WALTER CLORE, Consultant
1317 PATERSON ROAD, PROSSER, WASHINGTON 99350

R. P D.V.

July 22, 1982

Mr. Stephen E. Higgens, Director
Bureau of Alcohol, Tobacco and Firearms
Washington D.C. 10116

Dear Mr. Higgins:

Enclosed is a submitted proposal, maps, accompanying data and references concerning the application for an American Viticulture Area under the provisions of the Treasury decision ATF - 60 and 27 CFR part 9. The proposed viticultural area which involves similar soils and climatic conditions in the State of Washington is to be known as the "COLUMBIA VALLEY".

As the proposed "Columbia Valley" appellation involves a rather large area, wide interest of vineyard and winery personnel in Washington will be involved. A convenient central location for a hearing would be the Red Lion Motel in Pasco, Washington. This motel is adjacent to the main highway US 395 and is less than a mile from the Pasco Airport served by Republic, Western and Horizon Airlines.

When arrangements need to be made for scheduling a hearing, please contact me and/or Mr. Wallace Opdycke, President, Chateau Ste. Michelle, One Stimson Lane, P.O. Box 1976, Woodinville, 98702, Mr. Bill Preston, President, Preston Wine Cellars, Star Route 1, Box 1234, Pasco, 99301, Mr. Mike Wallace, President, Hinzerling Vineyards, 1520 Sheridan Avenue, Prosser, 99350, Mr. Jerry Warren, President, Enological Society of the Pacific Northwest, c/o Department of Rehabilitation Medicine, RJ - 30, University of Washington, Seattle, 98195, Mr. Keith Ellis, Director, Department of Agriculture, State of Washington, Olympia, 98504.

Sincerely,

Walter J. Clore

Walter J. Clore, PhD
Viticulture Consultant

AMERICAN APPELLATION VITICULTURE AREA FOR EASTERN AND SOUTH CENTRAL WASHINGTON

TO BE KNOWN AS —

"COLUMBIA VALLEY"

The appellation conditions of the "Columbia Valley" viticulture area are defined as follows:

150 frost free (32°F) or more growing days;

2,000 or more heat units (daily degrees above a mean of 50°F for April-October) (see Climatic Data and references 7,13,14,20,27,31,41,45);

Elevation not to exceed 2,000 feet;

Area rainfall not to exceed an annual average of 15 inches. (see Exhibit 1 - Map of Annual Precipitation & Climatic Data);

Two or more feet of such soil types as silt loam, fine sandy loam, sandy loam and loamy sands (ref. 25,35,36,37,38,43).

The viticulture area in Washington covers parts or all of the following counties: Klickitat, Yakima, Kittitas, Chelan, Okanogan, Douglas, Ferry, Stevens, Spokane, Lincoln, Grant, Adams, Whitman, Asotin, Garfield, Columbia, Walla Walla, Franklin and Benton. A narrative description of the viticulture boundaries and marked Geological Survey map (scale 1:500,000) is enclosed (Exhibit 2).

This area is distinguished by its broadly undulating or rolling surface, cut by rivers and broken by long sloping basaltic uplifts extending generally in an east-west direction, and a natural lack of native forests (ref. 5,15,18,23,24,25).

The Cascade Range borders the west side of the "Columbia Valley" keeping this area open and barren by intercepting most of the Pacific air moisture (ref. 5,25). On the north, this area is enclosed by the Okanogan Highlands, on the east, by the Greater Spokane Area, and the eastern portion of the high rolling Palouse Prairie. The south side is bordered by the Blue Mountains, Oregon and the Colubmia River. The area surrounding the "Columbia Valley" viticulture area is forested, except for the immediate southside. For these bordering areas, elevations generally exceed 2,000 feet, rainfall exceeds 15 inches annually, the growing season is less than 150 frost free days and heat units fall below 2,000 degrees (see precipitation map anc climatic data).

Within the "Columbia Valley" viticulture area there is a range of elevations from 400 feet to over 3600 feet, rainfall varies from an average of 6.3 to slightly over 26 inches, growing degree days range from less than 1400 to over 3300 and the frost free days can be 140 or less. However, within this viticulture area along the Columbia, Snake and Yakima River Valleys extensive lands with comparable climatic conditions can be found which meet the defined requirements of this viticulture area (ref. 5,17,26,32,34, 39,43,45,46). This is the basis for defining such a large area which extends two degree Latitude (46° to 48°) and nearly over 4° Longitudes (117° to 121°) and proposing to name it "Columbia Valley." (See U.S. Geological Survey Map 1:500,000)

Historical evidence and geographical features: The Lewis and Clark Pacific Expedition in 1804-06 first mapped a broad area involving Washington, Idaho and Oregon as "Columbia Valley" (see Exhibit 3 - Map of Lewis & Clark Track). The term "Columbia Valley" has been used in other publications, such as, Geology of the Grand Coulee (ref. 24), and Grand Coulee and Neighboring Geological Wonders (ref. 15).

"Columbia" is now being used as a brand name by Columbia Wine Cellars, Redmond, Washington. Other have used this name in the past.

The grape is not indigenous to this area, but vines of both vinifera and labrusca type grapes can be found growing throughout the proposed viticulture area (ref. 1,8,6,30,40). The oldest planted vinifera vines still in existence were planted by German emigrants in the Tampico vicinity, west of Union Gap, in 1871. Others were planted in the Kennewick area in 1895 (ref. 9). Unattended vines can still be found near Chelan and Manson, Keller Ferry, the mouth of the Spokane River, Maryhill and the Maryhill museum, Plymouth and the Lewiston-Clarkston area.

Plantings of premium vinifera wine grapes began in the early sixties. Currently there are over 8,000 acres of vinifera grapes grown in Washington including the following major varieties: Merlot, Cabernet Sauvignon, Chardonnay, Chenin Blanc, Sauvignon Blanc, Gewurztraminer, Grenache, White Riesling, Muscat, Semillon and Pinot Noir. All of these acres are included within the boundaries of the Columbia Valley.

Wines were made in Washington prior to Prohibition, but commerical winemaking did not start until the repeal of Prohibition (ref. 1,2,8,12,16,22,29,34,47,48,49). At one time there were as many as 42 bonded wineries in operation making grape, fruit and berry wines (ref. 1,12,34). At present there are 28 bonded wineries (Wash. State Liquor Board) devoted mainly to making premium vinifera grape wines (ref. 3,10,11,22,39,44,47,49).

The early explorers and pioneers have referred to this treeless, undulating semi-arid area as Columbia Valley, Columbia Plain, Great Columbia Plain, Columbia Plateau, Columbia Basin and Inland Empire. This area is described by Freeman & Martin (ref. 15), "as a rather flat, somewhat tilted, deformed triangle measuring 250 air miles along each side, with its apex at the mouth of the Okanogan River in north central Washington, its southern corners in the Deschutes County of eastern Oregon and the Camas Prairie of northern Idaho."

Map 1 in Meinigs book (ref. 25) outlines rather well the "Great Columbia Plain and Some Physical Subregions" as does "Pictorial Landform Map of the State of Washington and Adjacent Parts of Oregon, Idaho and British Columbia" and satellite pictures of this area in color (see Exhibit 4). Notably the periphery of the proposed "Columbia Valley" viticulture appellation closely approximates the circumscribed area marked by 15" or less rainfall (see "Mean Annual Precipitation" map).

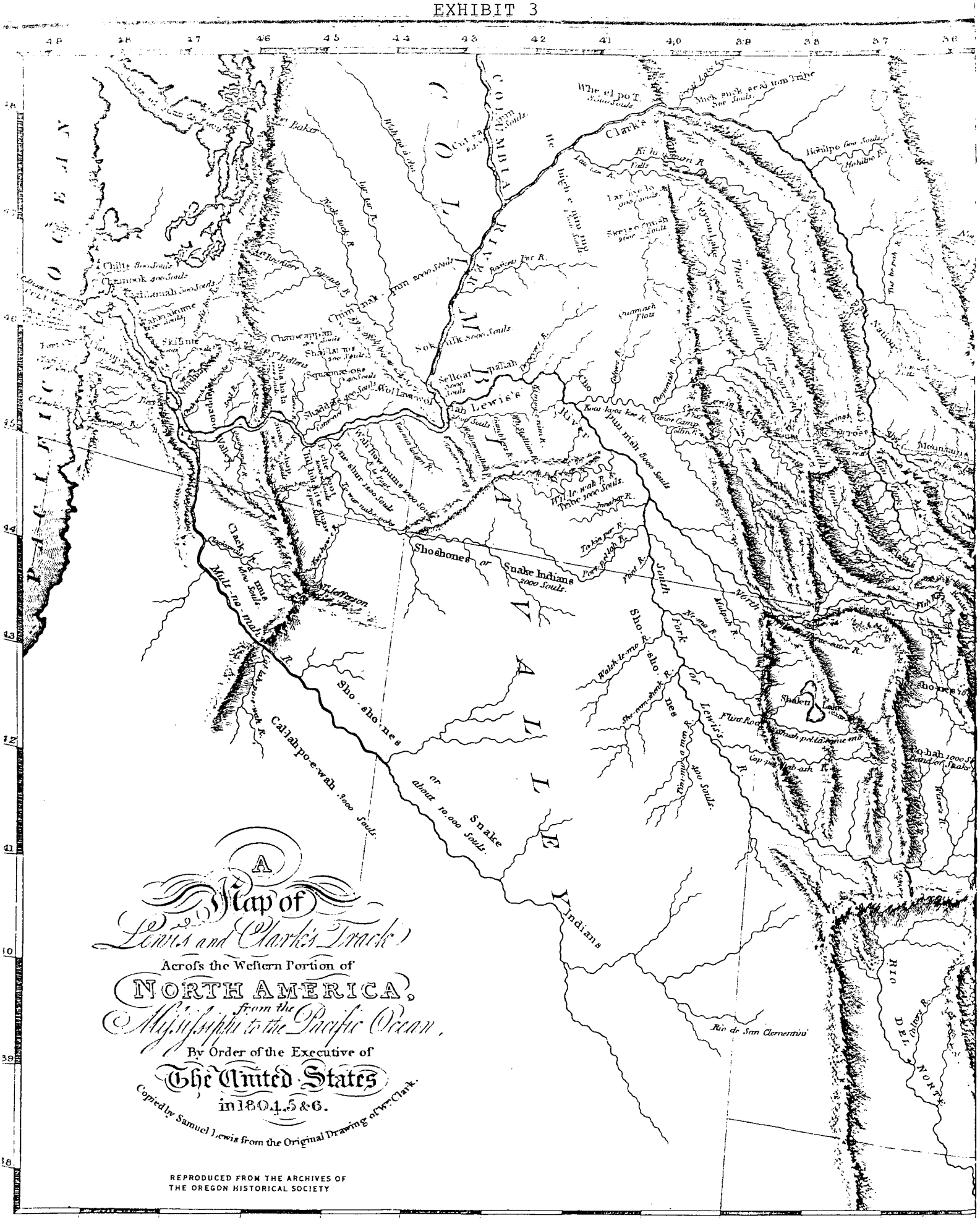
EXHIBIT 1

WASHINGTON CLIMATIC DATA

FOR THE "COLUMBIA VALLEY" APPELLATION

Station	Elevation (ft.)	Latitude	Frost Free Season Days	Annual Precipitation (inches)	Apr-Oct Degree Days	Lowest Occurring Min. Temp. F°
Klickitat, County						
Dallesport	222	45° 37'		13.70	2,817	-25
John Day Dam	186	45° 43'		10.59	3,216	- 2
Goldendale	1,800	45° 49'	128	17.41	1820	-29
Yakima, Co.						
Naches	1,874	46° 39'		8.38	2,391	-15
Yakima	1,064	46° 34'	184	7.86	2,274	-25
Moxee	1,000	46° 35'		7.36	1,992	-23
Wapato	850	46° 26'		7.11	3,124	-27
White Swan	970	46° 23'	137	8.22	2,390	-37
Fort Simcoe	1,300	46° 20'		12.41	2,791	-20
Toppenish	765	46° 22'		5.88	2,267	-32
Sunnyside	747	46° 19'	160	6.90	2,666	-30
Kittitas, Co.						
Ellensburg	1,729	47° 02'	148	8.75	2,127	-31
Cle Elum	1,930	47° 11'	132	22.10	1,678	-33
Grant Co.						
Priest Rapids Dam	460	46° 39'		6.80	3,796	-11
Wahluke	416	46° 39'		6.36	3,920	-23
Smyrna	560	46° 50'		8.39	2,391	-28
Moses Lake	1,208	47° 07'	143	8.10	2,338	-33
Quincy	1,274	47° 13'	160	8.19	2,397	-29
Trinidad	555	47° 13'	189	8.24	3,432	-17
Ephrata	1,259	47° 18'	186	8.42	3,204	-33
Wilson Creek	1,276	47° 25'	130	9.17	2,268	-30
Hartline	1,910	47° 41'	156	10.91	2,360	-19
Grand Coulee Dam	1,700	47° 57'	194	10.66	2,512	
Ruff	1,342	47° 10'	127	9.62	2,391	-31
Chelan Co.						
Wenatchee	1,229	47° 25'	177	9.99	2,818	-21
Dryden	920	47° 32'		16.78		
Leavenworth	1,128	47° 34'	136	23.91	2,145	-26
Plain	1,940	47° 47'	87	25.65	1,381	-31
Chelan	1,120	47° 50'	201	11.23	2,667	-15
Manson						
Okanogan, Co.						
Methow	1,165	48° 08'		12.44	2,360	-37
Brewster	878	48° 06'	175	10.48	2,758	-23
Pateros	825	48° 03'		13.13	3,062	-16
Okanogan	900	48° 22'	168	11.65	2,972	-23
Omak 2NW	850	48° 25'	141	12.44	2,238	-23
Oroville 3NW	1,060	48° 56'	163	11.43	2,543	-19
Nespelem	1,890	48° 08'	128	13.57	2,024	-33
Ferry, Co.						
Inchelium	1,685	48° 19'		17.59	1,839	-26
Laurier	1,644	49° 00'	123	19.26	2,055	-32

