already haven't to keep on the Newsletter mailing list.

Annual General Meeting

Vancouver, December 7 1979

Annual General Meeting
Vancouver, December 7, 1979

The PRWA annual general meeting will be held at the Odd Fellows Hall on Friday, December 7 at 9 a.m. The hall is located one block north of 1st and Commercial at 1718 Gravelly St.

The hall has a kitchen and a benefit dance is planned for the evening.

Treeplanter Comix No. 2

Guaranteed fun. No chance of making money. A second treeplanter comics is in the works and all witty, droll or artistic forester or treeplanter types are asked for contributions and should get in touch with either of the following:

Brig Wieler — Kootenay Bay
Lionel
1560 Comox St.
Vancouver Phone 681-1946
Mary Anne Moss
Surge Narrows V0P 1W0

NEWSLETTERS Available

Available are a few back issues of the Newsletter and some Jamboree Posters. These can be had for the price of the postage care of the Newsletter, Gen. Del., Balfour, B.C. V0G 1C0.

Vallican Jamboree- The General Meeting and the Meetings in General

"Shall we vote to proceed in an orderly manner" Roberts rules the day, sort of.

For some the conclusion of the Jamboree was accompanied by a feeling of frustration. There were as many issues and presentations that never made it to the floor as there were that did.

The meetings were not always effectively chairmanned and the discussions often meandered. The large group participation often made it hard some parties to discuss specific issues. But nevertheless after almost six months of being effectively dormant with the vast majority of its members spread throughout the province working the PRWA managed to refocus and re-activate itself at the Vallican General Meeting.

Of particular note was the response of the Ministry of Forests and their consistent interest the Association. Early Friday morning, the first day of the Jamboree, Forest Service representatives outnumbered the PRWA members present at Vallican. Some of the Ministry reps had travelled from as far away as Price Rupert and many of them stayed on through the weekend.

There were many familiar PRWA faces at the meeting and those who were not at the Jamboree in Vallican will hopefully be present at the General Meeting in Vancouver in December.

The first issue discussed was the need for more money and members. The need for these is obvious and there are plans to vote to increase contractor and membership fees at the next general meeting. Fund raising will continue in other forms particularly the dance benefit. The success of the Prince George Treeplanter dance, which was due largely to the efforts of Holly Arntzen, provides sound encouragement for similar efforts. Other avenues such as government grants and assistance are being investigated as well.

The general assembly voted in favor of establishing a liaison the IWA Leon Pendleton and Bob Ploss both were nominated to represent the PRWA in the interior and a search is underway for representatives to attend regional IWA meetings on the coast as well.

The distribution of a 'Planters Beware' publication, by some PRWA members, early in the spring, which unfortunately contained some mis-information regarding pesticides prompted a discussion regarding the credibility of the PRWA and who should be its legitimate spokesmen. Five members were chosen including Peter Kendall and Leon Pendleton of the Board of Directors, Dirk Brinkman and Ted Davis, chairmen of the Legal Committee and Health Committee and the editor of the Newsletter, John Betts. These five through a process of mutual consultation will make official PRWA statements. More importantly the discussion

revolved around our inexperience in dealing with the media and their ability to distort and plainly mis-report statements by unwary members. Members are advised to make sure that opinions stated are clearly indicated to be personal ones.

The Newsletter was encouraged to continue with its present format of being typeset and widely distributed throughout the province despite the fact that this was costly.

The Legal and Health Committees made lengthy reports and they can be found in this Newsletter.

The need to tighten the constitution was brought up and the Legal Committee has promised to take appropriate action. Clean trees, quality trees and our need for more muscle all received encouragement from the members present. The need to create more realistic day care facilities in treeplanting camps was mentioned and perhaps did not receive the attention it deserved. It was pointed out that some contractors seem to wrongly think that cooks can manage the children as well as the food.

Unfortunately there were no representatives from south of the border at the Vallican Jamboree but a continuous exchange of information has been taken place. Invitations will be sent to NWFA to send representatives to the Vancouver General Meeting.

The field co-ordinators for each district all agreed during a PRWA-Forest Service discussion that they found little difference in the quality performance of contracts let at a high price compared to those let to a low bidder.

All the co-ordinators when asked how many contracts were penalized all reported that only one or two contracts in each district were shut down for less than 85 per cent quality or other problems. They also reported most contracts received 100 per cent payment.

PRWA members went on to discuss the frustrations of working under what they described as a "punitive oriented contract." Some planters asked if checkers were encouraged to be deliberately harsh at the beginning of contracts. The co-ordinators replied that this was not the case. John Bruce commented that he had heard this kind of complaint against negative encouragement through penalties for thirty years and that the variety of human types that have to be accommodated within the Ministry of Forests quality system demand this disciplinary posture.

PRWA members suggested bonus systems be used to encourage quality but ministry replied it could not budget for bonuses. It was then suggested that a bonus system might balance itself out against the penalty system, evenly distributing monies that were held back for infractions and poor quality.



Blackhall

Growing Our Own Seedlings

The response to the government's White Paper on growing tree seedlings has produced the following interim policy.

The Ministry of Forests has the primary responsibility for ensuring the production of an adequate and reliable supply of seedlings for all forest lands in the Province.

This responsibility can best be achieved by ensuring continuing production from Ministry of Forests' nurseries, and by encouraging commercial and industrial nurseries to participate in seedling production to meet identified needs. Submissions to the White Paper on seedling supply strongly supported certain features:

1. Continued Ministry of Forests' responsibility for ensuring adequate seedling supply for all reforestation needs in the Province.

2. Participation of private enterprise in nursery operations and tree seedling production.

3. Continued operation of Ministry of Forests' nurseries, with expansion, if necessary, to

meet the responsibility specified.

4. Regional and local participation in seedling production wherever economically and biologically practical, particularly for transplant stock.

Consistent with these features and the major thrust of the Task Group recommendations, the interim policy will be as follows:

—The Ministry of Forests will continue to supply all stock free of charge until the new policies are approved and implemented, at least through 1980.

—The Ministry of Forests will contract tendering for transplant stock and other stock types on a pilot scale in situations of local shortfall and perceived need, commencing in the Spring of 1980, as mutually agreed to by the Regional Manager and Silviculture Branch Director.

—Pilot production by private operations should be based on demonstrated capacity and ability, to the satisfaction of the Regional Manager, to be phased-in incrementally to meet approved local requirements.

—While not precluding other stock types, transplant facilities by private nurseries would be the logical first stage to be encouraged, as such operations can be set up with limited capital investment, can be localized, and will offset anticipated shortfall in Ministry of Forests' transplant capacity.

—Private nursery participation in this interim phase will be limited to short-term contracts, with continued participation dependent on demonstrated performance in quality seedling production and economic efficiency.

—Where no qualified private party is prepared to fill identified stock requirements in specified areas, the Ministry of Forests will seek funding and authority to develop the local capacity as it is required.

The long-term policy requires extensive input from outside parties and may require legislative change and/or introduction of regulations. It does not appear reasonable to expect they can be fully implemented prior to some time in 1980.

Human Right's Branch's Investigation

In the last edition an article entitled 'Discrimination' outlined a complaint against MacMillan Bloedel for refusing to allow women treeplanters to stay in a logging camp. The Human Rights Branch sent this reply on completion of their investigation.

"I am pleased to report that we have received assurances from MacMillan Bloedel's Labour Relations Manager, Mr. J. K. McLeod, that a meeting of Division Managers held on January 20, 1979, at which the Regional Manager impressed upon them the importance that all divisions conform to the requirements of the Human

Rights Code. We have assurances from them that they will comply with the provisions of the legislation and that no further discrimination on the basis of sex would be anticipated. This reflects a direct change in previous policy, or at least in practice of the Division Managers operating in remote camps."

Legal Committee Report



By DIRK BRINKMAN
Pesticides and PRWA

There have been some misunderstandings that have led to criticism of the way the fungicide issue was handled by the legal committee and reported in the newsletter. A brief history of PRWA involvement with pesticides seems to be in order.

The pesticide issue was first brought up in the PRWA December meeting. Although no one knew at that time what chemicals were being used on the trees, the legal committee published the statement in the Dec. Newsletter that it would hold the forest service responsible for any effects from chemicals on the trees. In January a circular was sent by Dave Armit (I.C. Nurseries) to nursery superintendents and district managers, which warned them that Captan, Cygon and Benlate were possible carcinogens, mutagens and teratogens.

As a result of this, the committee rough drafted a letter to Tom Waterland, Minister of Forests, regarding the use of these chemicals. The letter was approved by the PRWA at its Feb. 4 meeting. It described the planting circumstance and concluded; there is no way, no matter what precautions are recommended, that the BCFS can expect the planter to be able to keep any chemicals that are on the trees out of their bodies. Therefore the PRWA made the following requests:

- 1) That BCFS prepare a complete silvicultural and moral justification for using these fungicides and publish it in the upcoming newsletter.
- 2) That the Ministry of Forests ask the Ministry of Health to assess the hazard of these chemicals in the planting circumstance.
- 3) That the contractor be notified of all chemicals on the trees.
- 4) That if the fungicides were shown to be unsafe, or if there was no good silvicultural justification for using them, that application stop immediately.

In our meetings with Tom Waterland and with Dave Armit it was emphasized that it was not the toxicity but the long term effects that concerned us. Armit assured us there was no medical record of any serious hazard to humans. He said that he knew of no long term population studies done on people exposed to these fungicides. Armit stated that the fungicide memorandum sent to nursery superintendents and district managers about the possible harmful effects of Benlate, Captan and Cygon was a warning issued with many chemicals because such chemicals could make changes in living systems. He pointed out that there was no evidence that

he knew of that Captan or Benlate were mutagenic, teratogenic or carcinogenic. Cygon, Armit said, had not been used for two years, since it seemed the Forest Service recognized it as the most harmful of the three fungicides.

By the time the legal committee had exhausted its supply of volunteer energy and time and in order to meet the Newsletter deadline published what little reliable information it had that specifically related to the fungicides. Since then much more information has been made available; much of it conflicting none of it very conclusive.

