



PACIFIC REGION TECHNICAL NOTES

81-016

June 22, 1981

DEVELOPMENT OF A DRYING INDEX FOR HAYING AND OTHER HARVESTING OPERATIONS IN BRITISH COLUMBIA

Bob Mackenzie, Senior Meteorologist
Pacific Weather Centre, Vancouver

INTRODUCTION

During the summer months requests for forecasts related to drying conditions for haying and harvesting are received by weather offices within B.C. and by the Pacific Weather Centre (PWC) in Vancouver. This summer an extended outlook directed at haying operations in the Okanagan is being issued daily in the late afternoon by PWC. This outlook is for days 4, 5, and 6, with respect to the day of issue, with emphasis on temperature trend and precipitation probability. Days 2 and 3 are covered by the afternoon public forecast (i.e. tomorrow's forecast and the outlook for the following day). These items are used as guidance by the staff of the Kelowna Weather Office in the preparation of a weather bulletin for agricultural interests in the Okanagan.

For the short range, a specific forecast of drying conditions has been used in other parts of Canada (e.g. P.E.I. and Ontario). A practice has been to incorporate a drying index for today and tomorrow with a daily agricultural weather forecast. On a seasonal basis it is proposed to issue a drying index for selected areas in B.C.

LATENT EVAPORATION AND DRYING INDEX

Latent evaporation (LE) is a measure of the drying ability of the air. It refers to the volume of water that evaporates from a Bellani Atmometer or its modified version. In the form of a drying index, latent evaporation is stated in cubic centimetres (CC) per day and is expressed by the following equation.

- (1) Drying index = constant
- + contribution to LE of maximum temperature
 - + contribution to LE of temperature range
 - + contribution to LE of wind speed
 - + contribution to LE of sunshine amount
 - + contribution to LE of vapour pressure deficit

.../2

in a more specific form;

$$(2) \text{ Drying index (cc per day)} = -22.3 + .61 T_{\max} + .95 (T_{\max} - T_{\min}) + .78WS + 3(10-N) + 1.77 \text{ VPD}$$

Where: T_{\max} and T_{\min} are in celsius degrees

WS = Average wind speed for day (midnight to midnight) in KMH

N = Average cloud amount for day (sunrise to sunset)

VPD = Vapour pressure deficit in millibars, i.e., difference between saturation vapour pressure at the day's mean temperature and saturation vapour pressure at the day's mean dew point temperature.

DRYING INDEX FOR B.C.

PWC's operation development unit has written a program that translates equation (2) into computer terminology. With the input of maximum temperature, minimum temperature, average wind speed, average cloud amount and mean dew point temperature by the forecaster, the program will produce a spot forecast of drying index. In presenting it to farmers, subjective terms may be applied to ranges of numerical values of the index. The following tentative criteria are suggested.

<u>DESCRIPTIVE TERM</u>	<u>DRYING INDEX (cc/day)</u>	<u>DAYTIME RAIN (mm)</u>
Unfavourable	0-10	and/or less than 1.5
Poor	11-20	and less than 1.5
Fair	21-40	and less than 1.5
Good	41-XX	and less than 1.5
Excellent	YY or more	and less than 1.5

Where XX = 70 and YY = 71 for the southern interior, and XX = 55 and YY = 56 for southern Vancouver Island, the Lower Fraser Valley and the Central Interior.

Drying indices were calculated using climatological means for selected points in B.C. the results are tabulated below.

MEAN DAILY DRYING INDEX FOR MONTH OF

	<u>JUNE</u>	<u>JULY</u>	<u>AUGUST</u>	<u>SEPTEMBER</u>
Penticton Airport	46	60	52	40
Kamloops Airport	46	60	57	40
Prince George Airport	34	35	32	25
Abbotsford Airport	27	37	34	30
Victoria Airport	27	37	33	28

FINAL REMARKS

Initially a daily drying index will be issued in the afternoon for the Okanagan. It will be valid for the "next day" and may be considered as a companion to the extended outlook. Feedback from farmers with respect to the usefulness of the index will be desirable. It is hoped that the concerned weather offices will solicit and log farmers' comments and forward them to the PWC. Further calibration of the index will probably be necessary while evaporation measurements will be used in its verification.