Station	Elevation (ft.)	Latitude	Frost Free Season Days	Annual Precipitation (inches)	Apr-Oct Degree Days	Lowest Occurring Min. Temp. F°
Stevens County						
Boulder Road	1,450	48° 50'				
Kettle Falls	1,265	48° 34'		16.12	2,054	-32
Colville	1,635	48° 33'	124	17.67	1,901	-29
Cedonia	2,000	48° 08'		19.43	1,260	-24
Lincoln Co.						
Odessa	1,540	47° 20'	129	10.81		
Sprague	1,925	47° 18'	129	14.70		
Adams, Co.						
Hatton	1,428	46° 46'	135	9.94	2,510	-30
Lind Exp. Station	1,625	47° 00'	143	10.11	2,525	-26
Othello	1,110	46° 50'	151	8.16	2,666	-26
Ritzville	1,825	47° 07'	137	11.67	2,440	
Whitman, Co.						
Colfax 1NW	1,955	46° 53'	121	20.97	2,005	-26
Ewan	1,720	47° 07'		16.32		
La Crosse ESE	1,546	46° 48'	115	14.05	2,365	-30
Asotin, Co.						
Alpowa Ranch	730	46° 25'		10.82	3,156	-17
Clarkston Hts.	1,185	46° 23'	157	13.15	2,605	-18
Garfield, Co.						
Pomeroy	1,810	46° 28'	141	16.58	2,287	-22
Wawawai 2NW	695	46° 39'		18.74	3,310	-10
Columbia, Co.						
Dayton	1,620	46° 19'	163	19.53	2,425	-22
Dayton 5NW	1,710	46° 22'		17.32		
Huntsville	1,400	46° 18'		17.57		
Walla Walla, Co.						
Attalia	360	46° 06'		6.87		
Mill Creek	2,000	46° 01'		39.56		
Mill Creek Dam	1,275	46° 04'		17.61		
Pleasant View	1,650	46° 31'		12.39		
Touchet	443	46° 02'		9.83		-23
Walla Walla FAA	1,185	46° 06'		18.43	2,881	-25
Walla Walla 3W	800	46° 03'	171	15.33	3,031	-25
Walla Walla WBO	949	46° 02'		15.50	3,217	-16
Frankline Co.						
Kahlotus	1,340	46° 36'		10.37		
Mesa	875	46° 36'		7.72		
Pasco	360	46° 13'		7.40		
Connell 4NNW	1,125	46° 14'				
Connell 12SE	1,078	46° 30'		9.44		
Eltopia 7WNW	895	46° 29'		8.47		
Benton Co.						
Hanford	385	46° 35'		6.39	3,308	-23
Kennewick	392	46° 13'	184	7.49	3,181	-23
Kennewick 10SW	1,500	46° 08'		9.93	2,636	-17
McNary Dam	348	45° 57'		7.64	3,247	-22
Mottinger	307	45° 56'		8.34	3,461	-14
Prosser	675	46° 12'		8.53	2,848	-22
Prosser 4NE	840	46° 15'	155	7.77	2,548	-20
Richland 25NNW	733	46° 34'		6.73	3,230	-27



REPRODUCED FROM THE ARCHIVES OF
THE OREGON HISTORICAL SOCIETY

EXHIBIT 4

SATELLITE VIEW OF THE "COLUMBIA VALLEY" APPELLATION

COLUMBIA VALLEY APPELLATION

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Sokol Blosser Winery SB
P.O. Box 199, Blanchard Lane
Dundee, Oregon 97115
(503) 864-3342 or 864-2307

14 September 1982

Mr Charles N. Bacon
Regulations and Procedures Division
Bureau of ATF
1200 Pennsylvania Ave, NW Room 6226
Washington, D.C. 20226

Dear Mr Bacon:

Thank you very much for sending me a copy of the proposal for the Columbia Valley viticultural area. After reviewing the proposal, I have been asked by the Oregon Wine-growers Association, which represents 37 wineries and approximately 125 grape growers in Oregon, to respond to the proposal.

Our position is that with the addition of part of Oregon within the viticultural area, it will be a good and reasonable one.

We have prepared a description of the area we would suggest adding to the viticultural area. It follows the same criteria as in the original proposal and the end points of the boundary join to the points where the other proposal intersect the Columbia River. The rationalle for the boundary, the historical information and the viticultural information are the same as in the other proposal. Grapes are currently grown within the Oregon portion of the viticultural area, and many more acres are planned. A newspaper article on one such planting is attached.

If you wish further information on this, please call on me.

Sincerely,

William R Blosser

cc: Wallace Updycke, Bill Preston, Mike Wallace, Gerry Warren, Alec Bayless, Bill Fuller, Ed Glenn

STATE OF OREGON PORTION OF THE "COLUMBIA VALLEY" VITICULTURE APPELLATION

Continue on the 2,000' elevation topography line east of Walla Walla, Washington into Oregon east of Spoffora south to Bingham Springs (BS); southeast along Umatilla National Forest to Willamette Meridian, then west to Meacham on to Highway 74 and south to Pilot Rock, Nye, Vinson, Lean, Heppner and Ruggs; from Ruggs west on Highway 206 to Eightmile, Condon and Township Line (TSL) nearest Sherman and Gilliam Counties; west on TSL to Erskine; north from Erskine on DesChutes River to Willamette Base Line (WBL); west along WBL to TSL intersect 12 & 13; and from intersect 12 & 13 north to Rowena (which is across from the mouth of the Klickitat River in Washington).

valuable nutrients are lost.

Capital Press July 30, 1982

Morrow growers eye first wine grape crop

By VIRGIL RUPP
For the Capital Press

BOARDMAN, Ore. — Four Boardman residents are looking ahead to October and the harvest of the first commercial wine grapes in Morrow County.

The grapes are being grown under irrigation on 12 acres by Ed and Frances Glenn, Dewey West and Vern Russell.

Eventually the grape growers expect to have vines on 35 acres, producing enough grapes for 20,000 gallons of wine a year.

The harvest this year will be limited to picking from the first vines to be planted, which went into the ground in 1979. About 1.5 tons of grapes will be picked this year, enough for a few hundred gallons of wine.

The vines include Cabernet Sauvignon, Sauvignon Blanc, Semillon, Chenin Blanc, White Riesling and Merlot.

The Boardman entrepreneurs have named their business "La Casa de Vin." A winery that can produce 4,000 gallons a year is expected to be in operation by fall.

When the Boardman winery gets its state license, it will be the first east of Hood River. Oregon's 35 other wineries are located mostly in the Willamette Valley and Southern Oregon.

But the grape-growing potential of the Columbia Basin is winning recognition. At Paterson, Wash., just a few miles from Boardman, a firm named Chateau Ste. Michelle is spending $25 million to build a winery and get grape production going. Other Oregon grape-growing projects are in the works.

Glenn, who grew up on a farm at Lostine in Wallowa County and is now a lawyer, says the Columbia Basin's soils and climate lend themselves to growing of wine grapes. The region is similar in latitude to the Bordeaux area of France, a famed wine producer.

Glenn says the warm days build heavy sugar content and cooler nights keep acid levels high, resulting in a superior wine.

Glenn's wife, Frances, also grew up on a farm, at Umapine, west of Milton-Freewater. She's the chief vine trainer of the new outfit.

Oregon Climatic Data
For the Columbia Valley Appellation

Station	Elevation (ft.)	Latitude	Frost free days	Annual precipitation (inches)	Apr-Oct Degree Days	Lowest occurring Min. Temp. F°	Lowest occurring Min. Temp. C°
Oregon							
Wasco, County							
The Dalles	102	45° 36'	204	14.28	3014	-30	0
Dufur	1330	45° 27'	137	11.91	2070	—	—
Sherman Co.							
Moro	1868	45° 29'	152	11.96	2078	-32	-2
Wasco	1264	45° 35'	164	11.77	2250	—	—
Gilliam Co.							
Arlington	515	45° 43'	187	8.98	3259	-32	-8
Morrow							
Heppner	1950	45° 20'	152	13.65	2040	-30	-6
Umatilla Co.							
Echo	660	45° 45'	191	10.21	—	—	—
Hermiston	624	45° 49'	153	9.02	2951	-31	-0
Milton-Freewater	962	45° 58'	194	13.58	3006	-29	-4
Pendleton	1482	45° 41'	163	13.35	2711	-33	-9
Umatilla	270	45° 55'	188	8.80	3265	-31	-0

Chateau Ste Michelle

Grandview Winery
Post Office Box 580
Grandview, Washington 98930
509/882-3928

March 5, 1982

To whom it may concern:

Ste. Michelle Vintners is pursuing a viticultural appellation for southcentral Washington. Many consumers, especially those outside the state, equate Washington to cool, wet and green, and question its suitability for premium wine production. Our intent is to create a more specific appellation that will allow greater emphasis on the actual geography and climate of the grape growing region.

Dr. Walt Clore is working with us in compiling the historical and climatological data needed for such a proposal to BATF. The critical features of this proposal are 1) a name for the appellation, 2) historical evidence to link the name to the proposed area, 3) historical evidence to tie grape growing to the area, 4) geographical, climatological and/or soil data that demonstrates the uniqueness of the area from surrounding areas, and 5) ability to define the area on U.S. Geological Survey maps.

Our preliminary research indicates that land in vicinity of the Snake and Columbia Rivers and the Yakima Valley should be included. Probable boundaries would be the Columbia Gorge (Dalles) and Cascade foothills to the west, the land in Oregon immediately adjacent to the Columbia River to the south, the Columbia River between Chelan and Grand Coulee to the north, and a line drawn from Grand Coulee to Connell approximating the 1300' topographic line to the east. There would be an arm extending from Connell east along the Snake River to the Idaho border and returning to the Oregon border along the west foothills of the Blue Mountains. This encompasses land with 150 or more frost-free days, 2000 or more Heat Units, and moderate winter temperatures.

Since BATF will request comments and possibly a hearing on this proposal, we would like to hear your comments prior to submitting it. If you have any thoughts on a name for the region, suggestions on boundaries, or historical references about grapes or wines, please send them to me. Since we plan to draw up a rough draft by April and submit the proposal by summer, we would appreciate your prompt response.

Sincerely,

Wade H. Wolfe

Wade H. Wolfe
Viticulturist

Warren W. Aney
Rt 1, Box 1520
La Grande, OR 97850
25 February 1982

Bill Blosser
Sokol Blosser Winery
PO Box 199
Dundee, OR 97115

Methods. I've chosen to use expected 20-year minimum temperatures, frost-free days and April-October degree days as defining climatological variables. These variables were mapped (see enclosed maps).

Since federal regulations appear to require boundaries that can be found on a U.S. Geological Survey (USGS) map, I also included elevation as a variable although I haven't yet mapped this variable. Annual precipitation is also included to round out area descriptions, but it is not used as a defining variable.

My 1974 paper also used 20-year minimum temperatures and frost-free days in the same way that I am now using them. But instead of degree-days, I originally used a potential evapotranspiration index because it corrects for latitudinal differences in day length (which a degree-days type index does not do). But in this application I decided to use degree-days for a number of important reasons:

- A degree-days index is more easily understood by more persons and is more commonly used in American viticultural literature (e.g., Winkler).

- There are several ways for calculating or measuring potential evapotranspiration, each of which can produce different answers with varying accuracy and precision (I used Thornthwaite's index in my 1974 paper because it is one of the oldest and most widely used methods, but it is not the most accurate; the data you sent me is from another method and gives slightly different results than Thornthwaite's index).

- For this study, degree-days is nearly as informative as potential evapotranspiration since there are no great differences in latitude and day-length in the Pacific Northwest, i.e., we are talking about a maximum difference of 7° latitude or about 3% more daylight in the longest day of the year. But degree-days would not work well for comparing Napa Valley (38° latitude) with the Mosel (50°) where there is 11% more daylight in the longest day.

- Potential evapotranspiration indexes are difficult to calculate without a computer.

Results. These environmental variables define the Pacific Northwest's major viticultural regions and subregions as described below. The Cascades Mountain Range divides the Pacific Northwest into two major climatological influences---a moderate, moist coastal areawhere lack of summer ripening heat is the factor determining where vinifera grapes can be successfully grown; and a more severe, dry interior where frost and

winter cold are the determining factors. So vinifera grapes can be and are being grown successfully in a number of areas which I define and describe as follows (see also the enclosed map of viticultural areas):

b. Columbia Basin[a] region. Characterized by low precipitation, hot summers and cold winters. This is that part of the Columbia River drainage east of the Cascades with a frost-free season of at least 160 days.