In April the legal committee undertook to have some trees analysed for fungicide residue. The trees were delivered to a lab at Simon Fraser University but the analysing equipment malfunctioned. A private lab offered to analyse the trees and do a literature research for a thousand dollars. This offer was being considered when it came to our attention that the Ministry of Forests was planning to analyse the trees.

By the time of the August Jamboree the following had happened. Armits, Ministry of Forests' reply, was published in the Newsletter, John Bruce's efforts to notify the Minister of Health regarding our concern over the fungicides was referred to a federal department and has come to naught, Ted Davis has done the research on the literature on the fungicides used which was presented at the jamboree and the Forest Service has agreed to provide us with more extensive notification regarding the use of pesticides.

Pesticides and Notification:
August Jamboree
PRWA-BCFS

In the first few hours of the PRWA meeting the Legal Committee and the Health Committee asked John Bruce (head of restation) and Jim Sweeton, (head of nurseries), for complete notification of the pesticides on the trees, on the site, and on the sites watershed. Jim Sweeton and Hans Elias (Surrey Nursery), after brief discussion, agreed that it would not be difficult to provide the districts with the complete record of treatment of each seedlot.

John Bruce agreed to take on the more difficult task of arranging to provide contract descriptions with site and watershed history. He readily acknowledged the value of such information. Later in a meeting of the legal committee and the health committee this request was formally drafted and subsequently approved by the PRWA, as follows: WE REQUEST THAT AS PART OF THE CONTRACT DESCRIPTION THERE MUST BE 1) THE DATE, CHEMICAL AND AMOUNT OF ALL PESTICIDES AND FERTILIZERS USED ON THE CONTRACT SEEDLINGS WITHIN THE PAST YEAR, BOTH AT THE TENDER DATE AND, UPDATED, ON THE SHIPPING INVOICE.

2) THE DATE, CHEMICAL, AND AMOUNT OF ALL PESTICIDES AND FERTILIZERS USED ON THE CONTRACT SITE AND IN ITS WATERSHED WITHIN THE PAST YEAR.

PESTICIDES ON THE TREES

We understand that the pesticides and fertilizers with date and amount used for each seedlot are summarized for nursery use already. Notification seems to be as easy as xeroxing these sheets and forwarding them to the appropriate district office for inclusion with the contract description.

TESTING FOR PESTICIDES ON THE TREES

The forest service has contracted the Ministry of Environment lab at U.B.C. to test the trees for fungicides. At the meeting the PRWA expressed concern that the trees tested in the summer would not be representative of trees ready for planting spring or fall. The PRWA recommended designing the experiment so that the trees would not be selected more or less at random as BCFS planned. It was proposed that the trees be treated with fungicides immediately before the test and that the tests continue at certain intervals until no more fungicides were detected in order to determine how long they remained on the trees. The PRWA requested that, at the time of these tests, all the pesticides and fertilizers these trees had been treated with should be tested for. These tests should also continue until no further residue is detected or until the longest possible storage time has elapsed.

The PRWA also requested that the tests be done at two separate laboratories to ensure reliable results. In this way the Forest Service could develop data on how long all pesticides remain on the trees. This information could then be combined with the notification to determine whether or not there are any pesticides on the trees, enabling the contractor to make an informed bid (or choose not to bid), and the crew to decide whether or not to plant these trees and how to take necessary precautions. The forest service agreed to let Ted Davis (PRWA Health Committee) work with Hans Elias (Surrey Nursery) to design the analysis experiment to accomplish these objectives in the Ministry of Environment Lab at U.B.C.. Ted Davis is continuing our original liaison with Simon Fraser. He will eventually have them do the second tests to confirm U.B.C. lab results when their machine is in order again.

PESTICIDES ON THE SITES

In January the PRWA began investigating notification of pesticide treatment on or near project sites. Doug Jack of the Health Committee wrote to the Pesticide Control Branch requesting records of permits issued in the past year for silvicultural use. B. F. Vance, director of the P.C.B., replied that the files were available for inspection and that he believed the information could be compiled in four or five days. Alan Cairns of the PRWA Health Committee spent three days at the PCB office summarizing applications for silvicultural use. This information unfortunately went unused since there was no effective manner in which the PRWA could notify contractors. It was apparent many treeplanters could be effected by the pesticides' use.

There were over 150 permits issued, many for aerial spraying of large areas. For instance, aerial spraying of Cygon YE in the Prince George District seed production stands to control of spruce cone insects, spraying of Amitrole-T for roadside brush control at Tom Brown Lake, Wakeman Sound, the application of Denitro general weed killer for vegetation dessication at Cogburn Creek, Harrison Hot Springs area, 2-4D for alder control by basal notch and foliar spray at Squirrel Cove, Cortes Island. These examples were chosen because they are all known to be near sites where treeplanters worked or lived this spring.

Vance stated that pesticide use on private land does not require a permit issued by the PCB. Some companies had in the past applied for permits for pesticide use on their private lands as a matter of course but had dropped this practice because of the public protests they had encountered.

Private forest lands yield only five per cent of the forest harvest, however these areas seem to receive a greater degree of intensive pesticide and fertilizer applications than public land. Companies letting thinning and planting contracts on their private lands would not be effected by the notification requirements the PRWA has asked of the Ministry of Forests.

B. Vance went on in his letter to the PRWA to state, "We have endeavored to see that each ranger district is advised of all use of pesticides under permit in their area. Consideration might be given to having reforestation workers contact these offices to ascertain if pesticide use has occurred in the specific areas they are intending to work in."

It is the PRWA position that it is the Ministry of Forests responsibility to inform the workers through the contractor of the pesticide history of the work site and watershed.

Possible exposure to pesticides does not occur exclusively from silvicultural uses. Hydro power line right of ways, railway right of ways and agricultural lands all provide major sources of pesticide exposure. Planting camps are not the only potential victims. Berry pickers, tourists, hunters, surveyors and prospectors to name a few all stand to benefit from pesticide notification.

The forest service is the logical agency for collecting and keeping records on pesticide use on the scale the PRWA is suggesting. The Forest Protection Branch presently has a provincial mapping system for its pest control programs. Proper site notification would entail co-operation between various government agencies and industries to design channels to direct and focus the information into Ministry of Forest Regional District offices for compilation. Ted Davis of the Health Committee has recommended mapping the locations of pesticide applications onto longitude-latitude grid systems and computerized for instant recall.

The positive response of the Ministry of Forests to the PRWA's request for site notification is an important first step in



developing this system. The PRWA is committed to promoting regulations enforcing the posting of notices with all pesticide and fertilizer application around work sites. As well the PRWA want all pesticide sales to be publicly posted and violation subject to fines and possible loss of applicator licence.

In the meantime silviculture workers are advised that it is their responsibility to obtain information about pesticides from the contractors they are working for.

WHO IS RESPONSIBLE?

At present a more sophisticated health questionnaire is being developed to determine if treeplanters suffer from ill health related to the possible hazards of their work. If some chronic illnesses are demonstrable especially those related to exposure to cancer or mutation producing agents, the issue of who is responsible is immensely complex. Historically the Worker's Compensation Board does not consider carcinogenicity or mutagenicity compensatable.

John Bruce was careful to point out explicitly in his presentation to the PRWA that the Ministry of Forests is not the agency responsible for the authorization of the use of chemical pesticides.

The PRWA Legal Committee takes the position that until there is complete notification from the Ministry of Forests for all the pesticides on the planting stock, the Ministry of Forests is responsible for any harmful effects these have on anyone handling these trees, and until there is complete notification of the use of pesticides and fertilizers on the work sites and work site watershed the Ministry of Forests is responsible for any effects these pesticides or other chemicals may have on the crews working in these areas. The PRWA also considers that until companies provide the Ministry of Forest Regional District Offices with records of their fertilizer and pesticide programs that they are responsible for any harmful effects these chemicals may have on their workers.

The PRWA feels that too many pesticides have been approved for use and then after a few years of application found to have harmful effects. As a result the PRWA does not regard the present methods of government licencing procedures as adequate controls. The PRWA is also suspicious of the chemical industry, who protected by corporate law and limited liability and interested primarily in profit, do not seem to be as concerned about human health as they should be.

Continued page 6

THE WCB RATE

The Legal Committee will soon be contacting contractors asking for financial and morale support to lower the WCB rate. In 1978 the WCB took in \$55,942,000.00 more in assessments, etc. than it paid in wage loss or spent in operating expenses.

MANPOWER TRAINING PROGRAM

The Prwa and Manpower will meet late this fall to discuss guidelines for the application of the Industrial Manpower Training Program to juvenile spacing and treeplanting. This spring one week of training was allowed for planting. At present two weeks are allowed for spacing provided, half the time is spent in theory (chainsaw safety, maintenance, silviculture aspects, etc.). The PRWA plans to present and recommend training program outlines longer than the present time periods. The idea of a multi-skilled forest worker will also be discussed. The legal committee hopes to establish some changes in present regulations so that the sometimes unconventional styles of some PRWA contractors and co-ops can be more easily accommodated into the Manpower Industrial Training program. These meetings with government agencies are important steps in making silviculture workers respectable and recognizable entities in the work force even though we don't adhere to the standard conventions.

Prince Boogie George

Way back in June the first annual Prince George Treeplanter Boogie was held in the Elks Hall. Naturally it was a stunning success. Everyone danced to Pied Pear who responded to the enthusiasm with typical flair.

Everybody drank lots of beer. Nobody got arrested. Almost four hundred people showed up and not all were working close to Prince George. Hardly any PRWA memberships were sold despite determined attempts. The band got paid, the Association made lots of money, the Elks Hall was left standing, suitable for reuse maybe next year and the Coast Range Treeplanters who manned the door, bar and bottle return got to drink the leftovers. Everybody was happy.

How come it took so long to put one on?

Next year we can rent a hotel, rooms are cheaper by the dozen, and we can have a convention and write it off as brain damage and business expense.

