



PACIFIC REGION TECHNICAL NOTES

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Frost Advisory for Okanagan Grape
and Vegetable Growers - Fall 1978

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INTRODUCTION:

The frost warning advisory is issued daily for the Grape and vegetable growers of the Okanagan Valley during September and October. During this period harvesting is underway, and the crops are susceptible to early fall frosts which may drastically affect the quality and quantity of the produce. The purpose of the advisory, is to advise the agriculturists of expected freezing temperatures during the crucial harvest period.

THE OBSERVING NETWORK: (see Fig. 1)

Prior to the start of the frost warning season, a number of observing sites were located through out the grape growing areas of the Okanagan Valley. Two sites were set up in the Oliver area. The north Oliver site ^{was} in the vineyard of Covert Farms which is near 1500 ft. A.S.L. The south Oliver site was in the Blue Sage Vineyard near the Okanagan river and at 1000 ft. A.S.L. The Osoyoos site was in the Osoyoos Vineyard located on the west bench, northwest of Osoyoos and at 1300 ft. A.S.L. The Westbank site was in a vineyard close to the Okanagan Lake at 1200 ft. A.S.L.

Instrumentation at these sites consisted of a stevenson screen, minimum, and grass minimum thermometers. Thermographs and grass minimum thermometers were put into service at the Kelowna and Penticton airports. The field sites were set up jointly by the Kelowna and Penticton WO^s. Daily readings of screen and grass minimums were collected from the field sites and relayed to the frost forecaster at P.W.C. each morning. Data from the central Okanagan was collected by the Kelowna WO, while the Penticton WO handled the southern areas. The network of stations gave a pretty good coverage of the grape and

vegetable growing districts from the lower valley land to the upper benches.

THE ADVISORY AND DISSEMINATION:

The frost advisory was issued from the Pacific Weather Center near 3p.m. each day. A sample of the advisory is included in figure 2. It consisted of a discussion of weather conditions expected for the coming night, with emphasis on cloud cover, winds, radiation cooling, and prospect of frost. An attempt was usually made to predict the time temperatures would reach freezing and how widespread the frost would be both at the grass and at screen levels.

This frost warning was incorporated into evening radio weather programs at the Penticton and Kelowna WOs, which are carried on radio stations throughout the valley. The advisory was also included in the evening TV weather show on CHBC and carried on the Code-A-Phone at the Kelowna WO.

SUMMARY OF THE SEASON:

Crop developement progressed normally during the summer, but came to a standstill about mid August. At that time unseasonably cold and wet weather set in and continued to September 24th. By mid September grape growers were faced with the prospects of an unmarketable crop if the weather pattern continued into October. The sugar content was very low due to the cool temperatures and lack of sunshine, and below marketable percentage levels. Tomato crops also suffered heavy losses due to wetness. Rainfalls were double normal in nearly all parts of the valley in August and September. (See Fig. 3) The miracle the grape growers were looking for in the form of warmer sunnier weather began the last week of September. The sunshine during October far exceeded the normal and while temperatures were not excessively warm, the crop reached the sugar levels required for marketing. A sugar content of 18% is required for most varieties.

During September, grass minimums dropped below freezing at the Penticton and Kelowna Airports a number of times, but only on the 19th in the vineyards where South Oliver and Osoyoos reported -1° . The first freezing temperatures at screen level occurred on October 12, 13, 14, and 15th with the lowest reading of -2° at the South Oliver vineyard. The frost damage during this period was to the canopy foliage and not to the fruit. Severe and damaging frost occurred on the 25 and 26th of October with readings as low as -7° at screen level in some vineyards, but the grape harvest was completed in most areas by that time except for some of the more hardy varieties. Most varieties of grapes will withstand temperatures down to -4° for short periods, depending on the sugar content. The lower the sugar content the more prone the grapes are to frost damage. A temperature of -6° would cause severe damage to most varieties.

FROST PROTECTION:

Frost protection is carried on by a number of vineyards in the southern Okanagan. Overhead irrigation sprinklers are the most common, and work well with light frosts. A combination of sprinklers and wind machines is used at the Blue Sage vineyard. Three wind machines are located at this site and were used extensively during October.