1. Celilo subregion - along both banks of the Columbia River from Hood River on the west to Arlington[b] on the east.
   - elevation not greater than 150 m (500 ft)
   - expected 20-year minimum no lower than -33°C (-27°F)
   - growing season at least 160 days
   - at least 2000 degree-days

2. Umatilla-Yakima subregion - from Arlington[b] on the Columbia up the Columbia and Yakima valleys to Yakima[b]
   - elevation not greater than 300 m (1000 ft)
   - expected 20-year minimum no lower than -32°C (-26°F)
   - growing season at least 170 days
   - at least 2400 degree-days

3. Wenatchee subregion - Columbia River valley from Wanapum Dam[b] upriver to Wenatchee and Ephrata
   - elevation not greater than 400 m (1300 ft)
   - expected 20-year minimum no lower than -32°C (-26°F)
   - growing season at least 180 days
   - at least 2400 degree-days

4. Nez Perce subregion - Snake River valley from Lower Granite Dam[b] upriver to the Grande Ronde River[b]
   - elevation not greater than 300 m (1000 ft)
   - expected 20-year minimum temperature no lower than -32°C (-26°F)
   - growing season at least 160 days
   - at least 2400 degree-days

Discussion. As I mentioned earlier, vinifera grapes are grown successfully in all these areas but there are a lot of questions about the limits and extent of these areas that will only be answered through trial and experience. Also, there is insufficient climatological information and viticultural experience to adequately predict the suitability of the area along the Columbia River between John Day Dam and Boardman (between the Celilo and Umatilla-Yakima subregions). Lack of such information is also a problem for the Columbia River valley above the mouth of the Yakima River and the Snake River valley below Lewiston.

Some areas such as the Upper Snake are so marginal in one or more climatic factors that it is possible only carefully selected spots with optimal local climates can be reasonable expected to produce dependable viticultural reults. Finally, the very high degree-days reported for some Columbia Basin stations suggests too much summer heat may be a factor to consider in some areas right along the Columbia River (Umatilla-McNary locality with 3265 degree-days, Paterson station with 3411, Priest Rapids Dam with 3680 and Wahluke station with 3920).

The region and subregion names I have chosen are rather tentative and arbitrary at this point, but I did try to use generally accepted and currently used names, favoring Indian related names for the more specific subregions. I believe Willamette and Umpqua are commonly used names by winegrowers in those areas but Siskiyou and Celilo may not be. The latter could be Klickitat-Wasco, the names of two of the principal counties involved (as is the case with Umatilla-Yakima).

I would welcome any additional information or suggestions anyone can provide that will help us in this process. If what you see here is generally acceptable, I'll start refining it and preparing better graphics (for example, I will have to map these areas on standard USGS maps).

Sincerely,

Warren W. Aney

Footnotes:

a/ These names are land form provinces described on page 34ff, Atlas of the Pacific Northwest (Oregon State University Press, 1979)

b/ Geographical limit is not well-defined in terms of viticultural suitability.

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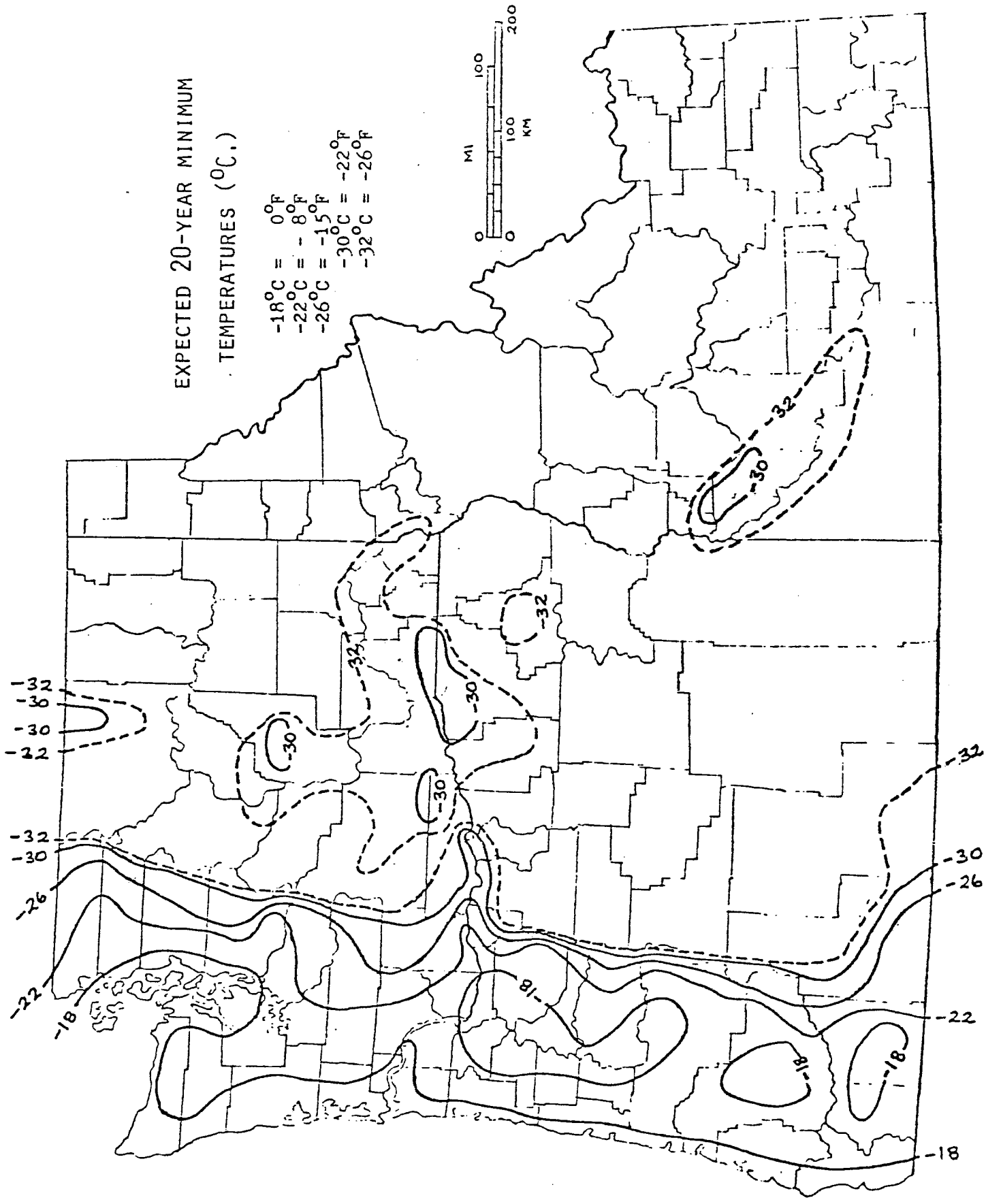
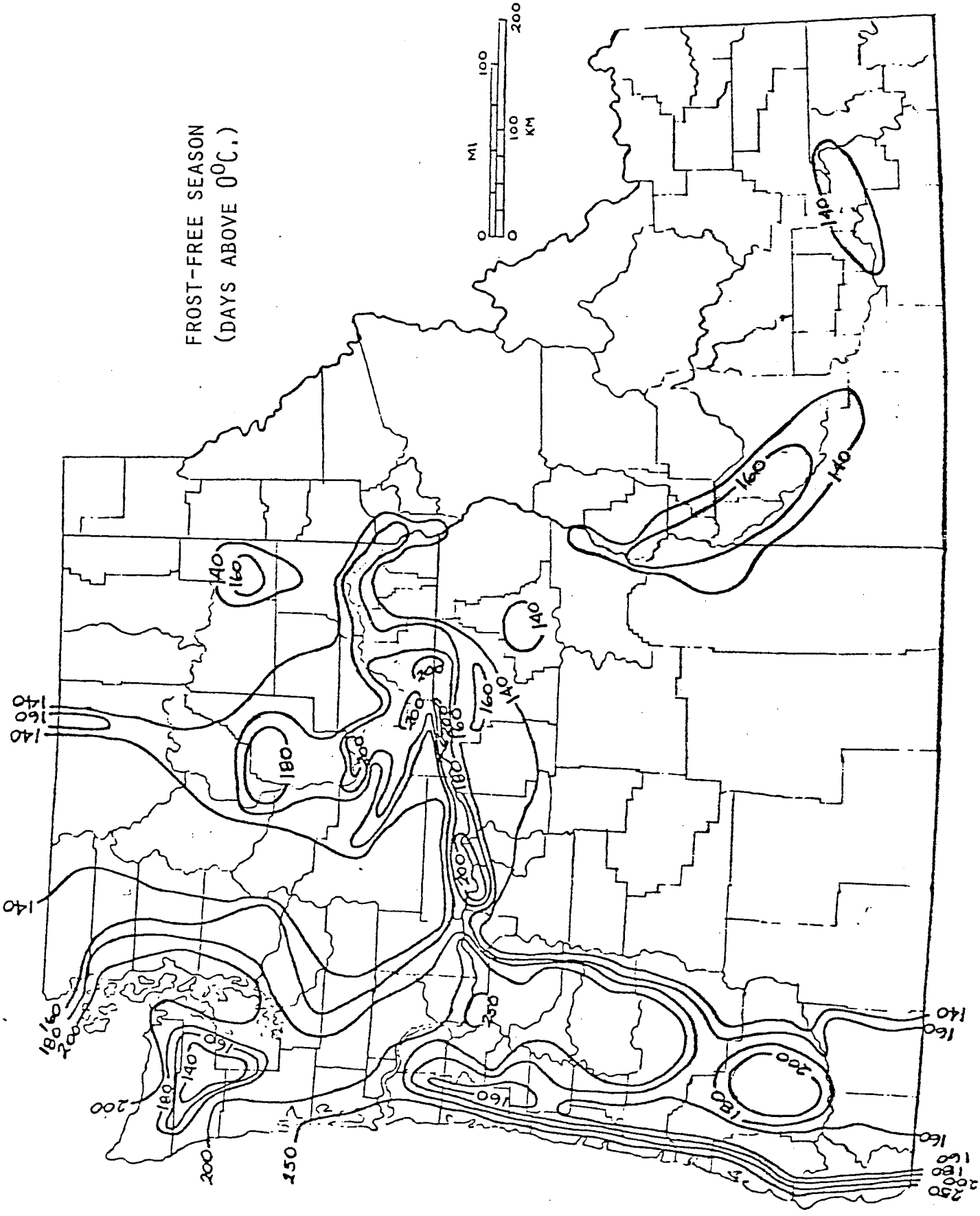