Right?

N.W.F.W.A. Notes

NWFWA sent the health committee of the PRWA a package of some of their literature. It included their July 28-31, 1978 minutes, a list of member coops with a brief description of each, NWFWA by-laws, and several excellent articles on herbicides from their members. Their minutes seem to indicate productive meetings. Here are some interesting bits from that package:

NWFWA was involved in 1978 in trying to get herbicide treatment of the sites to be part of the contract description. History of the site treatment is "critical to making an informed bid and deciding to bid at all." They were asking for "re-entry guidelines for treeplanters and other forestry workers. That the EPA define a time period after spraying during which workers should stay out of the spray areas." The package included a basic guide to taking water and ground surface samples for analysis of sprayed areas. They are involved in a "Herbicide Efficiency Study" to compare chemical and hand thinning costs and effectiveness. "The human operator of the chainsaw, being intelligent, can do a more exact, appropriate and complete job than any chemical can," Gerry Mackie is quoted in the

minutes. Nwfw is developing an "information bank of forestry and related topics". Members were "requested to provide annotated bibliographies for published materials they know to be valuable."

The amount of erosion control, site rehabilitation and watershed management the NWFWA member coops engage in is a reminder of the need for this kind of work in B.C. A lot of productive land is being lost in this province each year.

The amount of erosion control, site rehabilitation and watershed management the NWFWA member coops engage in is a reminder of the need for this kind of work in B.C.

A lot of productive land is being lost in this province each year. Thousands of tons of unnecessary erosion of top soil and organic material is being washed into our lakes and rivers overloading their eco-systems. Get off your ass Ministry of Forests. Keep up the good work down there NWFWA. Copies of any of this material will be available from the Legal Committee for xerox and mailing costs.

PRWA Legal Committee
c-o Dirk Brinkman
Box 4
Riondell, B.C.

Thinner and Christmas Trees

Thinner who are working on contracts this fall should investigate the possibilities of selling some of the thinned trees as Christmas Trees. The trees require a good frost to 'set' the needles so that they don't turn color once they are cut. A 'Christmas Tree Manifest' is required from your local Ranger station so that the standard stumpage can be paid (10c a tree). Douglas Fir is the

preferred species and the limbs should be close together (6") with dense foliage.

The big buyers are in the Cranbrook-Invermere region according to one unreliable source and the price to you is around three to five dollars a tree. If you're ambitious you can ship them as far away as Hawaii and sell them yourself for twenty bucks each.

Seedlings Destroyed

Jim Sherb, field co-ordinator for the Prince George District reported that two million seedlings were returned from company and Forest Service projects. Spring of this year came unusually late and many contractors became over-committed. By the planting cut off date of June 30 in the Prince George district there wasn't much hope for the unplanted trees. 600,000 trees could not be put back in the nurseries and were destroyed.

treeplanters and contractors available and looking for work late last spring. Unfortunately no effective means was available for reaching these parties and the work was lost.

Contractors are advised to check into Ranger Districts to see if unexpected work is available. The Forest Service also plans to take measures to prevent crews from overcommitting themselves. The PRWA has been asked for suggestions to prevent this situation from occurring

Ironically there were

ain.

Clearing House Survives

Despite an uncertain history the PRWA Clearing House still exists. It has the same address as before:

Box 24608
Postal Station C
Vancouver V5T4E1

Pauline Kendall has assumed its responsibilities and after spending last fall buying and shipping food for a number of contracts, she has accumulated some expertise in this field.

A guideline for food and equipment shopping is forthcoming. Just how many of the other intended functions of the PRWA Clearing House that might continue depends on the information and assistance Pauline receives.

Poor Performers

In the Association's struggle to get bad contractors out of the business, one small step has been made. The following Amendment to the Reforestation Manual appeared this summer under the heading of eligibility:

"Past performance on Forest Service or licensee contracts may have to be checked; where previous Forest Service contracts have been poorly conducted either through failure to complete, or quality below minimum standard, there is sufficient reason to disqualify awarding, but the contractor must be contacted and advised accordingly."



Trees, People and the Food Crunch

By JOHN T. BONSMMA

For those folks who don't know how important trees have been to human history, consider the following:

1. The most savagely eroded landscapes in the world today are found in Ethiopia and China. The rich silt that has been labelled the "gift of the Nile" and which has sustained Egyptian agriculture for centuries (before the Aswan Dam, that is) came down the Nile courtesy of some massive deforestation in Ethiopia. The same process has happened in China. Well before the birth of Christ, China had deforested its watersheds, creating the huge silt loads of the Chinese river system. These loads are the heaviest in the world even today, and have produced the floods that have taken so many lives along the Yellow and Yangtze rivers. These lunar landscapes were created by human population pressures in the form of (a) firewood collection (b) overgrazing (c) the migration of land-hungry populations from the lowlands to more fragile highlands.

2. An ecological catastrophe caused by deforestation is going on in Nepal, for the same reasons. But Nepal's position as the ecological "nerve center" of the Himalayas makes deforestation there more dangerous than in other places. Erosion of Nepal's fragile mountain water sheds has a disastrous effect downstream on the irrigation and water supply systems of Pakistan and India. Experts have given Nepal only 20 years to reverse the devastation of its water cycle caused by uncontrolled deforestation. What is at stake is nothing less than the precipitation cycle of the Himalayas and the "downstream" nations.

3. Lebanon used to be famous for its cedars. Today it displays the same arid landscape as Greece, the Aegean coasts, Israel, North Africa — all of which were noted in Homeric and Roman times for their tree cover and their animals. Read the Old Testament or Homer's Iliad and Odyssey to get an idea of how rich those regions used to be: wolves, lions, bear, exotic birds, pomegranates, vines . . . Nothing is left of them. Only Israel is committed to the rehabilitation of its landscape through reforestation. And what caused this deforestation? The same reasons as above — plus the introduction of "the poor man's cow": goats.

4. Does anybody remember the big famine in the Sahel part of Africa in 1973-74? It was caused by deforestation and overgrazing. Every tree for hundreds of miles around was chopped down to feed swollen herds of cattle, whose development had been urged by international development agencies. Once the trees were gone the rest of the ground cover went the same way: into a cow's belly or blowin' in the wind.

These examples may appear a bit mind-blowing, but they point to one fact: deforestation has been much more prominent in human history than has reforestation. It is very rare that this dynamic has been reversed, but today we have no choice. We

have got to reverse it. And we might have to do so on a scale that doesn't normally enter our thinking.

As an employee of the largest aircraft manufacturer in the world (the Boeing Company), I have a special interest in reforestation on this scale, because I feel that the immensity of the land areas that will have to be covered is such as to require aerial reforestation in large tonnages. I realize after talking with my friends in the B.C. treeplanting community (Dirk Brinkman and John Huizenga) that aerial reforestation poses all kinds of problems at least in B.C.: seedlings get dropped onto rocky areas where they are wasted, capsulation techniques either aren't good enough or are too heavy, when you're thinking of dropping large tonnages at a time, to make for great efficiency.

Nevertheless, I feel that there are some good arguments for looking at aerial reforestation. One is the problem of getting manpower into the remote or arid areas of the Third World that need reforestation. A good example is China, which is already using every last ounce of manpower on labor-intensive flood-and silt-control projects and, funny as it may sound, would have serious problems in establishing and sustaining large labor-intensive tree-planting operations in the remote watersheds of the Yellow River and the Yangtze River. In all, the PRC does not have manpower to spare for tree-planting operations on the scale that would be needed.

The same problem exists in the Sahelian area, where large expanses of wasteland would have to be covered but where there simply isn't enough water or manpower to support labor-intensive treeplanting operations. I also feel that there has been so little investigation into the trees and groundcovers that could be seeded in these areas that we're not even sure as yet how efficiently these trees or other vegetation could be grown in nurseries. The tree-planting techniques used in B.C. have fundamental restrictions on their transferability to other parts of the world in this respect: they are devoted entirely to conifers, and they are planted in water-rich areas. Few places in the world can offer matching ecological features, particularly in the Third World.

I can't help but look at the cargo capacities of aircraft like the Boeing 747, or even larger aircraft such as the military is looking at, and wonder what one couldn't do with 300-500,000 lbs. of cargo capacity. Sure, it's an expensive way to operate — let's not kid ourselves; but these planes could be used in areas where it would be prohibitively expensive to mount labor-intensive tree-planting operations, and they could do it much faster. Outfits like Weyerhaeuser in Federal Way, Washington and the larger Canadian wood-products companies should be given every incentive to develop aerial seeding or encapsulation techniques for trees like *Leucaena* or other species that



could be used in Ldc reforestation. Above all, the tree-planting community should take a lot more interest in aerial reforestation, particularly in the development of capsulation techniques that could be used in water-poor areas.

I realize that some of these ideas sound a bit far-fetched, but I am suggesting them to the B.C. tree-planting community for these reasons:

1. Reforestation is probably the single most important requirement for the survival and development of the world's poor countries. The expertise in reforestation that has been developed by B.C. treeplanters and official forestry bodies may be transferable to other regions of the world and to non-conifer species.

Anybody who works on reforestation in B.C. should have some idea of how unusual this province is: along with the U.S. Northwest states of Idaho, Oregon and Washington, B.C. is the only wood surplus area in the world today. I mean "wood-surplus" on a sustainable scale, not the kind of luxury-trade lumbering of exotic hardwoods that is going on — with irreversible consequences — in Malaysia, the Philippines, and places like that. The only area that comes close in potential exportable tonnages of general-use wood is Russian Siberia — and the millions of tons of potential wood products that exist in Siberia can't get out to the coast, because there is as yet no way to get them out there.

The Russians are putting in a northern leg to the Trans-Siberian Railway, called the BAM Baikal-Amur Mainline) — but until the BAM is finished (way behind schedule), nothing will come out of Siberian forests to match the tonnages that are being exported from the Pacific Northwest States and B.C. Even with BAM, lumber exports from the BAM region will probably lag well behind more lucrative exports like minerals, gas, possibly oil.