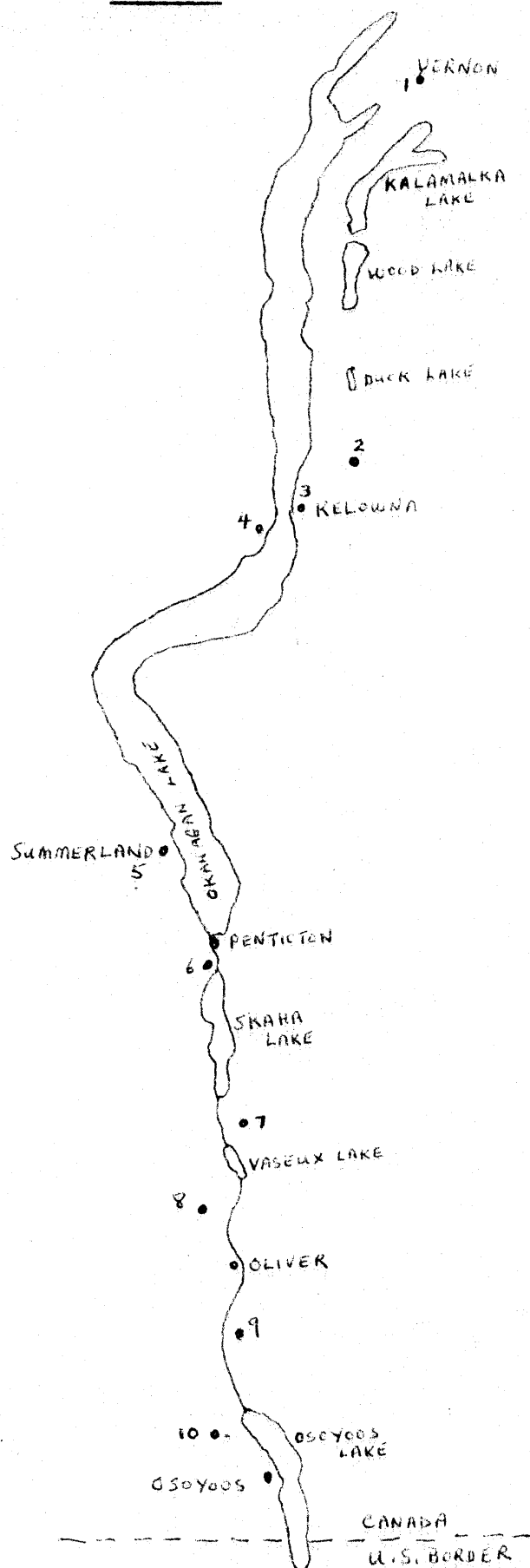
SUMMARY:

The Frost Advisory was advertised well ahead of its beginning with a press release and mention on local radio programs. On October 13th the Penticton WO did a feature on the frost warning on our weekly TV program "Weather Ways" including an interview with the manager of the Blue Sage Vineyard, and a video tape of the vineyard, sprinklers, and wind machines. The following week we had the manager of Sumac Farms on our show talking about the effects of August and September weather on hay and tomato crops.

The Kelowna Weather Office arranged with the Kelowna newspaper "Daily Courier" to carry daily a note indicating possibility of frost and expected low that night.

There were more contacts with growers this year than in previous years, likely due to the adverse weather during most of the fall. John Vielvoye, grape horticulturist for the Okanagan expressed his appreciation for the service and said it is now taken for granted by the growers.

FIGURE 1



LEGEND

<u>Volunteer Stations</u>	<u>Elevation</u> Feet A.S.L.
4. Westbank	1150
8. North Oliver	1500
9. South Oliver	990
7. Vaseux Farm (Non reporting site)	1300
10. Osoyoos Vineyard	1300
<u>A.E.S. Stations</u>	<u>Elevations</u>

1. Vernon	1800
2. Kelowna Airport	1368
3. Kelowna City	1150
5. Summerland	1500
6. Penticton Airport	1129

Figure 2

FROST ADVISORY FOR OKANAGAN GRAPE AND VEGETABLE GROWERS FOR TONIGHT
ISSUED BY ENVIRONMENT CANADA AT 3 PM PDT WEDNESDAY 4 OCTOBER 1978.

STRONG COOLING IS INDICATED FOR THE DISTRICT TONIGHT DUE TO THE
PRESENCE OF CLEAR SKIES AND LIGHT WINDS. PROLONGED GROUND FROST WILL
OCCUR AT MOST VALLEY LOCATIONS AND AT A FEW POINTS ON THE BENCHES.
THE FREEZING TEMPERATURES SHOULD BE REACHED AROUND MIDNIGHT IN THE
COLDER POCKETS. GRASS MINIMUMS ARE EXPECTED TO RANGE FROM MINUS 6
TO PLUS 1. MEANWHILE LIGHT FROST AT SCREEN LEVEL IS PREDICTED FOR
SOME VALLEY SITES WITH MINIMUMS IN THE SCREENS TO RANGE FROM MINUS 1
TO PLUS 4.

FORECAST GRASS MINIMUM TEMPERATURES

KELOWNA AIRPORT M6

PENTICTON AIRPORT M5

END

Figure 3

AUGUST

	RAINFALL/NORMAL		MEAN TEMP. /NORMAL		SUNSHINE/NORMAL.	
VERNON	24.5	33.3	17.8	18.2	249	284
KELOWNA A.	32.8	22.4	17.8	17.5	227	256
SUMMERLAND	40.6	24.4	19.1	20.2	195	282
PENTICTON A.	44.9	22.4	19.1	19.2	205	269
OLIVER	44.2	25.7	19.7	21.4	Msg.	276
OSOYOS	45.0	24.6	19.4	20.9		

SEPTEMBER

VERNON	62.7	34.0	12.3	13.7	127	195
KELOWNA A.	89.5	21.1	12.7	13.2	122	208
SUMMERLAND	36.7	19.1	13.7	15.5	130	201
PENTICTON A.	36.8	18.0	14.0	14.7	140	212
OLIVER	25.1	16.0	14.9	16.6	96	201
OSOYOS	30.3	15.5	15.0	16.2		

OCTOBER

VERNON	25.7	30.0	7.4	7.4	177	119
KELOWNA A.	16.4	26.2	7.4	7.0	177	136
SUMMERLAND	6.4	19.8	8.9	9.4	194	131
PENTICTON A.	2.3	19.8	8.4	8.7	192	153
OLIVER	2.4	20.6	9.3	10.0	193	126
OSOYOS	TR	23.9	9.3	9.7		