EXPECTED 20-YEAR MINIMUM
TEMPERATURES (°C.)
-18°C = 0°F
-22°C = - 8°F
-26°C = -15°F
-30°C = -22°F
-32°C = -26°F
MI
KM
0
100
200
-32
-30
-26
-22
-18
81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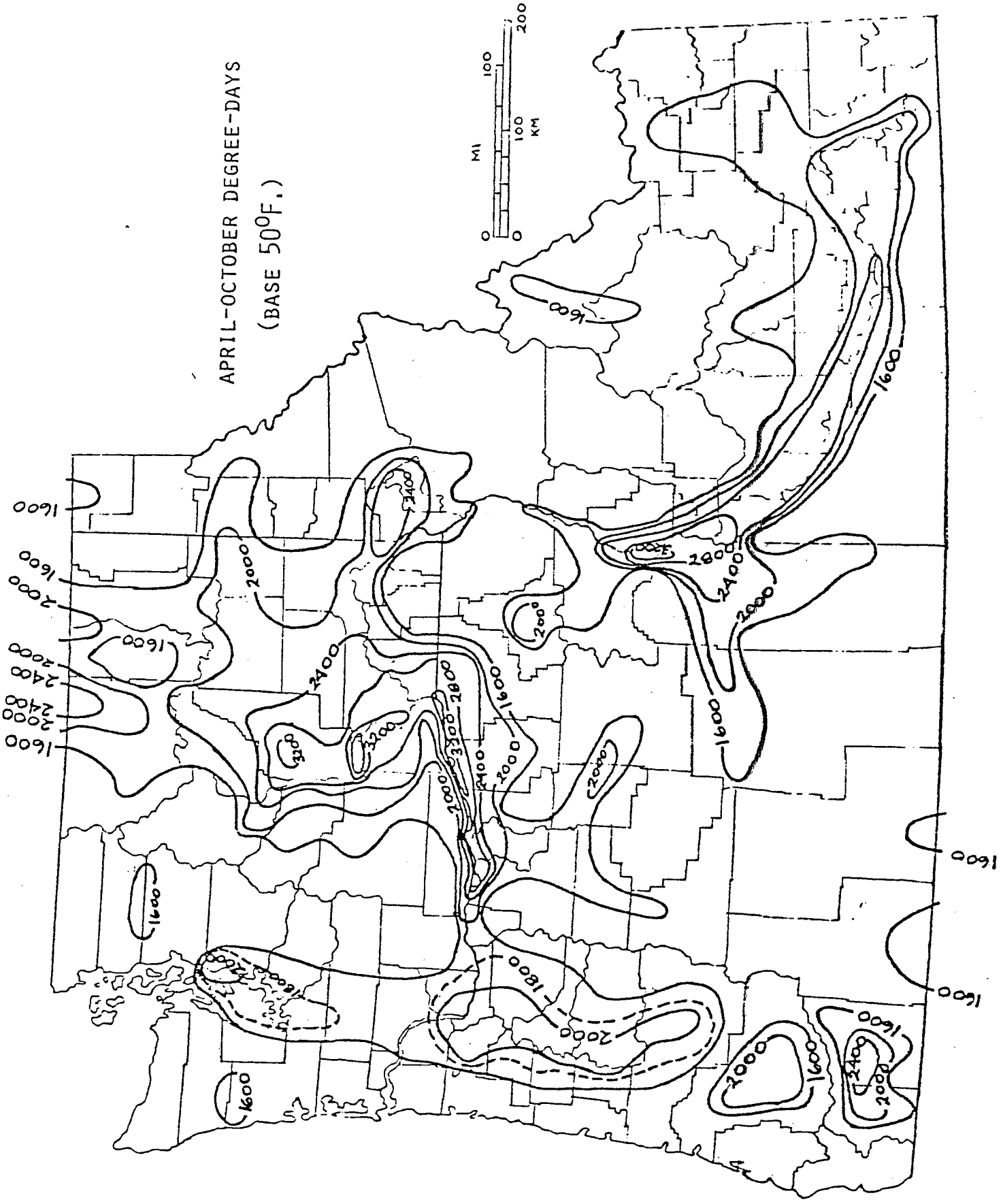
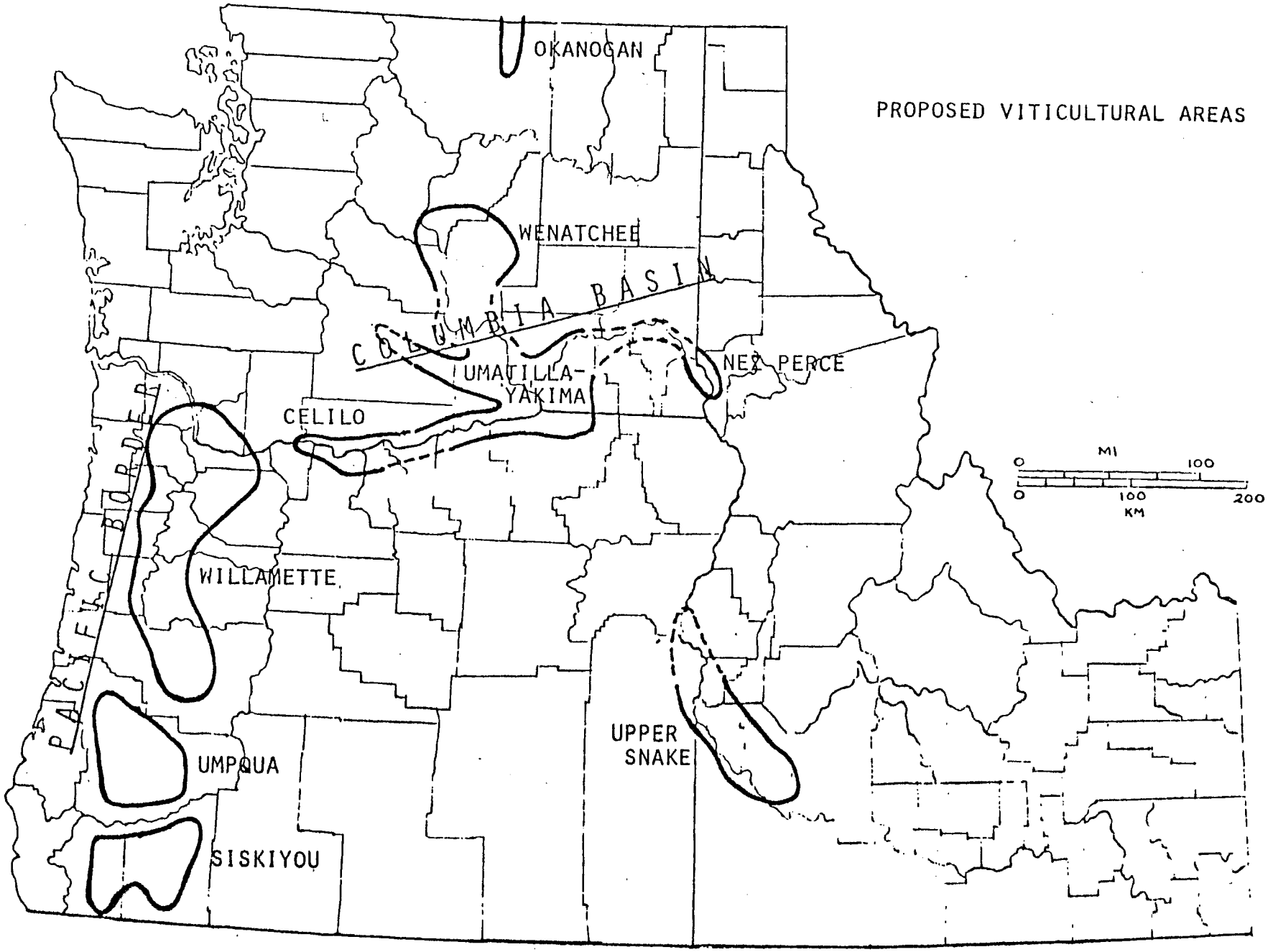
(DAYS ABOVE 0°C.)
MI
KM
0
100
200
100
140
160
180
200
150
250


APRIL-OCTOBER DEGREE-DAYS
(BASE 50°F.)
MI
KM
0
100
200
1600
2000
2400
2800
3200


PROPOSED VITICULTURAL AREAS
OKANOGAN
WENATCHEE
COLUMBIA BASIN
UMATILLA-
YAKIMA
NEZ PERCE
CELILO
PACIFIC BORDER
WILLAMETTE
UMPQUA
SISKIYOU
UPPER
SNAKE
0 MI 100
0 100 200
KM

Region	Area	Station	Elevation	Expected 20-yr. Minimum Temp.	Frost-Free Season (0°C)	Degree-Days Apr-Oct (50°F)
PACIFIC BORDER	WILLAMETTE	Albany, Ore.	65m	-18.3°C	227 days	2193
		Cherry Grove, Ore.	274	-18.3	209	1765
		Cottage Grove, Ore.	198	-20.0	161	1866
		Dallas, Ore.	99	-19.4	165	1852
		Estacada, Ore.	126	-17.8	184	1968
		Eugene, Ore.	137	-18.3	204	1991
		Falls City, Ore.	198	-17.8	186	1768
		Forest Grove, Ore.	53	-18.3	175	2102
		Headworks, Ore.	228	-17.8	216	1808
		Leaburg, Ore.	206	-16.7	217	2181
		Portland CO, Ore.	30	-15.6	279	2380
		Salem, Ore.	55	-17.8	197	2050
		Vancouver, Wash.	30	-19.4	233	2352
	UMPQUA	Drain, Ore.	113	-17.8 [a]	191	2260
		Riddle, Ore.	213	-19.4 [a]	179	2417
		Roseburg, Ore.	146	-15.6	232	2381
	SISKIYOU	Grants Pass, Ore.	282	-16.7 [a]	162	2740
		Jacksonville, Ore.	500	-17.2 [a]		2047
		Medford, Ore.	401	-18.3	178	2705
COLUMBIA BASIN	CELILO	Arlington, Ore.	107	-32.8	187	3192
		Hood River, Ore.	107	-28.9	165	2002
		The Dalles, Ore.	31	-30.0	204	3014
	UMATILLA - YAKIMA	Hermiston, Ore.	190	-35.0 [a]	153	2957
		Milton-Freewater, Ore.	293	-29.4	194	3006
		Umatilla, Ore.	87	-30.6 [a]	188	3265
		Hanford, Wash.	236	-32.8 (53) [b]	175	3186
		Ice Harbor Dam, Wash.	112	-20.6 (8) [b]	194	3170
		Kennewick, Wash.	110	-31.7	187	3118
		Kennewick 10SW, Wash.	457	-27.2 [a]	183	2630
		McNary Dam, Wash.	106	-30.0 (11) [b]	212	3265
		Pasco, Wash.	185		206	3199
		Paterson, Wash.	115		181	3411
		Priest Rapids Dam, Wash.	140	-23.9 (8) [b]	203	3680
		Prosser, Wash.	256	-30.0 [a]	157	2427
		Sunnyside, Wash.	228	-31.1	158	2662
		Wahluke, Wash.	127	-30.6 (39) [b]	195	3920
		Walla Walla, Wash.	289	-27.8	174	3153
		Walla Walla AP, Wash.	357	-27.8	202	2853
		Yakima, Wash.	323	-31.1	177	2293
	WENATCHEE	Ephrata, Wash.	381	-29.4	186	3220
		Wenatchee, Wash.	193	-30.6	188	2718
		Wenatchee AP, Wash.	375		187	2751
	NEZ PERCE	Lewiston, Ida.	230	-23.9	179	2612
UPPER SNAKE		Huntington, Ore.	655	-26.1 [a]	170	3434
		Vale, Ore.	701	-33.3	141	2623
		Boise, Ida.	827	-28.3	174	2558
		Glenns Ferry, Ida.	783	-31.7		2863
		Payette, Ida.	655	-33.3	149	2726
OKANOGAN		Oroville, Wash.	280	-28.3	173	2498

Proposed Parameters for Viticultural Areas in the Pacific Northwest

Viticultural Area		Elevation	Expected 20-year Minimum Temperature	Frost-free Season (Days between 0°C temperatures)	Degree-Days April - October (base 50° F)	Annual Precipitation
PACIFIC BORDER	WILLAMETTE	30-230 m (100-750 ft.)	-16 to -20°C (+3 to -4° F)	160 to 280 days	1800 - 2400	10-60 in.
	UMPQUA	100-300 m (325-1000 ft.)	-16 to -20°C (+3 to -4° F)	180 to 240 days	2000 - 2400	30-50 in.
	SISKIYOU	200-600 m (650-2000 ft.)	-16 to -20°C (+3 to -4° F)	160 to 180 days	2000 - 2900	20-40 in.
COLUMBIA BASIN	CELILO	30-150 m (100-500 ft.)	-29 to -33°C (-20 to -27° F)	160 to 210 days	2000 - 3200	10-30 in.
	UMATILLA -YAKIMA	50-300 m (160-1000 ft.)	-28 to -32°C (-18 to -26° F)	170 to 210 days	2400 - 3900	6-15 in.
	WENATCHEE	180-400 m (600-1300 ft.)	-29 to -32°C (-20 to -26° F)	180 to 200 days	2400 - 3200	8-10 in.
	NEZ PERCE	200-300 m (650-1000 ft)	-26 to -32°C (-15 to -26° F)	160 to 180 days	2400 - 3200	10-15 in.
UPPER SNAKE		600-900 m (2000-3000 ft)	-26 to -33°C (-15 to -27° F)	140 to 180 days	2400 - 3400	8-12 in.
OKANOGAN		250-400 m (800-1300 ft.)	-26 to -32°C (-15 to -26° F)	160 to 180 days	2400 - 2800	10-15 in.

Note: Values used to define area limits are underlined.

82-4

PRELIMINARY EUROPEAN WINE GRAPE ACREAGE IN WASHINGTON, 1981

By

Raymond J. Folwell, Charles W. Nagel,
and Dan J. Kirpes

June 7, 1982

Respectively Professor of Agricultural Economics, Professor of Food Science and Technology, and Research Associate in the Department of Agricultural Economics, Agricultural Research Center, College of Agriculture, Washington State University, Pullman, Washington.

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Introduction

Washington State University has conducted grape acreage surveys in Washington in 1972, 1978, and 1981. These surveys have provided a complete record of the planting of grape varieties by year of planting. The information is assembled via various grape processors and wineries and is confirmed by the individual growers or owners of the vineyards via mail and telephone surveys.

At the end of the 1981 grape growing season, it was determined that there were 6,610.4 acres of European varieties in Washington (Table 1). In addition, there were 15 acres of French hybrids of which 2 acres were nonbearing. These 2 acres were as a result of one acre planted in 1979 and 1981. Overall, the wine grape acreage in Washington is dominated by European varieties. However, in total there are 27,900 acres of grapes in Washington with the Concords accounting for 20,600 acres. Thus, the European varieties account for 26 percent of the total grape acreage in Washington at the end of 1981.

European Varieties

There were over 35 different European varieties commercially planted in Washington (Table 1). However, there were only 11 varieties with more than one hundred acres. It should be noted before discussing each of the major European varieties that of the 6,610 acres of European varieties, only 2,731 are bearing acres. Thus, 58.7 percent of the total European acreage is nonbearing and indicates the significant growth that has occurred in the wine grape acreage in Washington during the last couple of years. This growth is further highlighted in Figure 1 where it demonstrates that prior to 1968 there were only 431 acres in

Figure 1. Vinifera Acreage, 1968-1981.