Let me put it to everybody this way: a lot of people in B.C. have the same attitude toward forest products as the Arabs used to have toward oil. In relation to the world's wood supplies, B.C. and the U.S. Northwest provide the closest parallel to a "wood-lumber-pulp" cartel on the scale of OPEC that anyone could want. The amount of wood that is available on a per-capita basis in B.C. and the U.S. Northwest dwarfs that of the rest of the world. Dr. George Borgstrom, author of *Too Many*, points out that the monopolization of the world's wood supplies by the rich countries is more serious than their monopolies in oil and food. Nations that are rich but wood-poor like Japan and the continental European countries can always outbid poorer nations in the brutal competition for structural timber and pulp — and this competition is more serious than that for food, funny as that may sound.

As I noted earlier, it is hard for even professional forestry people in B.C. to realize how well

off they are in relation to the rest of the world, as far as wood supplies go. The ecologies of poor nations like Tibet, Ethiopia, India, Pakistan, Niger, Chad, Mauritania, Indonesia — in fact, virtually every nation on the tiers of the "Third" and "Fourth Worlds", even those with lots of oil — are being destroyed by the fuel-gathering and lumbering activities of millions of rural poor. It is common for LDC rural families to spend over 50 per cent of disposable income on firewood — and to spend as much as one day out of the week collecting it or in walking long distances to buy it.

Let me summarize all of the historical examples that I trotted out in front of everyone at the start of this essay: deforestation, primarily caused by population pressures (firewood-gathering, indiscriminate lumbering, over-grazing of ruminants), is probably the most fundamental dynamic in the "eco-history" of civilization. What happened to China, Greece, Ethiopia, India, Israel, the Aegean coasts and islands, North Africa and central Africa is being duplicated today all around the world. A few examples.

1. The extent of deforestation and overgrazing in the African Sahel countries is so extensive it can now be mapped by NASA satellites. In fact, these satellites uncovered an unusual feature in Africa several years back that befuddled the photoanalytical people: there

Trees, People, and the Food Crunch

was a patch of green in one of the most denuded chunks of Africa. A ground investigation found out that the agricultural ministry of one of these nations had decided to try to salvage some denuded wasteland by putting up simple fences around a large plot to keep out free-roaming cattle and by replanting trees. The difference made by these very simple measures was dramatic enough to turn up on satellite photographs. Needless to say, this simple measure attracted a lot of attention.

2. The rape of the Amazonian forests is well underway, thanks to some irresponsible policies of Brazilian interior ministries that have encouraged thousands of poor settlers to settle the Qmazon by farming it. The first casualty of farming preparations is — you guessed it — the trees on the site. But when Amazonian tree cover is destroyed, the soils — which are composed of a clay called laterite — become as hard as concrete due to chemical changes that are set in motion when these soils are exposed to sunlight. A laterized soil cannot be brought back into trees or anything other than low-grade grasses — and there are millions of acres of laterized soil being created every year in the Amazon basin.

3. The world's many development agencies have now awakened to the realization that without tree cover and sustainable watershed, there is no hope for assuring water supplies to Third-World farmers. The water either runs off and destroys irrigation systems downstream from the watershed through siltation, or it erodes the fragile mountain soils that are the first and most important means of slowing down the precipitation cycle on its eventual drainage path to the sea. The importance of reforesting the Himalayan watersheds in particular has been recognized by special international conferences devoted to Himalayan ecology. The same attention is now being devoted — very late in the game — to the Sahel and to countries in Northern Africa. For example, the slow march of the Sahara northward to the Mediterranean coastline is now being recognized by the government of Algeria, for one, as being controllable only through massive reforestation programs. Algeria has called out its military forces to mount this reforestation campaign, which is now second in size only to the reforestation activity of mainland China. But there are very few Third-World governments that are thinking on the ecological scale of these two nations.

4. In the United States, there is a lot of concern over illegal Mexican immigration. In the spring of 1977, a National Security Council study on U.S.-Mexican relations predicted that as many as 60 million Mexicans could be "dumped" into the U.S. by the year 2000 — which would obviously have to include the ones already here. A lot of Americans, curiously, haven't caught on to the gravity of this crisis: The U.S. is the only rich nation in the world that shares a common border with a developing nation, and Mexico is certainly in that category, despite the artificial GNP-per-capita that its new oil wealth has

given it in international statistical ratings. But what most Americans do not realize is that the people involved in the largest population migration in history are rural poor who can no longer survive in the deforested Mexican hinterlands. Almost all of Mexico's farming areas have been so deforested that the only solution to rural population pressures is either flight to the cities (and Mexico City will be the world's largest city by 2000, according to several studies, with an anticipated population of 30-31 million), or migration into the U.S. Thus, the control of illegal immigration that could transform the American demographic balance is very interestingly linked to rural reforestation.

I'd like to acquaint the B.C. reforestation community with some of the thinking that is being done with regard to LDC (Less-Developed-Country) forestry. First of all, the National Academy of Sciences in Washington, D.C. has a Board on Science and Technology in International Development (BOSTID). The BOSTID office has published a valuable monograph on the Leucanea tree, which is a fast-growing tree that can use marginal land, can provide fuelwood in quantities faster than any other known tree, is suitable for grazing, and can also supply lumber.

Another monograph is devoted to twenty tropical plants or trees which are currently unexploited, but have promising food or fiber value. One of them is an amazing tree called the tamarugo, which is so salt-tolerant that it is planted in the Chilean Atacama Desert by the simple expedient of drilling a hole in solid saltpan 3-4 feet thick and then just dropping a seedling into it. The tamarugo can be grazed by sheep at herd densities approaching those of the best pastures in the temperate zones of the world. But more important is the fact that salt-tolerant trees like the tamarugo can be used to rehabilitate millions of acres of irrigated land that have been ruined by salt buildup.

This is a frightening problem in nations like Egypt, that are already experiencing an ominous salinization of their water supplies. It also accounts for the fact much of that Iraq — the former "Fertile Crescent" — is a white wasteland, thanks to over-irrigation. Salinization is also causing problems between Mexico and the U.S., since the Mexicans have to irrigate with Colorado River water that is so salty after its use in southwestern and California farms that Mexican farmers can't touch it. (To solve that little problem, by the way, the U.S. has built one of the world's largest desalinization plants in Yuma, Arizona — and try to figure out the energy budget for that operation!) The tamarugo may well be the only plant or tree that can grow in such saline soils — and thus the introduction of tamarugo and the gradual rehabilitation of ruined farmland through "tree-grazing" could be a very interesting solution to some serious ecological problems.

Secondly, U.S. private organizations like Worldwatch and Overseas Development Council are picking up a lot of political clout. Erik Ekholm, who has worked with both groups, published what is probably the first popular book ever written on the subject of

deforestation and erosion in LDC's — his book *Losing Ground* (Norton, N.Y. 1975) is still the best written on the subject, and everyone in reforestation should get a copy. Believe me, you'll never look at a tree the same way again, even though you may have planted thousands of them. But what is even more interesting is the fact that Denis Hayer, a 34-year-old former eco-activist who was one of the original organizers of Earthday in 1970, has moved from World watch to head the most important solar-energy office in the U.S.: the Solar Energy Research Institute (SERI) in Boulder, Colorado, whose first-year funding is around \$400 million. Hayes has written extensively on energy supplies for rural LDC areas, and has been a prie advocate of solar energy as one means of relieving the pressures on surviving forests in wood-poor nations. There has thus occurred an intriguing political fusion between solar-energy enthusiasts and development activists. The United Nations Food and Agricultural Organization is also devoting more attention to reforestation activities in LDC's, as is Robert MacNamara's World Bank. These are but several examples of the new thinking in the "development community" on the subject of reforestation.

Nevertheless, these efforts are just a tiny fraction of what people like Borgstrom and Ekholm feel are needed. The most important reforestation work to be done is in three critical zones: the Himalayas, where it is going to be the single most urgent activity around; the Sahelian region of central-northern Africa, where there will exist a requirement for trees and ground cover that are very conservative on water use and have deep root structures; and in Central America and Mexico. Mainland China also is a prime candidate, but that government's commitment to reforestation is unquestioned — even though the effectiveness of the Chinese campaign is uncertain, particularly after the ravages of the "Great Proletarian Cultural Revolution" some 10 years ago, which decimated the ranks of China's forestry and farming experts.

2. Aerial reforestation may not make such sense in B.C., which doesn't have the terrain for it. But it makes lots of sense in other parts of the world When

one looks at the total airlift or air cargo capacity available in the world, there is a lot of unused capacity, even though air-cargo operations are picking up a lot of the slack. For example, the Boeing Company is now approaching the rollout of its 4000th commercial airliner — and there are more that have been made by McDonnell Douglas, by Lockheed, and by European manufacturers. There are probably enough of these on the surplus or "overage" market that they could be acquired for peanuts and flown on the reforestation missions I've described above. I feel that the B.C. treeplanting community should start taking an interest in really big operations from the air. Even though the writer is very much a novice when it comes to the subject of aerial reforestation, he can't help but feel that the global requirement for tree-planting is so enormous that labor-intensive operations just can't hack it, and that aerial operations may be the only way to go. I should also note that there is enough sensor technology that is on the open market that it would be easy to rig up sensors that could tell a pilot or crew member of such aircraft where there is a rocky spot or one that doesn't have the right kind of soil for the species on board. Satellite photos already can be made for a whole array of sensing requirements: e.g. for ground moisture, soil types and covers, vegetation types, etc. These "maps" can be translated into the appropriate flight path for such aircraft.

