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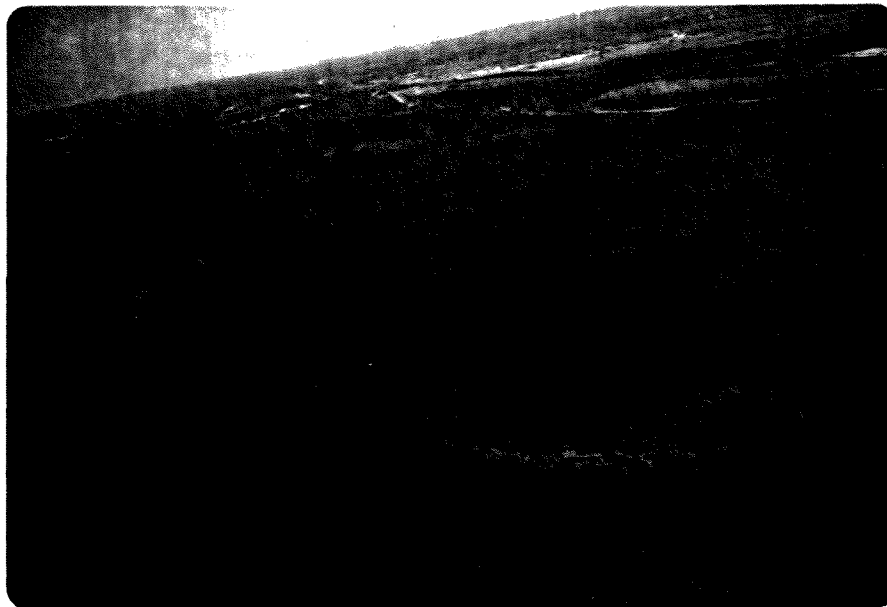
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FILE REPORT NOR-Y-21

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EXAMINATION OF A DAMAGED FOREST AREA NEAR THE BLUE RIDGE
GAS PROCESSING PLANT, ALBERTA.



Northern Forest Research Centre
Environment Canada
Edmonton

EXAMINATION OF A DAMAGED FOREST AREA NEAR THE
BLUE RIDGE GAS PROCESSING PLANT, ALBERTA

by

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NORTHERN FOREST RESEARCH CENTRE

CANADIAN FORESTRY SERVICE

ENVIRONMENT CANADA

EDMONTON, ALBERTA

RESULTS AND CONCLUSIONS

1. The damage to the forest was caused by a severe hail storm which occurred in August of 1971.
2. The damage to the forest occurred in a narrow band approximately 8 miles long, from northwest of Whitecourt through the townsite and beyond to the southeast (cover photo and photo #1).
3. The damage to the lodgepole pine and other tree species ranged in intensity from very light branch flagging which occurred around the perimeter of the affected area (photo #2) to severe branch and main stem damage which occurred within the affected area (photo #3). Further, a number of dead trees were scattered throughout the damaged area.

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BACKGROUND

The examination was conducted in response to a request by the head of the air pollution control branch, Division of Pollution Control, Dept. of the Environment, Government of Alberta. The request specifically referred to a damaged forest area around the town of Whitecourt, near the Blue Ridge gas processing plant. Concerns were expressed about the possibility of air pollutants being responsible for the damage.

DIAGNOSIS OF THE CAUSAL AGENT

The trees in the damaged forest area were examined for evidences of destructive biological agents, such as primary pathogens and insects.

No evidences of such agents, in the abundances necessary to cause the damages, were found. Further, no symptoms which would indicate air pollution damages were found on the trees or other plants, including the lichens and bryophytes.

However, lesions typical of those caused by hailstones, were common on the branches (photo #4) and the main stems (photo #5) of the tree species throughout the damaged area. In the most heavily damaged forest area, bark lesions were extremely numerous and resulted in the flagging of all branches on most of the trees (photo #6). Scattered cases of tree mortality also occurred in this area.