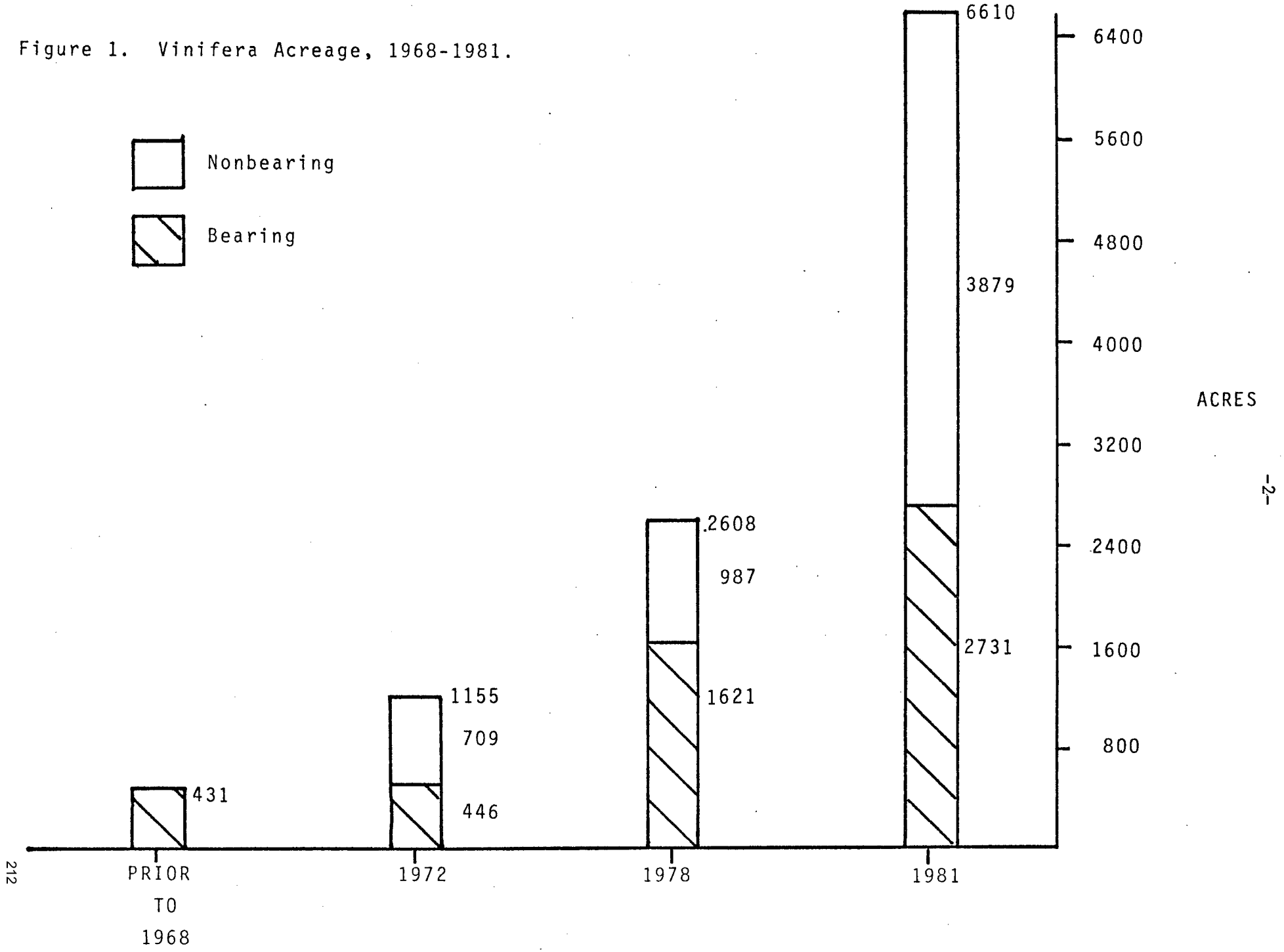


Table 1: Wine Grape Acreage in Washington, 1981 (Acres).

Variety	Year Planted							
	Prior to 1978	1978	1979	1980	1981	Bearing	Non Bearing	Total
European								
Black Mannukka	5.0	0	0	0	0	5.0	0	5.0
Cabernet Sauvignon	293.2	63.7	99.6	120.8	205.3	446.5	336.1	782.6
Carignane	14.0	0	0	0	0	14.0	0	14.0
Chardonnay	142.4	66.3	171.4	226.3	142.9	248.8	500.5	749.3
Chenin Blanc	83.9	53.0	123.8	258.7	237.8	269.3	488.0	757.3
Gamay Beaujolais	17.2	.2	0	0	0	17.4	0	17.4
Grey Riesling	4.1	0	0	0	0	4.1	0	4.1
Gewurztraminer	77.9	72.0	105.7	94.5	99.7	217.4	232.4	449.8
Grenache	38.7	116.4	0	158.2	0	155.1	158.2	313.3
Limberger	3.9	0	1.0	0.5	10.0	4.9	10.6	15.3
Madeline Angevine	1.0	0	1.0	2.0	1.0	4.0	1.0	5.0
Merlot	57.9	12.0	83.7	36.2	161.5	92.0	259.4	351.4
Muller Thurgau	11.0	0	3.0	6.0	4.0	16.0	8.0	24.0
Muscat of Alexandria	25.0	0	11.0	2.0	0	31.0	7.0	38.0
Muscat Canelli	0	0	18.3	109.6	40.8	0	168.7	168.7
Palomino[a/]	18.0	0	0	0	0	18.0	0	18.0
Pinot Noir	91.9	1.0	9.5	5.0	3.0	102.9	7.5	110.4
Royalty	1.4	0	9.6	3.0	0	11.0	3.0	14.0
Salvador	2.0	15.0	0	1.0	0	2.0	16.0	18.0
Sauvignon Blanc	75.9	67.5	172.7	31.0	29.0	165.3	210.9	376.2
Semillon	43.1	80.5	39.8	39.5	163.9	141.0	226.0	367.0
Thompson Seedless	4.0	0	0	0	0	5.0	0	5.0
White Riesling	384.3	166.9	380.4	423.9	631.2	742.0	1,243.8	1,985.8
Other	13.6	0	1.0	6.0	1.0	19.6	2.0	21.6
Total European	1,409.4	714.5	1,213.5	1,524.2	1,731.1	2,731.3	3,879.1	6,610.4
All French Hybrids	13.0	0	1.0	0	1.0	13.0	2.0	15.0

[a/] Same as Golden Chasselas

the State of Washington. This total acreage increased to 1,155 in 1972, then to 2,608 in 1978, and finally to the 6,610 acres in 1981. In 1972, 1978, and 1981 the bearing acreage represents 38.6, 62.2, and 41.3 percent of the total acreage, respectively. The nonbearing acreage was correspondingly 61.4, 37.8, and 58.7 percent of the total acreage. The recent increase to almost 60 percent nonbearing acreage is reflective of the growth that has occurred in the European wine grape industry.

White Riesling

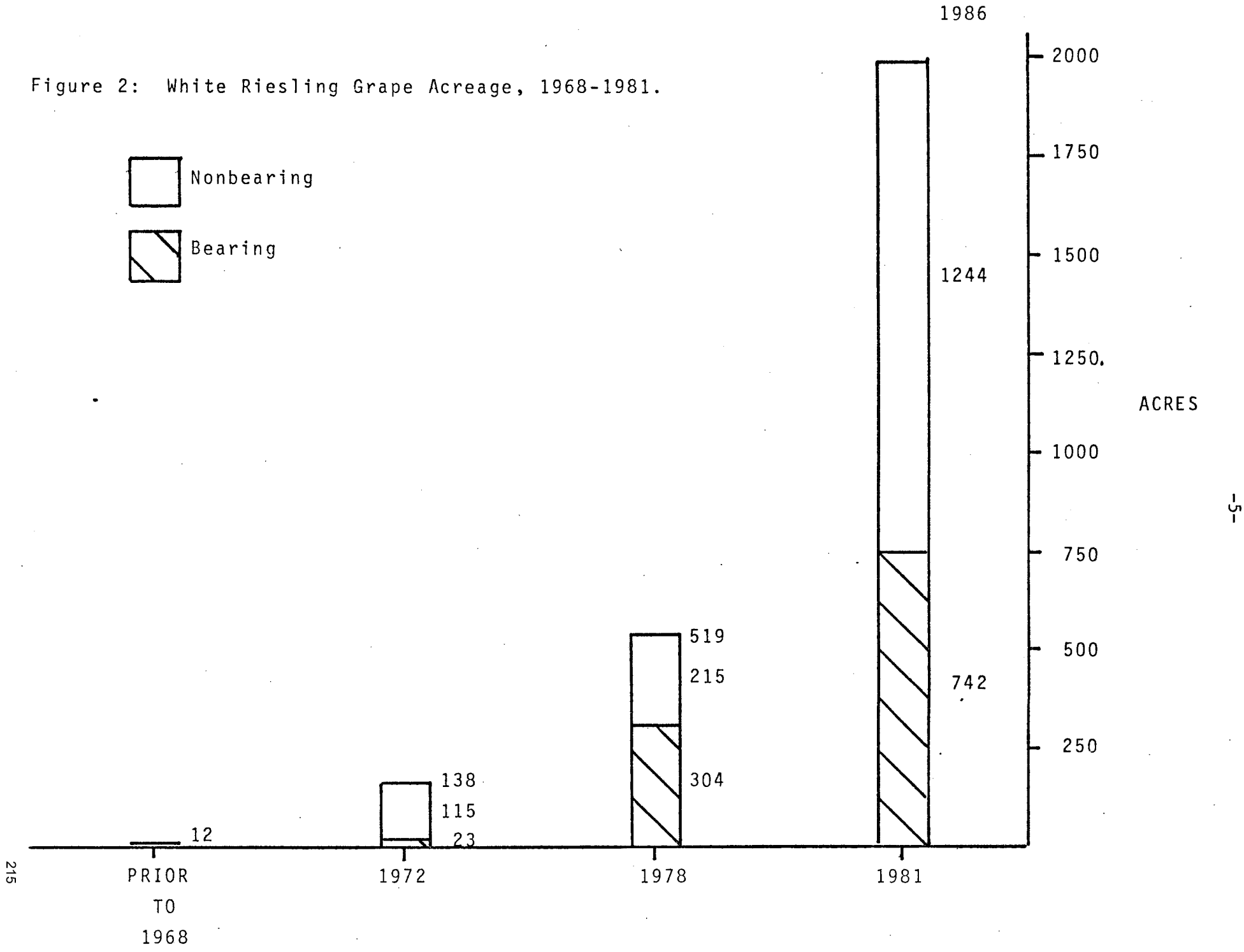
The White Riesling variety dominates the European acreage in Washington (Figure 2). In 1981 there were 1,986 acres of which 1,244 were nonbearing. Over 60 percent of the White Riesling acreage at the end of 1981 was nonbearing in contrast to 1978 when only 41.4 percent of the 519 acres were nonbearing. However, in 1972 when there was significant relative growth in the industry, 83.5 percent of the 138 acres was nonbearing. Overall, the acreage of White Riesling in 1981 represented almost a fourfold increase over the acreage that existed in 1978.

There has been approximately 400 acres or more of White Riesling planted in each of the three previous years (Table 1). Overall, the average size planting of White Riesling in Washington is 23 acres and there are 86 growers or firms which currently have this variety.

Cabernet Sauvignon

The second most important European variety in Washington, in terms of total acreage, is Cabernet Sauvignon (Figure 3). In 1981 there were 783 acres of which 42.9 percent were nonbearing. This relatively smaller amount of nonbearing acreage in Cabernet Sauvignon is reflective of the

Figure 2: White Riesling Grape Acreage, 1968-1981.