3. Although I'm not an expert in aerial reforestation, I am probably correct in saying that volume on the plane will be far more important than the plane's carrying capacity: seedlings, after all, don't weigh a lot, but they take up lots of space. Standard aircraft could not carry enough seedlings to begin to pay off — even though it is probable that all of these aerial operations will have real problems anyway in paying entirely for themselves, given the costs in jet fuel, etc. But by happy coincidence, it turns out that there are air-cargo outfits like Guppy Airfreighters that specialize in taking planes like old turboprops and giving them huge swollen cargo holds for carrying large but lightweight equipment. (Thus their designation as a "Guppy".) Guppies and Super-guppies have been used to ferry stages of the Saturn 1-C rocket to Cape

Kennedy, and are also being used to carry low-density cargos. There is a whole technology available already on the private market for modifying standard long-fuselage aircraft for surplus jet aircraft or even old turboprops. At any rate, someone should be taking a look at this sort of stuff, particularly its application to really massive aerial reforestation or reseeding operations.

The Canadian International Development Agency (CIDA) is one of the most innovative on the international scene. It is pushing appropriate technology (AID). There is also a specialist named Dr. Joseph Barnea at the UN (I believe that he may be with a UN agency, either UNITAR or UNIDO). Barnea organized a major international conference on synthetic fuels that was held — very appropriately — in Edmonton this past summer, and is one of the really valuable iconoclasts that can be found at the United Nations. He is also one with strong views on Third World energy supplies. Even though specialists like Barnea haven't, to my knowledge, been associated with topics like reforestation of LDC watersheds, nevertheless they are valuable people to contact because of their strong views on directing rich-nation research. This absence of strong R & D directed to LDC requirements is a very serious problem. For example, in work to LDC requirements. The area of tropical or arid-area reforestation there is so much that has to be done that we are only at the first stages or research. The BOSTID monograph mentioned earlier, for example, is careful to note that there are many industrial or food crops (and trees) that it hasn't even addressed, and that its list of 20 is only meant to be very preliminary and to encourage mapping out the potential of many other species. In all, tree-planters should start thinking in bigger terms than just planting trees, as there are some fascinating food or industrial crops that could probably be seeded from the air, with appropriate nursery and capsulation techniques.

5. But the big thing that B.C. treeplanters have going for them is that they are probably the most efficient planters on the world forestry scene. They are recognized by the provincial forestry department, which is a



Trees, People, and the Food Crunch

credential that is quite transferable once these treeplanters want to move on to bigger and better things. These guys have shown that they can work efficiently under conditions that would discourage conventional operators, and they have probably taken labor-intensive tree-planting as far as it can go. The next step is for them to start acquiring an international exposure: which means becoming aware of what is going on in their unique area internationally, on the one hand, and learning where they themselves can contribute, on the other. One of the achievements of this treeplanting community is its painfully acquired expertise in logistics: travelling light and fast, which makes it possible for them to operate on a scale and at cost levels that more conventional tree planters could not afford. While they are certainly not unique in this respect — certainly there are Chinese crews that could work every bit as hard, given the right trucks, tools, nurseries, etc. — nevertheless they are very probably the world's best treeplanters and should not be hesitant in trading on that credential.

To wrap this piece up: I think there is too much — way too much — of a mentality in B.C. that sees forests as inexhaustible, and that does not worry about the waste of millions of tons of highly concentrated biomass. (If anyone were ever interested in biomass

energy, by the way, he would quickly find that the only biomass that lends itself to really efficient collection economics and collection-energy costs is wood products. The tonnages that are available in a concentrated but natural form through wood-residue, collection and upgrading are unique. Try to figure out how much crop residue over how much surface area one would have to collect to approach the tonnage available in a single large tree, if you want some interesting figure.

Again, as I said earlier, this mentality doesn't recognize the ethical problems inherent in the rich-nation "wood cartel" that draws so much angry fire from specialists like Dr. George Borgstrom. In fact, rather than encouraging the conservation of wood on a global scale, the Canadian forest-products industry has just succeeded in convincing the Japanese — probably the most wood-conservative industrial society today — to modify their building codes to encourage the use of more wood. Certainly, this is very attractive and lucrative in the short-term — but it is comparable to a hypothetical conspiracy in the 1950's between Arab oil sheikhs and Detroit to produce the huge guzzlers that have already wasted so much irreplaceable hydrocarbon energy. From the perspective of the global wood and fiber balance, the type of misguided activism that will create Japanese "wood guzzlers" and others like them is tragic and stupid. It can only encourage the further "cartelization" of wood

consumption by the world's rich nations.

The community of treeplanters in B.C. probably is more exposed to the idiocies and the moral pathologies of this attitude than anyone else in the world. It is doubtful that any other "rich-country" logging industry approaches the waste found in B.C. — although the Soviets, on second thought, could probably compete in this arena, if their other industrial idiocies are to be believed. The tonnages of perfectly useful junk wood that are left to rot on B.C. slopes are incredible — even though the rest of the world is desperately short of wood. Is there not some way of collecting and upgrading this wood residue in such a way that it could be used for, say, strand-oriented plywood (which is a technology originally developed for LDC's that makes pretty good plywood out of junk species and even crop residues like straw)?

Would it be possible to decentralize wood processing technologies — e.g. making use of wood-chip briquettes or even railroad ties out of highly compressed wood — that would permit this junk or residual wood left at logging sites to be salvaged? Under normal economic conditions, the costs of transporting this kind of wood would rule out any but the higher-payoff wood products. But if it can be upgraded on site, wouldn't this wood be available for the lower-priced ends of the export market? For example, several retired railroad employees in Washington state have developed a technology for

making a very good railroad ties out of chipped-up soap ties — and their technique for binding wood particles under high pressure produces a tie with much longer life, lower cost, and a bearing strength better than even a concrete tie (which takes a lot more energy and cost to make). This same kind of "lower-end" technology should be developed in the B.C. forest-product industry as a means for getting more of their production to poor nations that really need it, rather than catering to the Japanese middle class and its new taste for wood-wasting housing styles.

For starters, I think the B.C. treeplanting community should become more activist in Third World politics — not in the posturing sense that so easily slides into self-righteousness, but in a serious and professional way. Contacts should be established with organizations like Cida, preferably as a joint effort with B.C. Forest Services and, possibly, with one or two big companies. Secondly, treeplanters should start working the "NGO circuit". An NGO is a Non-Governmental Organization, and they have done some of the most creative stuff in development assistance. There are hundreds of them: Worldwatch is one, so is CARE, Caritas, International Red Cross, VITA (Volunteers in Technical Assistance), etc. (A whole list has been published and is available from the author.) NGO's are well represented at international conferences like the Rome Food Conference in 1974, and have

earned a lot of respect and clout. Thirdly, United Nations activities or agencies like the FAO (Food and Agricultural Organization), plus UN specialists like Barnea, are valuable contacts. There are also agricultural cooperatives that have their own international-assistance and consultant programs and these would be useful to contact. The "mecca" for all of these outfits is New York and Washington, D.C., but the assistance of governmental or provincial agencies (CIDA or BCFS) would be very useful even if one restricted oneself to Ottawa. For starters, I would recommend that interested PRWA folks get hold of the books by Borgstrom and Ekholm mentioned earlier, as well as all of the publications put out by World watch and Overseas Development Council in Washington, D.C. The last two have been forcing more international attention to the need for reforestation work and "fuel plantations" in wood-poor nations and acquaintance with their material would be useful.

In conclusion, it is time for you treeplanting types to stop being provincial — literally. Don't hesitate to use your credentials as planters, because there is no doubt that you deserve them. If you guys are tops in B.C., you're very probably ahead of everybody in comparable areas of the U.S. Northwest states, or Scandinavia or Russia, or any other area of the world that grows and processes lots of conifers. And don't be hesitant to trade on that kind of performance.

What's with the White Pine?

By JIM SMITH

Blister rust — that's what! Like Smallpox, Dutch Elm disease and Chestnut blight it's a disease imported from Europe. And it's rendered the five needle pines a deadly blow. Where once they were the pride of all pines in North America for their quality and vigorous growth they now struggle to survive.

So how does blister rust work? It alternates between five needle pines and its alternative hosts, currants and gooseberries (*Ribes* spp). Infection takes place through pine needles in the fall. Although woody tissues are invaded the following spring, at least three years are required for the fungus to produce spores. In the spring of the third or fourth year, yellow blisters break through the back of the branch or stem and cankers develop in these areas. The blisters contain the spring spores which are capable of infecting only *ribes*. Approximately ten days after the infection of the *Ribes* spore development starts on leaves and continues throughout the summer.

These summer spores reinfect *Ribes* thus intensifying the disease on this host. In the fall, other spores are produced on the *Ribes* that carry the disease back to the pine thereby completing the life cycle. So the next time you spread that homemade currant jam on your morning toast; lament for the White Pine.

Well, can anything be done to

save the White Pine? Foresters have tried several schemes over the years. The most outlandish program was run by the U.S. Forest Service in the fifties and early sixties. They spent perhaps millions of dollars trying to eradicate *Ribes* from the whole of the Pacific Northwest! Blister rust crews went whacking and chopping their way through the mountains trying to kill every single gooseberry and currant bush. Can you imagine?

At the same time geneticists began a program of breeding rust resistant pine. They were fairly successful in producing seedlings that are resistant. Generally fifty per cent of the trees produced are rust free. But it takes years for resistant seed orchards to begin producing in large quantities. Planting stock is now slowly becoming available in Idaho and there's a long waiting list for the seedlings.