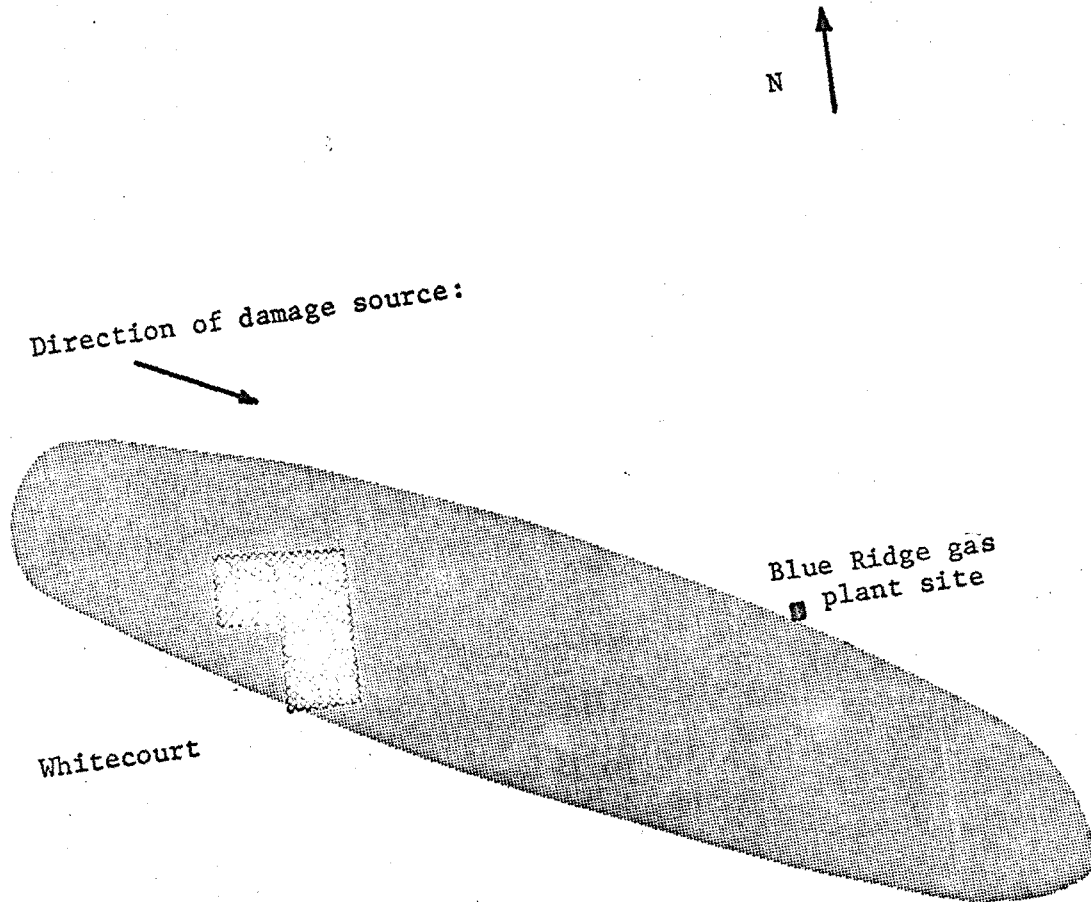
A build up of needles and broken branches was found beneath the canopies of the damaged trees, which indicated mechanical stripping, also typical of severe hail damage (photo #7).

In some cases trees growing closely together were physically protected from the damaging agent and displayed no lesions or other damages. It was observed that the foliar damage, was always severest on the northwestern side of the trees (photo #8), indicating that the damaging agent had come from that direction.

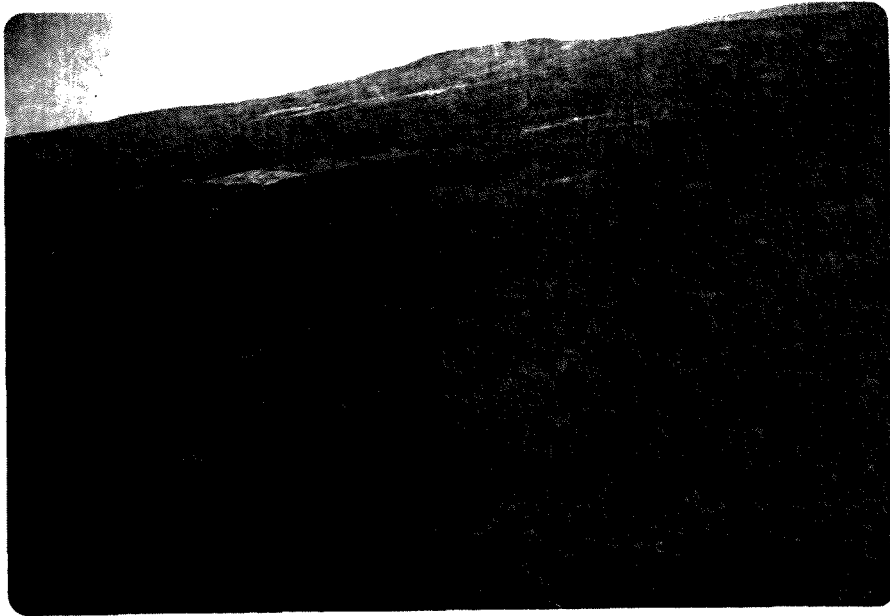
The broadleaf trees in the damaged area displayed badly lesioned dead branches that were completely defoliated and showed no evidences of bearing leaves this summer, while the branches that remained alive were foliated with normal healthy leaves (photo #2 and 3). The conifers retained both the live and dead needles of last year's foliage. None of the needles produced this year were damaged. These facts establish that the damage occurred in 1971 after completion of the conifer needle fushing (usually mid July).

Regarding hail, the district forester verified that a particularly severe hail storm, containing large hailstones, had passed through the Whitecourt townsite from a northwesterly direction in August of 1971. The evidence observed in the forest and presented above on: 1) the damage symptoms 2) the directional nature of the damage and 3) the time of damage occurrence; correlates with this hailstorm. The directionality of the damage further demonstrates that the Blue Ridge gas plant did not emmit air pollutants responsible for the damage, because the plant is located on the north eastern edge of the damaged forest area and the source of the damage originated from the north west (see diagram #1 on next page).

Diagram #1.



#1



#1. The damaged forest to the southeast of Whitecourt. More of the damaged forest is shown in the cover photo.

#2



#2. The perimeter of the damaged area - note the light flagging of the lodgepole pine, and the green foliage of the broad leaf trees (aspen and black poplar).

#3



#3. The severely damaged trees inside the affected area - note the green foliage on the live aspen in the foreground.

#4



#4. Typical hailstone lesions (note arrows) found to be common on tree branches in the damaged area.

#5



#5. Typical hailstone lesions common on the main stems of the damaged trees.

#6



#6. The damaged area contained heavily flagged trees, a few which were dead.

#7



#7. Broken branches and needles such as shown above were commonly found beneath the damaged conifers.

#8



#8. The severely damaged "northwest" side of some spruce trees in the area. The severest damage always occurred on the northwest side of the trees.