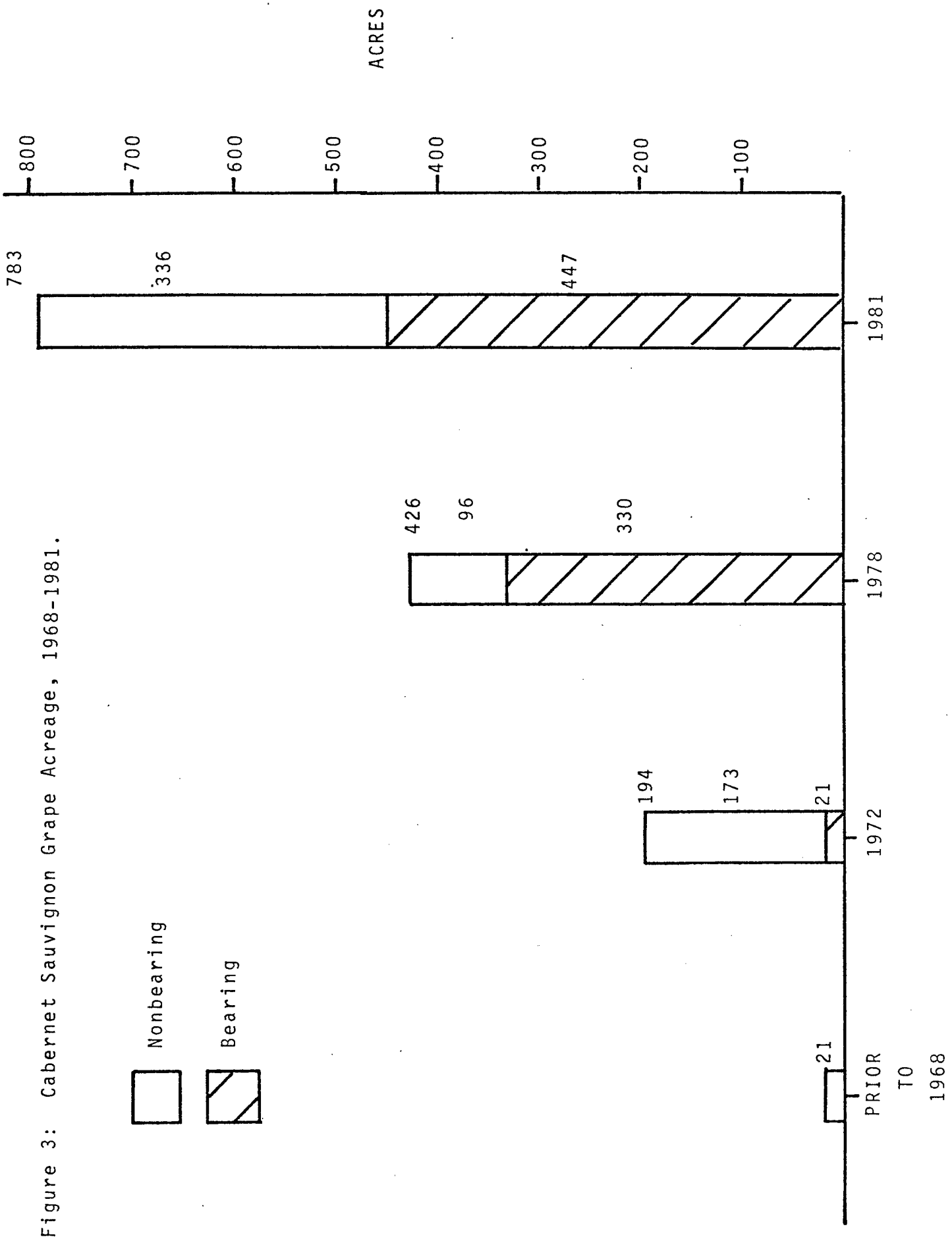


Figure 3: Cabernet Sauvignon Grape Acreage, 1968-1981.

smaller growth rate in this variety as compared to White Riesling as discussed above.

The Cabernet Sauvignon variety is currently being grown by 48 different vineyard operations. The average size planting is 16.3 acres.

Chenin Blanc

The total grape acreage of Chenin Blanc in 1981 in Washington was 757 acres (Figure 4). In fact, 63.7 percent of the acreage is nonbearing which is reflective of the growth rate discussed above in relation to White Riesling. The amount of nonbearing acreage in Chenin Blanc has been high in 1972, 1978, and 1981. While this grape variety has shown significant relative growth, its growth in an absolute sense has been less than that of the White Riesling. Between 1978 and 1981 the acreage of the Chenin Blanc variety increased over fourfold in Washington. However, even this large relative increase resulted in the Chenin Blanc acreage being only 38.1 percent of that for White Riesling.

In 1981 there were only 29 growers with the Chenin Blanc variety. The average planting was 26.1 acres. This is in contrast to the fact that prior to 1978 the average planting was only 7 acres per grower with only 12 growers accounting for the 84 acres of Chenin Blanc planted prior to 1978.

Chardonnay

The total acreage of Chardonnay in 1981 was 749 acres which is not significantly different from that reported for Chenin Blanc or Cabernet Sauvignon (Figure 5). However, in contrast to Chenin Blanc, there are

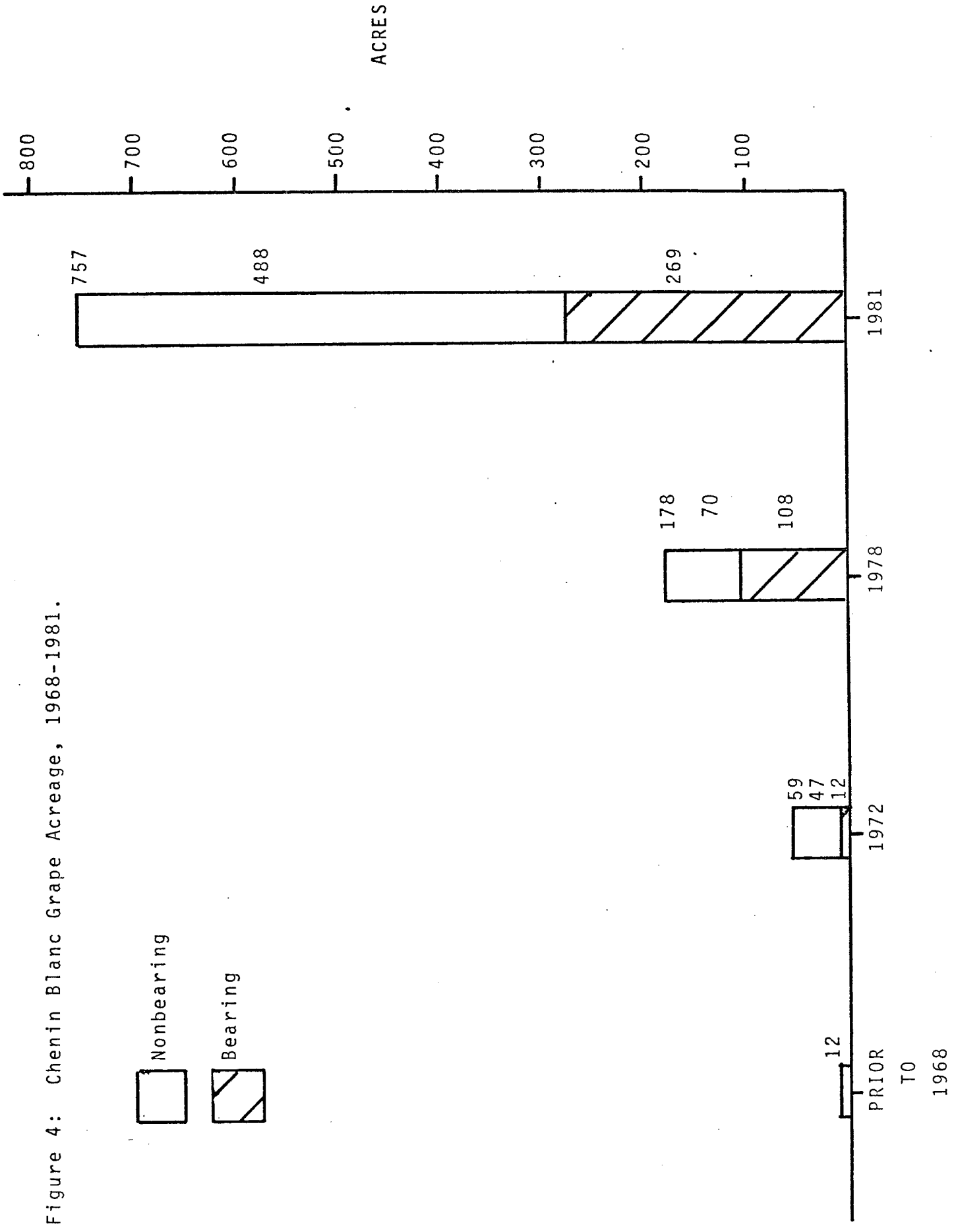


Figure 4: Chenin Blanc Grape Acreage, 1968-1981.

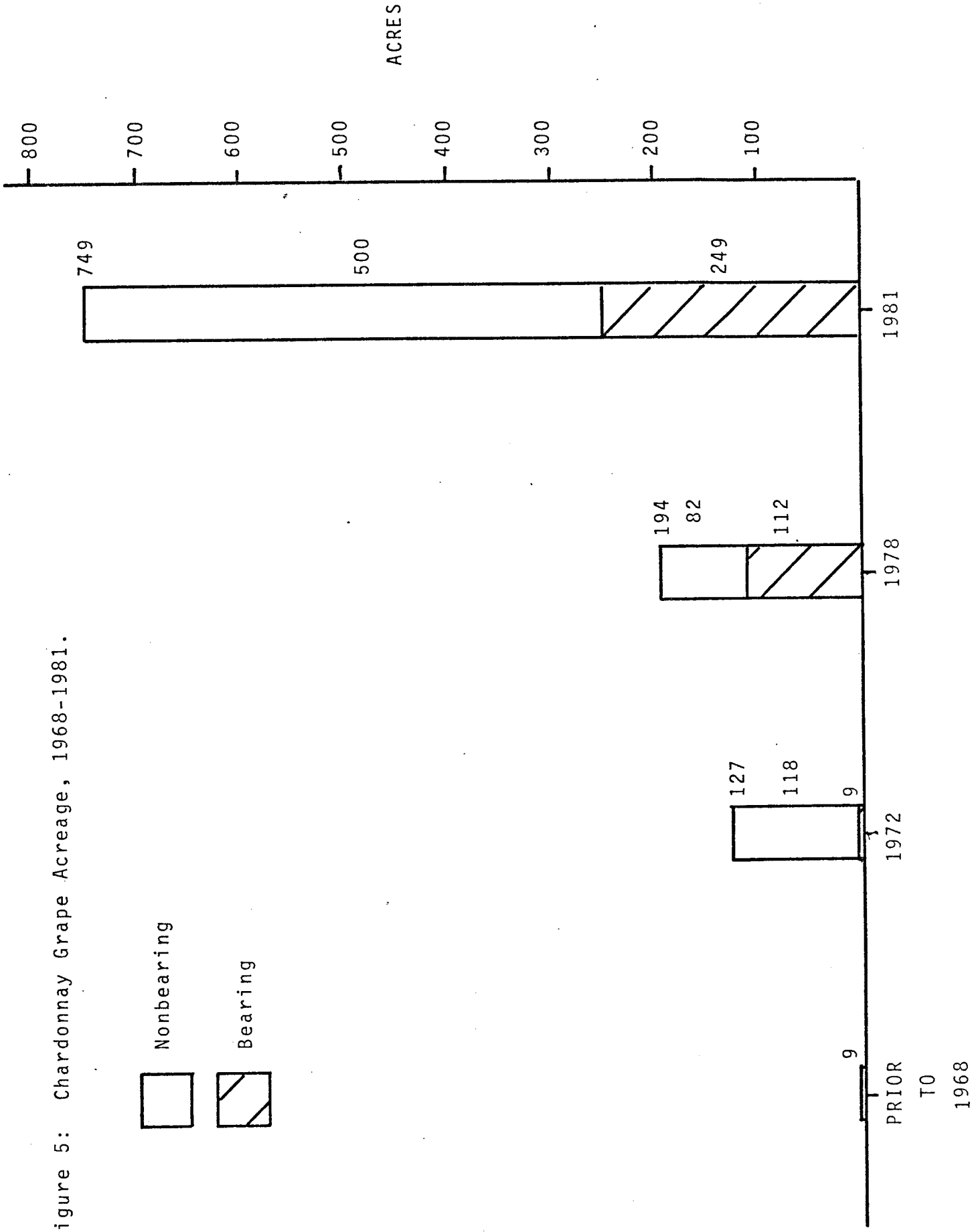


Figure 5: Chardonnay Grape Acreage, 1968-1981.

48 different vineyards growing Chardonnay, with an average size planting of 15.6 acres. The size of plantings of the Chardonnay grape are much smaller than those for the Cabernet Sauvignon or the Chenin Blanc. This fact is also true when looking at older plantings prior to 1978. In that time period there were 20 growers with average plantings of 6.8 acres accounting for a total acreage of 142 prior to 1978.

The relative growth in the Chardonnay grape is shown in Figure 5. The increase in total acreage between 1978 and 1981 was almost fourfold. As a result of this growth in this short time period, 67 percent of the total Chardonnay acreage is nonbearing in 1981.

Gewurztraminer

The total acreage of Gewurztraminer in Washington in 1981 was 450 (Figure 6). This represents only a 2.5 fold increase over 1978. As a result, only slightly over half of the total Gewurztraminer acreage is nonbearing in 1981. This is in contrast to the varieties discussed earlier where up to two-thirds of the total acreage was nonbearing.

The Gewurztraminer has many of the same characteristics as the Chardonnay in terms of number and size of plantings. In 1981 there were 48 different vineyards reporting Gewurztraminer with an average planting of 9.4 acres. This number of growers with their small plantings has held throughout the history of the current Washington wine industry. Prior to 1978, there were 21 growers with average plantings of only 3.7 acres each.