Other foresters began looking at natural stands for an answer. They discovered that trees that were resistant in a stand that had heavy rust mortality would produce up to twenty per cent rust resistant seedlings when pollinated naturally. The result has been management that removes only severely infected or dead trees and leaves the healthier trees to reproduce. If the leave trees are average seed producers, each tree will produce 335 established seedlings over a five year regeneration period, and if 25

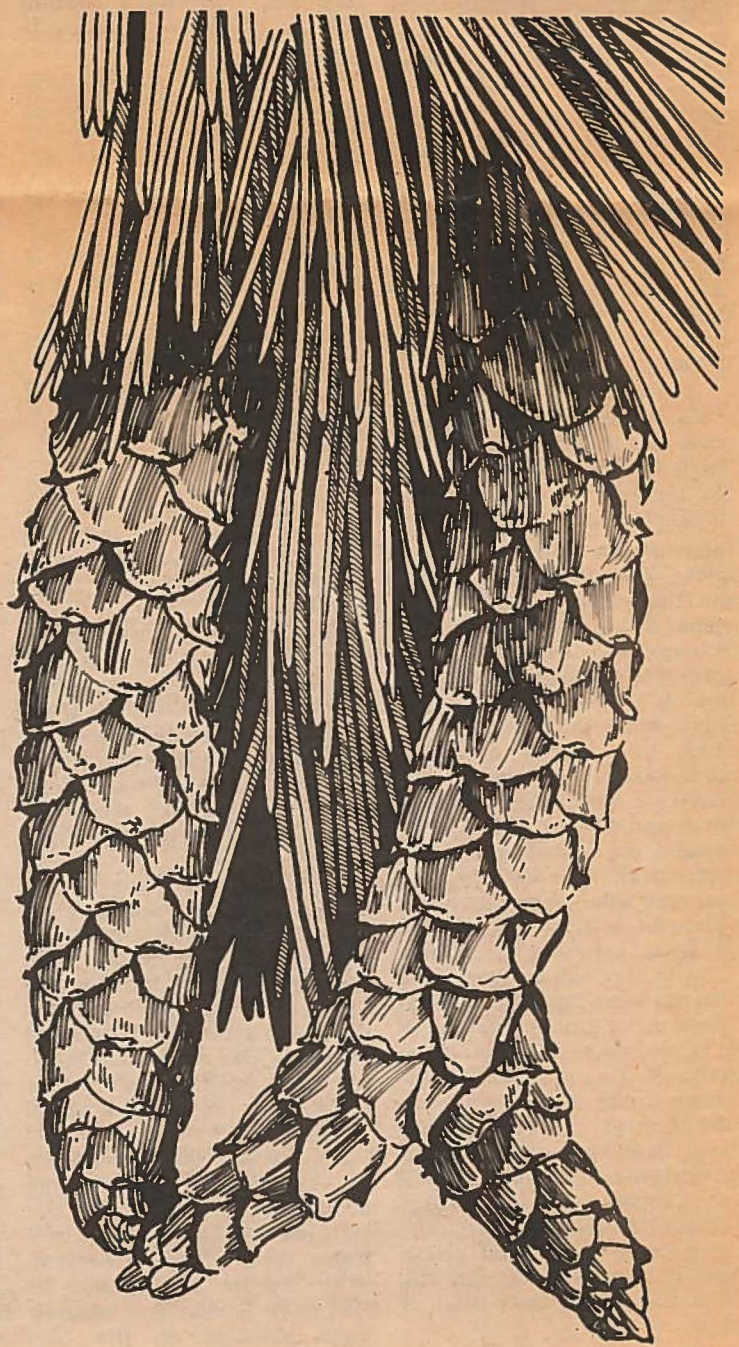
white pine seed trees remain per hectare the new stand (8375 trees per hectare) can suffer 80 per cent blister rust mortality and still be considered an established stand (1675 trees per hectare).

Genetics claim they don't want to eliminate blister rust susceptible trees from the stands. If that were possible they fear a mutation in the rust that might infect the presently resistant trees. Seems like they're using some foresight.

Hope for the White Pine? Looks like it — but like most things in forestry it takes many years for real results.

1. Common Tree Disease of British Columbia; by R. F. Foster, G.W. Wallis: Canadian

Western white pine



A Beginner's Guide to the Gentle Art of Juvenile Spacing

By JOHN BETTS

Juvenile spacing. It's also known as tree thinning and pre-commercial thinning. Basically it involves sawing or whacking or squirting through dense stands of young timber eliminating the vast majority of the trees and leaving the healthier ones at regularly spaced intervals. The theory behind spacing is based on the simple principle that once the competition is eliminated the crop trees that are left will 'release' and grow into a harvestable, mature forest sooner.

Spacing has been practiced in the U.S. for some time and on the B.C. coast since the mid-sixties. The B.C. government became involved in 1974 and by 1977 twenty-five-thousand acres were spaced. The figure has increased each year since and once the interior regional districts have completed their inventory studies, juvenile spacing will probably become the fastest growing silviculture activity in B.C.

If you want to add a little carnage to your forest work repertoire, spacing may be just for you.

There are three basic forms of spacing. There is mechanical thinning using chainsaws or brush saws. There is chemical thinning using pesticides and the 'hack and squirt' method of application. And there are various hand tools used including in some cases just pulling the trees up by their roots.

Primarily mechanical thinning is the most popular and particularly the chainsaw is the most common tool. This fact alone, that thinning is basically chainsaw work, is probably an excellent reason for not going spacing. But if you want to kill trees for fun and profit than you must come to grips, literally, with the chainsaw. However, before we discuss these little beasts of silviculture burden lets begin by discussing how not to lose your shirt in juvenile spacing and then go on to advise on how not to lose any of the rest of you.

HOW TO VIEW

It's an established fact that you'll never get rich working. You'll do even worse if you don't bid properly so therefore the viewing is of critical importance. There is one simple rule to follow. View the whole project site thoroughly. Bring your friends and crew and traverse a section of the site each. It's even worth it to go back and view the area on your own, if you can. Every dense thicket should be found, the number of snags you'll have to fall noted, the heavily windfelled areas discovered and the open spaces checked out before you commence work. Remember, you and your crew will be covering every square meter of the contract and the fewer surprises the better.

Try to view the contract on a man day basis thinking in terms of how many days it will take to do it, not how many acres there are to do. Do not pay much attention to the density statistics (the number of stems-hectare). Statistics on average density can be misleading. If you must pay any attention at all to statistics find out the range in density, i.e. the thickest to the least dense. This is a more valid statistic from the contractor's point of view.

What do you look for while viewing? You look for the perfect thinning stand. The more the stand falls short of this non-existent ideal the more work there'll be.

The actual cutting of a tree takes only a few seconds. It's moving from stump to stump or stem to stem that takes time. Therefore the less hindered your movements are the better. The perfect stand has no dense understory, no brush, no small cedar or hemlock saplings that have to be cut and that get in your way. This kind of stand is tedious and difficult to work through and frequently throws the chain off your bar, slowing production even more.

The ideal stand is composed of trees whose crowns aren't all locked together and are of a size that can be easily directed with a shove if necessary when they are felled. Deciduous trees and large dominant firs or pines can hang up the trees you are falling if they have wide lateral branches. Fighting the hangups and jackpots created in this situation is time and energy consuming.

On the perfect site the ground should be clear of old windfalls and it should slope gently. It should be inhabited by trees that are soft and seldom dull the teeth of the saw and the trees should be free of lower limbs that poke you in the face.

Most important the perfect site has very few trees on it.

The work involves continual cutting. Much of the time spent in brushy portions may be spent just snipping off small stems. Everything coniferous higher than your knees (in most cases) must be cut below the lowest live limb and no stump can exceed 12 inches in height.

The trees must also be completely off the stump with no hinges. Seldom is it necessary to undercut the trees but occasionally a technique of quickly slashing the lean side and undercutting the tree gives a hingeless stump and some control of the direction of the fall. You seldom fall a tree since they aren't that big but nevertheless all the principles of alling apply, both the hazards and techniques although the technique is somewhat abbreviated.

HOW TO BID

How much can you do in a day? This is the obvious question and the answer depends on many things. Experience is of invaluable assistance here, however if you lack it, you'll have to use your imagination. Past experience slashing and clearing will be of some use but spacing involves leaving trees which not only get in the way but require some concentration as well. The novice will waste most of his time choosing trees and trying to keep up the right density.

An acre is one chain by ten chains (66' x 660'). An ice arena is usually around two-fifths of an acre. A Canadian football field contains one acre between the touchline and the opponents thirty-five-yard line. An acre full of trees is a big area and is much harder to work through than a rugby pitch full of two hundred pound louts.

Depending on the terrain there are experienced thinners who average an acre a day. There are some who do two and a half times this, a whole hectare, daily. But for the beginner its best to be modest and estimate your abilities on the con-



Demara,

servative side. A half acre per day is not bad for beginners in steady going.

The perfect physique for thinning seems to be someone who's built low to the ground and sho's head, neck and shoulders all have roughly the same width. Even if you're not of this perfect build but have determination you'll eventually get in shape for the work and your production will improve accordingly.

Some professional thinners actually train for the work. And why not? Athletes do and they don't work near as hard.

Whatever you do don't undersell yourself on the bid. Match your bid to your present ability and remember you are providing a full service. A good thinner is certainly worth as much as a good faller therefore it's not unreasonable to expect equivalent wages. Plus you are supplying food, fuel, transportation, lodging, saws, etc. so add on the overhead accordingly. Bid prices lately seem to range from \$300 to \$600 per hectare depending on the difficulty of the job. If it's your first attempt try and find a small contract which will require only a few workers and a few weeks work. This way if you blow the bid and realize you weren't smarter than all the others you underbid, you at least can finish the job and keep your shirt. The knowledge you gain will be invaluable, the money you make will pay for the saws and you'll know how to go spacing in the future if you still want to.

HOW TO DO IT

First read the contract carefully, it provides a pretty good general description of what's expected. However the contract has some fairly lethal clauses in it so make sure you have a good idea what the Forest Officer in charge really wants. If the two of you have a good understanding you shouldn't have to refer to the contract during the course of the projects completion.

Now that you've assessed the checker for his bias you must check the stand for its lean. Take into consideration what direction exposure you have, the slope of the land if any and the prevailing winds. All these factors will influence which way

the trees will naturally fall. You'll soon know if your working against the lean.

Organize the crew so that each man cuts a comfortable swath a tree length behind the other. Fall any snags as you come to them and use a partner to watch the tops if the snags are particularly dangerous looking. Work methodically and systematically. Angle the face you are working on to best accommodate the lean. Don't fight the trees that hangup on the leave trees right away. You can in most cases fall trees on them and knock them down. Don't cut yourself into corners or pockets with no place to drop your trees. Remain alert, do most of your cutting on your most efficient side and think a little about how the trees ahead of you will fall. Most important get the density right the first time. There is no second chance if you overcut and reworking an area is dangerous and time consuming because the slash is almost impossible to walk on.