Sauvignon Blanc

Sauvignon Blanc is a major white European variety for which there are more than 100 acres in Washington in 1981 (Figure 7). In 1981 there

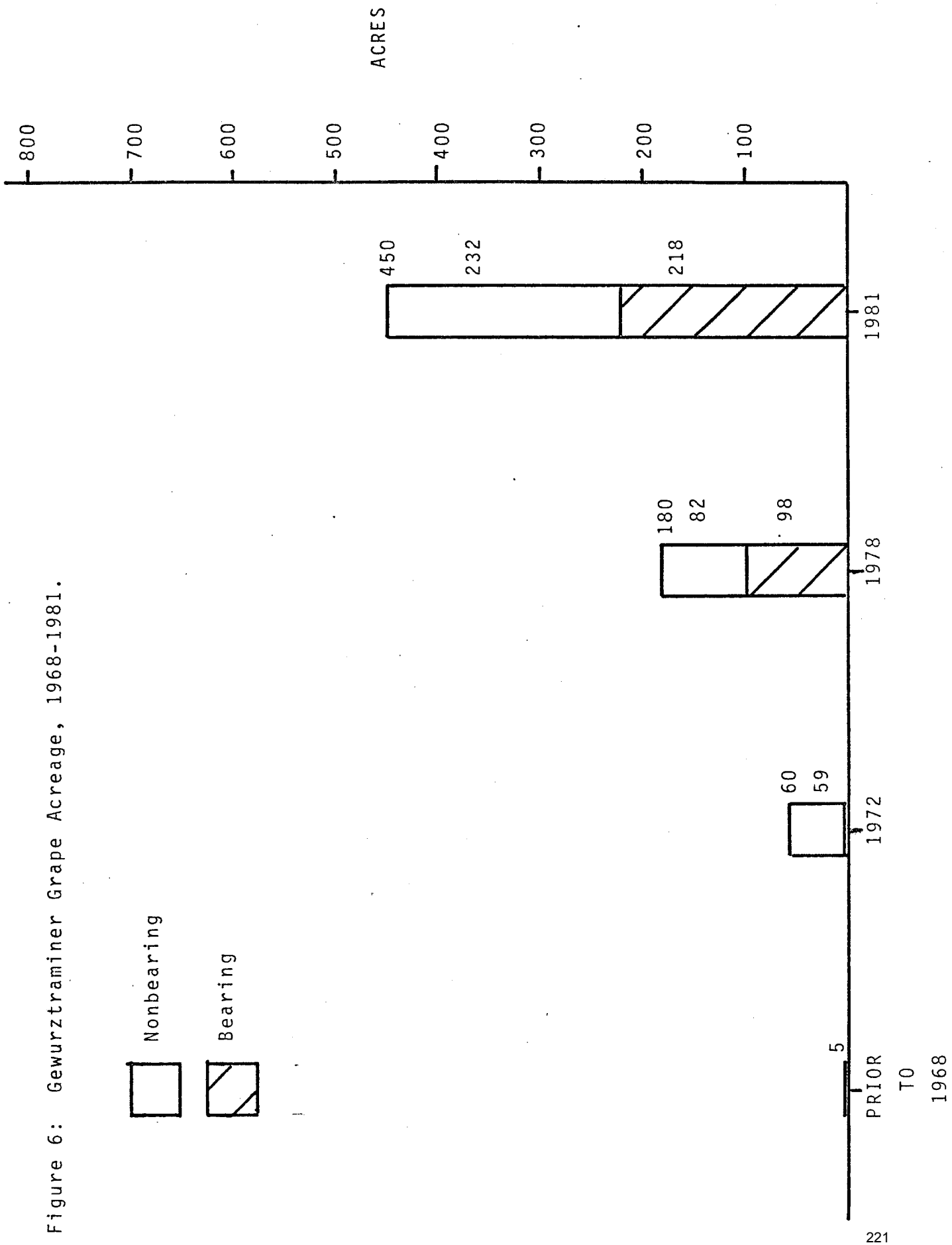


Figure 6: Gewurztraminer Grape Acreage, 1968-1981.

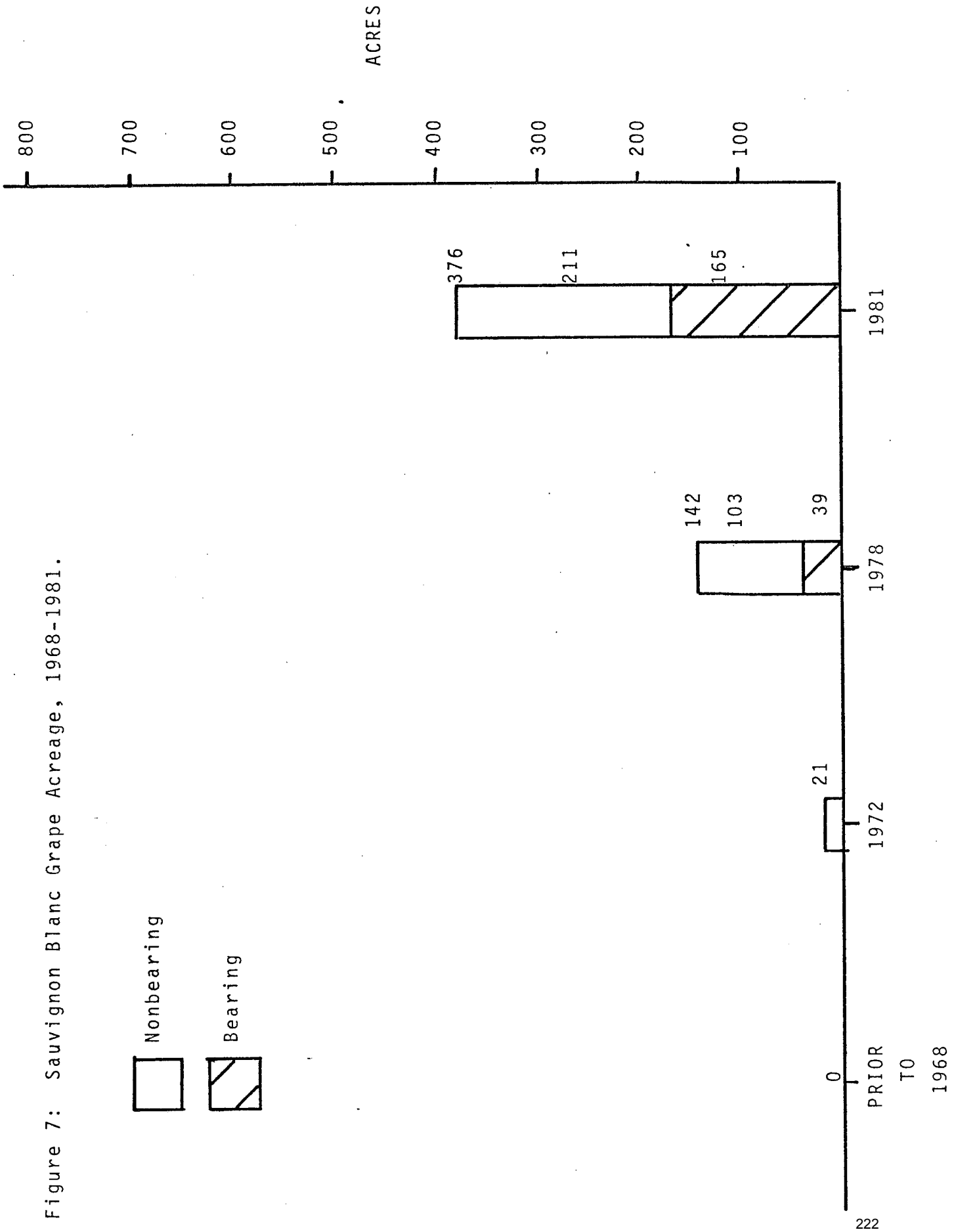


Figure 7: Sauvignon Blanc Grape Acreage, 1968-1981.

were 376.2 acres of which 210.9 acres or 56.1 percent were nonbearing. The proportion of nonbearing acreage in this variety is down slightly from that in 1978 when the nonbearing acreage accounted for 72.5 percent. The Sauvignon Blanc variety is grown only in 13 different vineyards in the state with the average planting being 15.9 acres. The growth in this variety has been significant with a net increase of 300 acres between 1978 and 1981, or a fivefold increase. This is reflected also in the number of growers where prior to 1978 there were eight with average plantings of 9.5 acres.

Semillon

In 1981 there was a total of 366.9 acres of Semillon in Washington (Figure 8). Only 17 growers accounted for this acreage with average plantings of 21.6 acres. The small number of growers of this grape variety also was true during the 1970's. As an example, prior to 1978 only 7 growers in the state accounted for 43 acres with an average planting of 6.2 acres.

The growth in the Semillon grape has not been as great as the varieties discussed above. The increase between 1978 and 1981 was only slightly over twofold. However, despite this relatively small growth rate the current acreage of Semillon is currently 61.6 percent nonbearing. In fact, between 1972 and 1978 the growth rate was 218.5 percent, while between 1978 and 1981 the growth rate was only 132.2 percent.

Merlot

The total acreage of Merlot in Washington in 1981 was 351 acres (Figure 9). Of the 351 acres, 259 were nonbearing or 73.8 percent. From 1978 to 1981 there was a 2.5 fold increase in acreage. However,

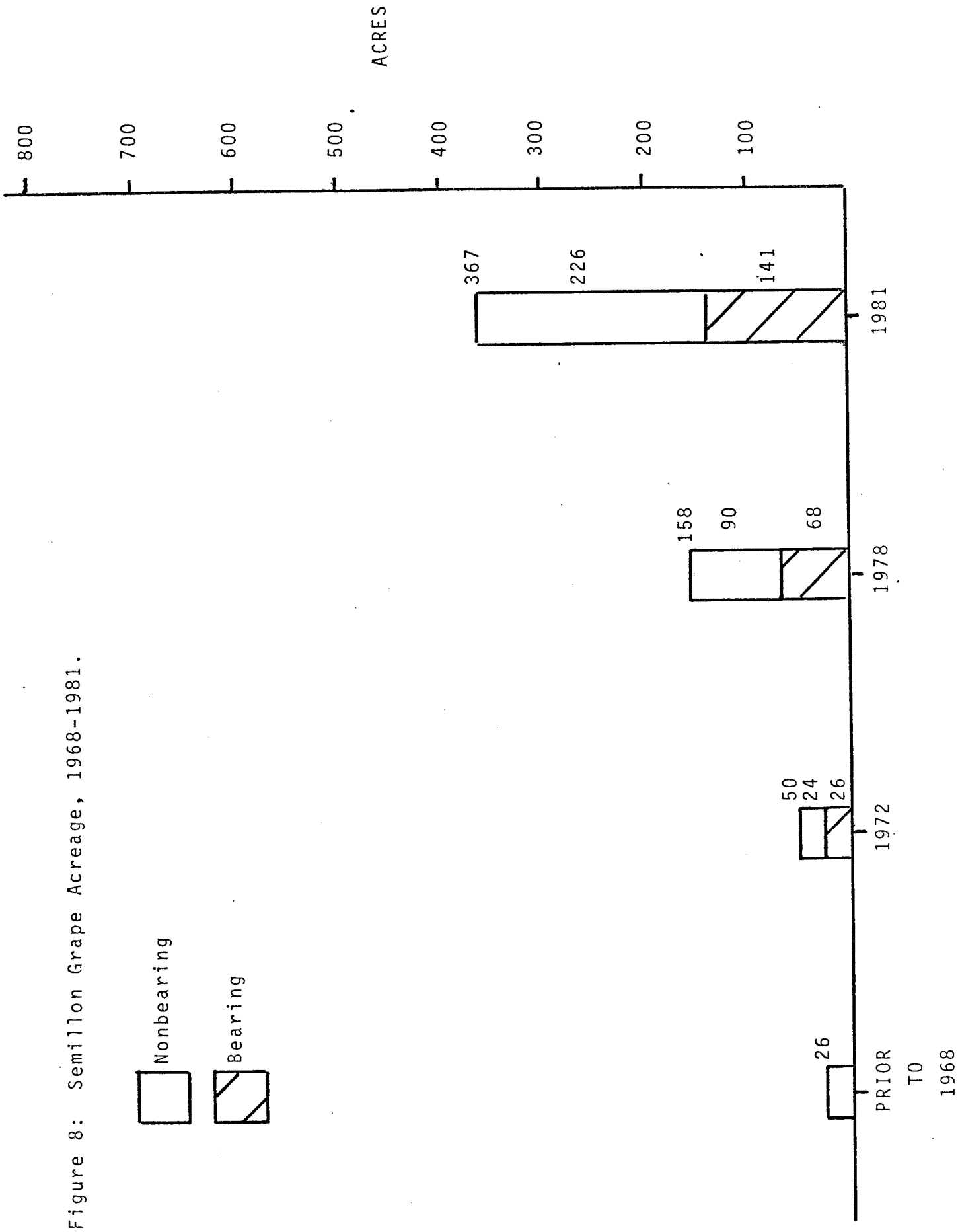


Figure 8: Semillon Grape Acreage, 1968-1981.