Good thinners develop a form of spacing radar that allows them to space the trees practically without looking at them. This 'feel' for the proper leave trees and density comes with practise but in the beginning make your own plot rope (a length of cord equivalent to the plots radius with a ball tied on one end) and do your own density plots.

If you are not working on a profit sharing basis than the foreman can go ahead and ribbon the project site into acre sized swaths.



EQUIPMENT

It's not unusual for experienced highball thinners to have half a dozen saws all in various states of running order. Every serious thinner should have at least one back up saw and the organized crew should all use the same make of saw. It's inefficient to waste time looking for parts and trying to do repairs on the site.

There are dozens of excellent saws on the market today, suitable for thinning. Basically what you want is a high revving, powerful light saw. One that really screams. A good anti-vibe system and adjustable chain oiler are considered by some to be indispensable. You needn't spend money on the most expensive saw available since all the best engineering in the world may not survive or may be superfluous in the flurry of abuse that thinning inflicts on your saw. By the same comparison a cheap saw is just that and may cost you more in the long run.

The Stihl 020 is a light reliable saw but it is definitely the smallest size to consider. The Jonsereds 491 is well built and inexpensive. The Husquvarna 162 has been used by Skookum Reforestation and they recommend it. Many of the Scandinavian thinners on the coast use Partner chainsaws including one model which features a handwarmer which if you thin in the snow is not as much of a frill as it may sound.

A short bar is best, being long ones get lost in the brush and you

GUIDE TO THE GENTLE ART OF JUVENILE SPACING

never know where the tip is.

An interesting chainsaw attachment for thinning is the bowbar. It's used a lot in the States but few are used for spacing in B.C. The dog located on the ballooned tip of the bar allows the cutting to be done on the reinforced tip. Once the teeth are into the tree the saw draws itself in against the dog and cuts through the tree. If you are careful not to cut all the way through the tree you can leave one hand on the throttle and use your free hand to push the tree. It also reduces how much bending over you have to do. The bowbar can comfortably cut anything up to the size of the diameter of the tip and with some ingenuity can cut bigger trees. The bowbar comes in various sizes. The one pictured on this page is made by General Chain Bar Company, Box 23333, 7320 S.W. Bonita Road, Ligard, Oregon, 97273, U.S.

The together spacer is a complete unit carrying everything he needs with him; even his lunch. His equipment includes a bar wrench, a chain file to round out the dents on his teeth periodically, a carburetor adjustment screwdriver for tune ups and a raker file to clean off his drive links should they get burred if he throws a chain. An extra spark plug, some starter cord and any other portable spare parts will come handy as well. The idea is to make as few trips across the slash to the truck or camp as possible.

Although Worker's Compensation doesn't approve of it there is no more sensible way to manage fuel and chain oil than for the thinner to wear it on a belt in durable plastic bottles with metal caps. Leaving fuel back in the slash is ridiculous and hiding it ahead of you is not always successful.

Wear as much safety equipment as possible. If you're not convinced about the necessity of

adequate protection spend a day in the Campbell River Hospital Emergency Ward. It's a popular spot for thinners. Injury is a statistical inevitability considering the nature of spacing work. Most accidents are cuts to the hands and legs. Some are curiously disfiguring, most are painful and almost all are preventable. A professional crew on the cost that spaces year round has one serious injury per year.

The chainsaw kickback is the most common source of serious injury. However the trees themselves can kickback and up end and sweep and these can be equally as hazardous.

You need a hard hat with hearing protection. The ear muffs help to hold the hard hat in place. Working without a hard hat will only prove how soft your head is. Screen masks are advisable and what little visibility you lose you gain in not getting whacked in the eye. Faller's pants are essential and so are steel-toed caulk boots. The pads do stop the teeth and those nylon mesh fallers gloves will work to a lesser degree. Each man should carry a whistle and a pressure bandage. Someone should be an experienced first aid attendant on the crew.

The W.C.B. Fallers and Buckers handbook is recommended reading for spacers as well.

Buying all the safety equipment will probably cost over one hundred and fifty dollars but its worth it.

This is by no means a definitive guide to thinning. It provides a few general guidelines but nothing will replace experience as an instructor. For those who are experienced and would like to exchange more specific information, the Newsletter will publish reports on saws, equipment, technique, contract change proposals and any other discussion relating to juvenile spacing.

the bidding game



start

The rules of the bidding may seem hard enough to abide by during the best of times. The following statistics, compiled by the PRWA, may make some wonder if the game is worth playing at all. Then again they're just statistics aren't they?

—In 1975 the total basic payment to contractors less contravention charges and deductions divided by the number of trees planted gave the average price per tree as 11.7c.

—In 1978 the average price per tree was 13.7c approximately a 16 per cent increase over three years.

—In 1975 a 10 per cent human error factor was allowed to the quality percentage to give the contractor the benefit of the doubt.

—In 1978 only 5 per cent human error factor was allowed

—In 1975 10 per cent excess planting was allowed

—In 1975 the percentage was halved for excess planting. i.e. 5 per cent.



—Research into our history and archives section indicate that planting guidelines and control mechanism were less demanding and more leniently applied in 1975.

—However in 1978 things have tightened up considerably, reflected in the UPSAT penalty system and stringent application of quality planting regulations. Things are a lot more strict and the price has gone up two cents since '75.

—The consumer price index between 1975 and 1976 was 7.5 per cent, between '76 and '77 it was 8 per cent, between '77 and '78 it was 9 per cent.

—Contract overhead costs have increased 33 per cent from 1975 to 1978.

—In January 1975 green 2x4 fir cost \$100-1000 bd. ft.

—In January 1978 the same wood cost twice as much.

—In 1978 lumber production in volume was down ten per cent from 1977 while gross dollar sales exported increased 25 per cent.

—In January 1975 Canadian money was at par with American.

—In January 1975 an American dollar cost \$1.14 Canadian.

—In January 1975 .00343 dollars buy one yen, the currency of the lumber buyer with the greatest appetite.

—In the same month of 1978 a yen costs .00597 dollars.



—The price of gold increases as confidence in the economy weakens. In the fall of 1979 the price of gold increases wildly.

—OPEC, just having raised the price of oil to twenty dollars a barrel, is planning to meet again in the fall to determine a new increase.

—Inflation is projected to increase to 13 per cent in 1979.

—The Ministry of Forests has allotted forty million dollars to silviculture for 1980. The budget for silviculture will also be increased under Section 88 of the New Forest Act, which provides full compensation for licensees for designated silvicultural activities.

—Contestants in the bidding game are increasing.



finished



Fungicide Report

PRELIMINARY LITERATURE SEARCH ON FUNGICIDES

This is a report of a literature search on two fungicides, Captan and Benlate. The literature search is still in progress, but I've seen most of the relevant information. I've reviewed approximately 150 articles on the toxicity, mutagenicity, teratogenicity, carcinogenicity, residue degradation and half-life of Captan and Benlate in the environment. (See the accompanying glossary.) Only the most important articles are cited here.

CAPTAN

Captan is a powerful protectant fungicide that has been used commercially on a large scale for nearly thirty years. It is used on a wide variety of fruits and vegetables to prevent mold during storage and transit. It is also used in paints, soaps, paper, leather and plaster to prevent mold, 1,2 It is used on the seedlings as a spray to prevent mold in the nursery bed and during storage.

Captan is one of the safest pesticides with respect to oral toxicity. Typical LD50 values are from 8,400 to 12,000 mg/kg of body weight for rats. Other

animals seem to have a similar high tolerance to captan, although cattle and sheep are killed by much smaller doses 2

Captan is rapidly destroyed in both the gut and the blood. The half-life of Captan in whole human blood is 54 sec. 1,2 It does not appear to accumulate in tissues of higher animals. 2

Captan also appears to break down rapidly in the environment. The half-life in the soil ranges from one day to two weeks.2 It has a half-life in water at room temperature of about 2.5 hours, and the breakdown products, in or out of higher organisms, seem to be rapidly destroyed as well.1

MUTAGENICITY

A major literature review by the U.S. Environmental Protection Agency (EPA) in 1975 concludes the following on the mutagenicity of Captan: (1) Captan is mutagenic in a number of micro-organisms. In some it is a strong mutagen, in others it is weak. In other micro-organisms it is not mutagenic. (2) In mammalian cell tissue cultures, chromosome breaks are induced by Captan. (Chromosome breaks may result in mutations). (3) In *Drosophila* (fruit flies), feeding them Captan does not produce

mutations. (It is concluded that the fungicide was inactivated before it could reach the germ cells). (4) In mice and rats, Captan in the diet or injected intraperitoneally does not produce mutagenic effects.2

Most of the literature since the 1975 EPA report confirm these conclusions on mutagenicity. One study, however, demonstrated mutagenic effects in mice. This was an EPA study in which captan was fed to both rats and mice. At 5,000 ppm for eight consecutive weeks, captan produced a heritable mutagenic effect in F1 generation male mice. They could not get an effect in rats.4

There are two things one might suspect from this data. Either heritable mutagenic effects in humans are possible, but rare, or effects might not occur at all, primarily due to the size of our organism and the rapid breakdown of captan in the gut. This question has not been resolved. If captan can get to our germ cells, it will probably cause mutations.

Another important review of captan appeared in 1975. This report by B.A. Bridges examines the data of a previous study and concludes that captan is mutagenic in rats and mice at a



Fungicide Report

dose level of 50 mg/kg-day. In a mouse, this is about 500 ppm. Despite the fact that the effect of captan is modest when compared to other strong mutagens, one if forced to conclude that captan carries a risk of producing mutations in humans. A threshold response (no-effect level) has not been demonstrated. Finally, the EPA review 2 cites a study done on workers at a captan formulation plant. No chromosome aberrations could be attributed to captan.

CARCINOGENICITY

Bridges (1975)¹ concludes on the question of carcinogenicity! "There is no acceptable evidence that captan is carcinogenic but more work is needed to prove or disprove this, particularly in situations (e.g. after inhalation) where scavenging by thiols in the gut lumen is excluded." p.31.

The EPA review 2 reports that captan did not produce tumors in mice at 560 ppm in the diet for 18 months.

Another EPA study⁵ fed massive amounts of captan (8,000 and 16,000 ppm) to mice for 80 weeks. The mice developed tumors in the duodenum. They couldn't get an effect in rats. So captan is a mild carcinogen in the gut. These results are in conflict with many other experiments. The differences may be related to the strain of mice, dosages or thoroughness of the search for tumors.

Two further possibilities could explain the lack of carcinogenicity in the chronic feeding studies with captan. First, the compound may be destroyed during the preparation and storage of the diets by compounds in the diets, or much more probably, in the stomach. The second possibility is that even if the fungicide is absorbed from the gut, it is rapidly destroyed by the blood. Because of the extreme instability of captan in the intact organism, the results of the chronic feeding studies have usually been negative.⁶

One place that captan may not be broken down rapidly is in the lungs. To my knowledge, no research on the carcinogenic potential of captan in the lungs of live organisms has been done.

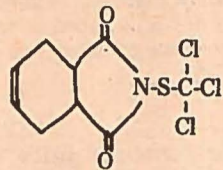
I understand that there is a study that demonstrates carcinogenic effects of captan in mice at 10 ppm. I have not however, been able to find this reference.

TERATOGENICITY

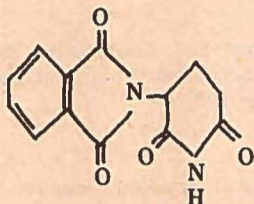
When considering the question of teratogenicity, one immediately compares captan with the proven teratogen thalidomide.

The structures of the two chemicals are similar and there is a possibility that they have a

similar function. Chemicals with similar structures often have similar effects. It is also possible to change the position of just one hydrogen atom or create a mirror image of the molecule and have a substance with totally different characteristics.



captan



thalidomide
(after Bridges
(1975))

Bridges (op. cit) concludes: "In summary one is led to conclude that the evidence that captan and its analogues are teratogens is probably as good as that for thalidomide, taking one species with another and admitting the lack of primate (monkey) data. It must be emphasized, however, that fairly massive doses are necessary to detect any effect and that repeated application may tend to result in death and resorption of the embryo with consequent loss of the teratogenic effect. In man exposure to these fungicides is generally at a low level and is chronic. The likelihood is probably remote that these agents cause a significant addition to the normal rate of production of embryonic abnormalities, but in situations where these substances are handled in significant quantities it would seem prudent to restrict the workers involved to women past reproductive age and men." p. 231

"Significant quantities" is left undefined.

The EPA review 2 cites a study with monkeys in which no teratogenic effects were observed. As Bridges suggests above, fetal mortality was high at the high dose level.

CONTACT DERMATITIS

There is evidence that you can become hypersensitive to captan and develop contact dermatitis.^{7,8} Women are more susceptible than men.⁸

BENLATE

Benlate, or benomyl, was introduced as a fungicide in 1968 and is used extensively in agriculture. The oral toxicity is very low. Various researchers

give LD50's of 9,000 to 10,000 mg/kg. 9,10,11. The Handbook for Pesticide Applicators 3 gives a LD50 of 5,000.

Benlate is mutagenic in some micro-organisms but not in others 12, 13, 14. In tissue cultures of various mammalian species, benlate causes various mutagenic effects.¹⁵ In rats and in blood cultures from workers in a formulating plant, no chromosomal aberrations due to benlate were found.¹⁶ In a three generation rat study with benlate, no mutagenic effects were noted.¹⁷

In the study cited above¹⁷ no teratogenic effects were observed. In another study⁹ benlate produced teratogenic effects in very high doses (10,000 mg/kg). In chronic 11-12 month feeding tests on rats, benlate produced teratogenic effects.¹⁸ Like captan, no threshold response has been demonstrated, so one must assume that any dose carries some teratogenic potential.

Carcinogenicity has only been demonstrated in the presence of sodium nitrite.^{19,20}

The half-life of benlate is 3-6 months on turf and 6-12 months on soil.²¹ I have no data for the half-life in water or tissues.

Apparently, benlate is metabolized and excreted and does not accumulate in body tissues. I have not seen the literature which supports this claim.

Benlate has caused contact dermatitis in fungicide applicators²² and others.^{23,24}

CONCLUSIONS

In plain language, what this means to me, is that the chance of getting poisoned by these fungicides is practically nil, the chance of getting cancer is remote, and the chance that someone will have a deformed baby or retarded grandchildren from planting trees is very small. There exists a somewhat larger possibility of contact dermatitis.

These conclusions are based on the available evidence. Some experiments have not been carried out in the way one might wish, other experiments have not been carried out at all. The possibility exists that captan is a much stronger teratogen, mutagen and carcinogen in humans than anyone expects. We simply don't know. Especially suspect is captan's structural relationship to thalidomide. If you are pregnant, it would be prudent to avoid exposure to captan. The carcinogenic effect on the lungs is unknown. Finally, remember that there is no no-effect dosage. Even a trace of these substances will increase ones chances of getting cancer or having a deformed baby. The question for me has become, not what are my chances of being effected, but do I want to play the game at all?

Considering that I'm playing with genetic material, do I have a right to play?

It is quite possible that by the time we get the trees to plant, there is little or no residue on them. For this reason I'm involved in setting up an experiment with the Surrey Nursery to test for pesticide residues.

As chemical mutagens go, captan and benlate are probably among the least dangerous. Tobacco, for example, is strongly mutagenic and definitely reaches the germ cells. It is an infamous carcinogen, significantly contributes to lung and heart disease and is physically addicting. It is a serious teratogen as well. The list of chemical mutagens we are exposed to is long. The cumulative effect may be catastrophic. If you don't know about genetic toxicity and its potential for the human gene pool, The CoEvolution Quarterly, No. 21, Spring 1979, is a good place to start.

Finally, to clear up some misinformation. "Teratogenic (brain)" doesn't mean anything to me. The word we are looking for is "teratogenic" and has no particular reference to the brain. I have found no evidence that captan in small doses "can kill" or that it is excreted from the body slowly. It is apparently excreted or metabolized very rapidly. There is no thalidomide in captan. Neither captan nor benlate are serious environmental pollutants. They do not accumulate in the food chain or body. Finally, to say that these fungicides are safer than table salt (LD50 equals 3,320) or aspirin (LD50 equals 1,750) is misleading. The potential danger lies not in their acute toxicity, but in their chronic and mutagenic effects. In'm continuing this

I'm continuing this investigation and invite anyone with relevant information or observations to contact me at the address below. Anyone who is willing to spend some time in the UBC library can greatly assist in further investigations on the various pesticides used on the seedlings and planting and thinning sites. Scientific training is not necessary, but accuracy and thoroughness are. HELP!

Ted Davis

No. 102 — 3371 Chesterfield
North Vancouver, B.C.
V7N 3N2
986-4649

GLOSSARY

Acute toxicity — Poisoning from a single dose of a chemical.

Carcinogen — A substance capable of producing cancer.

Carcinogenic — Cancer producing.

Chromosomal aberrations — An irregularity of the chromosomes which may alter

the course of development of the fetus.

Contact dermatitis — An acute allergic inflammation of the skin caused by contact of a substance.

Duodenum — The first part of the small intestine.

EPA — Environmental Protection Agency (U.S. government).

F1 generation — The first generation after the parents.

Fetal — Pertaining to the developing young while in the uterus.

Fungicide — A pesticide used to treat or prevent fungus diseases.

Germ cells — The reproductive cells. The eggs and the sperm.

Half-life — The time in which on half of the substance is destroyed. Usually used to describe the time in which the radioactivity of an isotope is reduced by one-half.

Herbicide — A pesticide used to kill weeds.

Heritable — Capable of being passed on to the offspring.

Insecticide — A pesticide used for killing insects.

Intraperitoneally — Within the peritoneal cavity. The peritoneal cavity is the space between the abdominal wall and the internal organs.

LD50 — Used to indicate acute toxicity, it is the amount of a substance expressed as mg/kg of body weight of an animal necessary to kill 50 per cent of such animals.

Metabolize — To transform a substance by physical and chemical processes in the body.

Micro-organism — A microscopic organism. Bacteria, yeast, molds, etc. Mutagen — A substance capable of producing mutations.

Mutagenic — Mutation producing.

Mutation — A genetic change which produce offspring that have different characteristics from their parents.

Oral toxicity — Pertaining to the poisoning caused by a substance taken by mouth.

Pesticide — A substance used for killing or controlling plants and animals that are considered pests. Fungicides, herbicides, insecticides, etc. are pesticides.

ppm — Parts per million.

Residue — The amount of a chemical that is left at the time of analysis.

Teratogen — A substance capable of producing deformities in unborn animals.

Teratogenic — Capable of producing deformities in unborn animals.

Thalidomide — An infamous teratogen used as a sedative prescribed to mothers because of its apparent absence of side effects. It caused over 7,000 babies to be born with various degrees of limb malformation.

Threshold response — Refers to the theory that there must be a certain amount of a substance present before that substance has any effect. A no-effect level.

classifieds etc.

A NEW REALM IN TREEPLANTING — custom made comfortable bags. — Rainbow colors, sturdy herculite, one year guarantee, padded belts and shoulder straps, specially made for all

kinds of planting. — order now before the spring rush.

Sustained Yield
Ed Walter
Box 93
Crawford Bay
V0B 1E0 227-9461

One treeplanter cook presented this interesting observation. She noticed that the mice and other assorted rodents that frequented their camp's root cellar only ate the organic vegetables that were stored there. This proves that fungicides and other preservatives definitely increase the shelf life of food products.