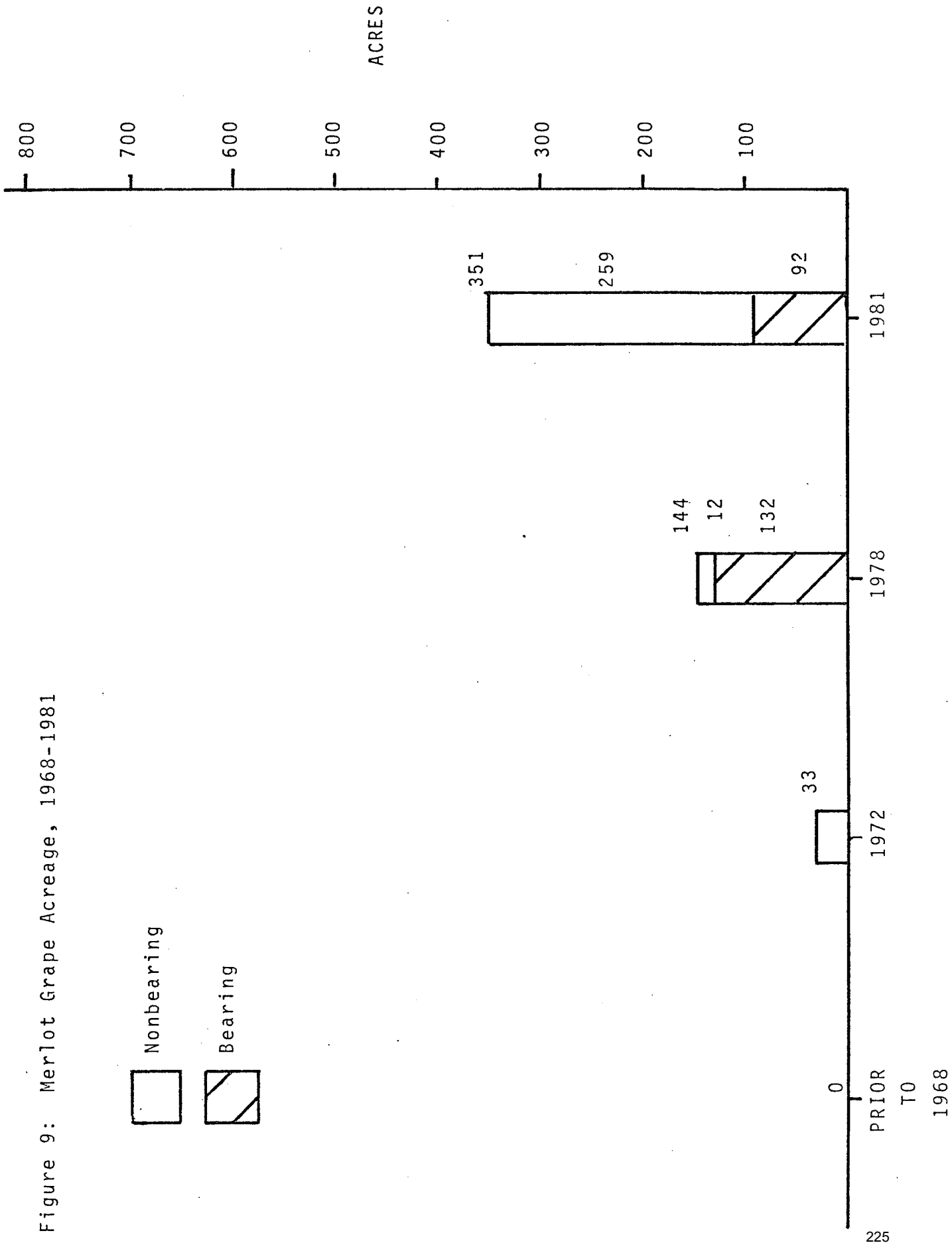


Figure 9: Merlot Grape Acreage, 1968-1981

from 1972 to 1981 there was over a tenfold increase in this variety. This growth is in contrast to the much smaller growth rate with Cabernet Sauvignon, where the growth rate was less than twofold.

The Merlot acreage is contained in 29 different vineyards. The average planting per vineyard is 12.1 acres. The number of growers have not increased as much as the acreage. The number of Merlot growers prior to 1978 numbered 11 in Washington with an average planting of 5.3 acres. Thus, the tenfold increase in acreage from the 1970's to the 1980's has occurred primarily from expansion from within existing vineyards or operations and not from new growers.

Grenache

The total acreage of Grenache in Washington was 313.3 acres in 1981 (Figure 10). Of this total 158.2 acres or one-half was nonbearing. The proportion of nonbearing acreage has decreased from 60.7 percent which existed in 1978. As a result of the Grenache being controlled in the hands of very few operations, statistics on the average size planting and number of growers will not be presented.

Muscat Canelli

The Muscat Canelli grape accounts for 168.7 acres in Washington in 1981 (Figure 11). It is worth noting, as indicated in Table 1, that these plantings have all occurred since 1978 and thus, for purposes of this report, the entire acreage is deemed as nonbearing at this time. The total number reporting was 9 in 1981 with an average planting of 18.8 acres. The range in size of plantings of this grape, which are new to the Washington wine industry, are from approximately 6 acres to over 80 acres.

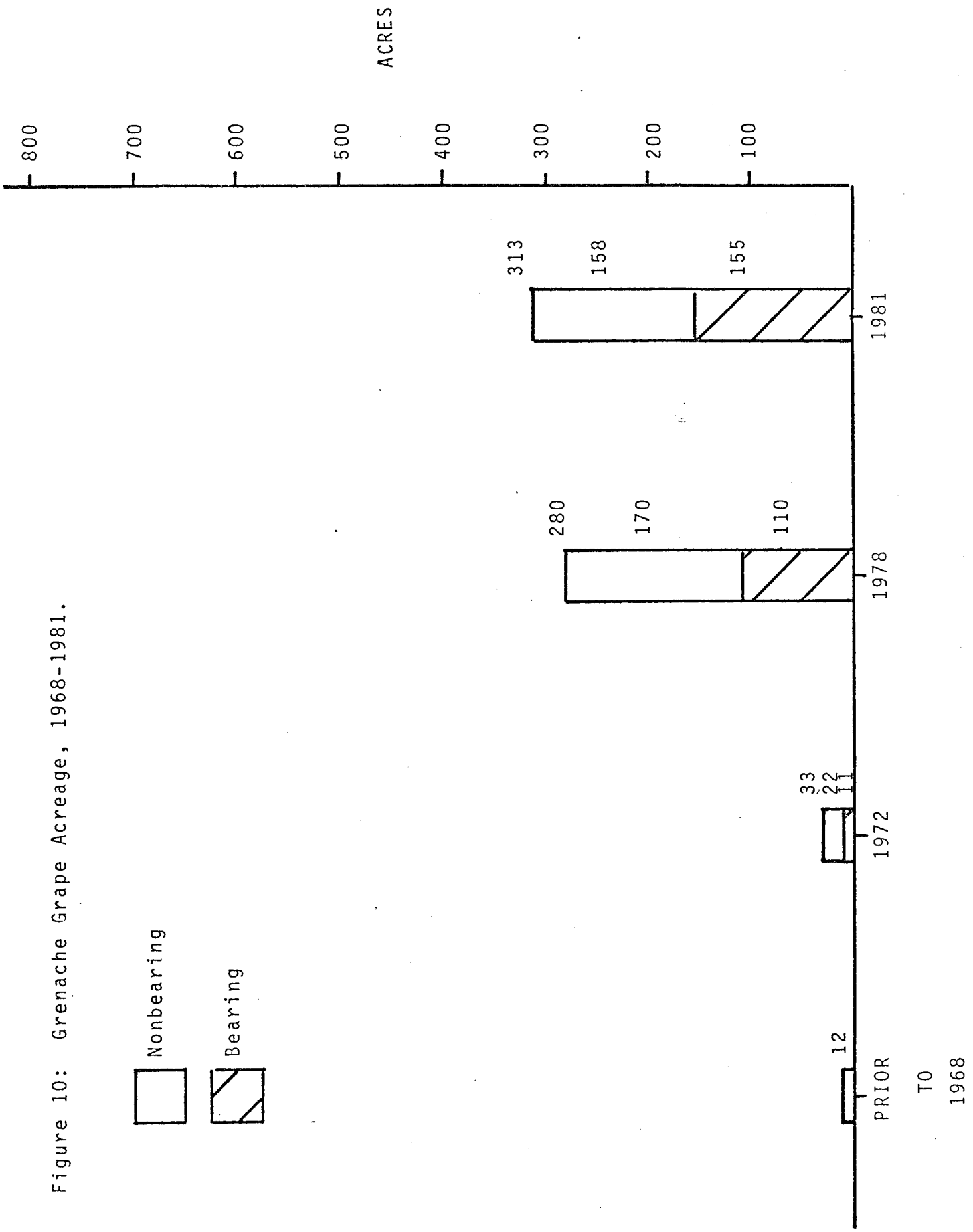
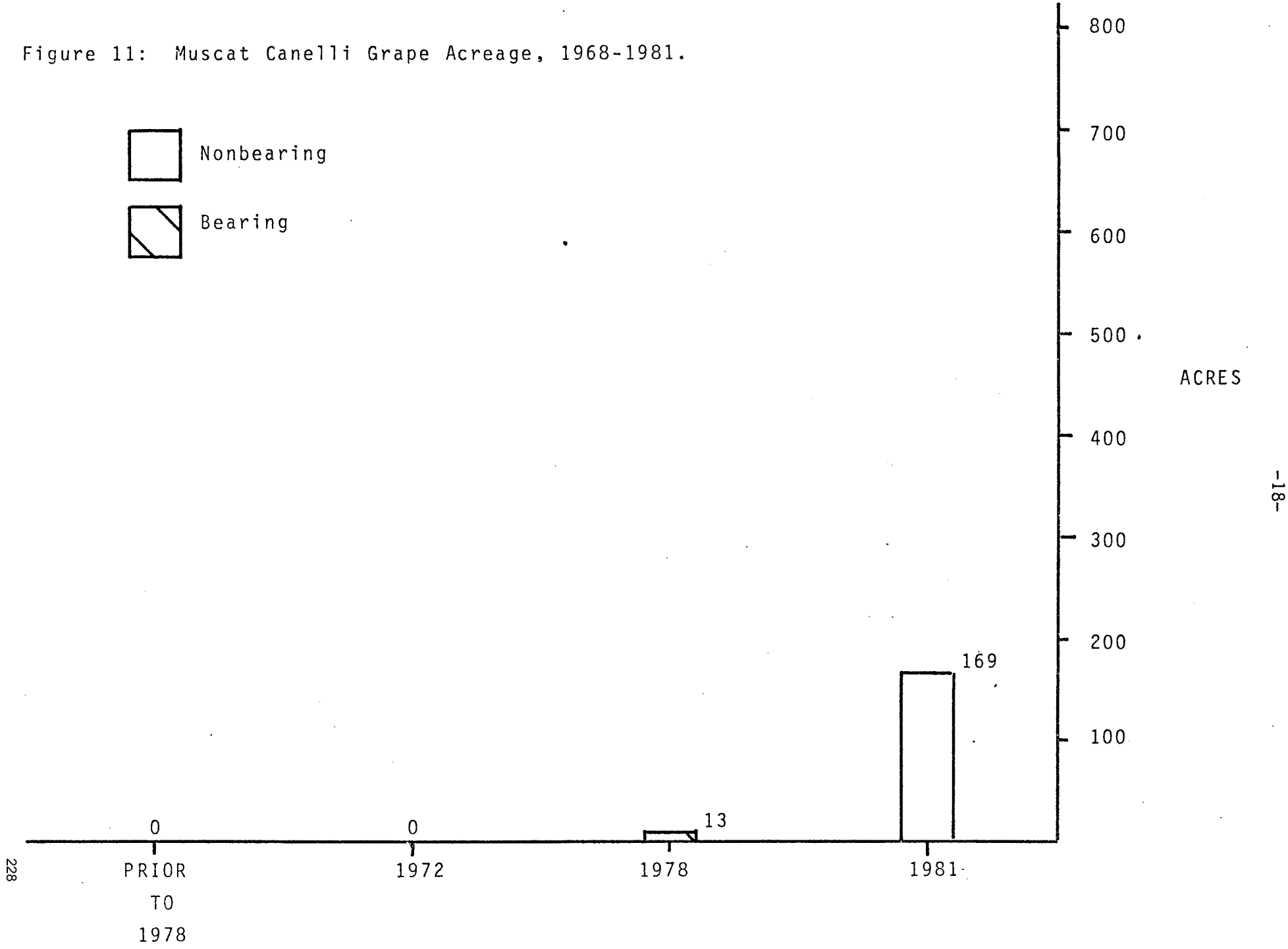


Figure 10: Grenache Grape Acreage, 1968-1981.

Figure 11: Muscat Canelli Grape Acreage, 1968-1981.



Pinot noir

In 1981 there were 110.4 acres of Pinot noir in the ground (Figure 12). The vast majority of the Pinot noir was bearing. The nonbearing acreage accounted for 6.8 percent of the total acreage. The Pinot noir has shown a very low increase in total acreage. Between 1978 and 1981 the increase was only 9.4 acres or 9.3 percent.

Currently in Washington there are 19 different vineyards reporting with an average planting of 5.8 acres. Prior to 1978 there were 15 growers with average plantings of 6.1 acres each. Thus, while the number of growers or vineyards reporting Pinot noir has increased by four the average size of plantings of this variety have not changed significantly.

Other

As indicated in the introduction to this paper, there are over 35 European varieties planted in Washington. The 11 varieties discussed above account for a total of 6,416.8 acres or 97 percent of the European acreage. The other varieties for which there are more than four acres planted in the state are listed individually within Table 1. These plantings range from a low of 4 acres for Thompson Seedless to 38 for Muscat of Alexandria. Thus, the other 12 varieties for which there are greater than four but less than 100 acres listed in Table 1 account for only 194 acres or an average of 16.2 acres per variety. This accounts for only 3 percent of the total European grape acreage in Washington.

There is another set of varieties not separately listed in Table 1 which account for only 21.6 acres in the state. The vast majority of these grapes were planted on an experimental or trial basis prior to 1978. Currently of the 21.6 acres of these miscellaneous varieties only 2 acres are nonbearing.

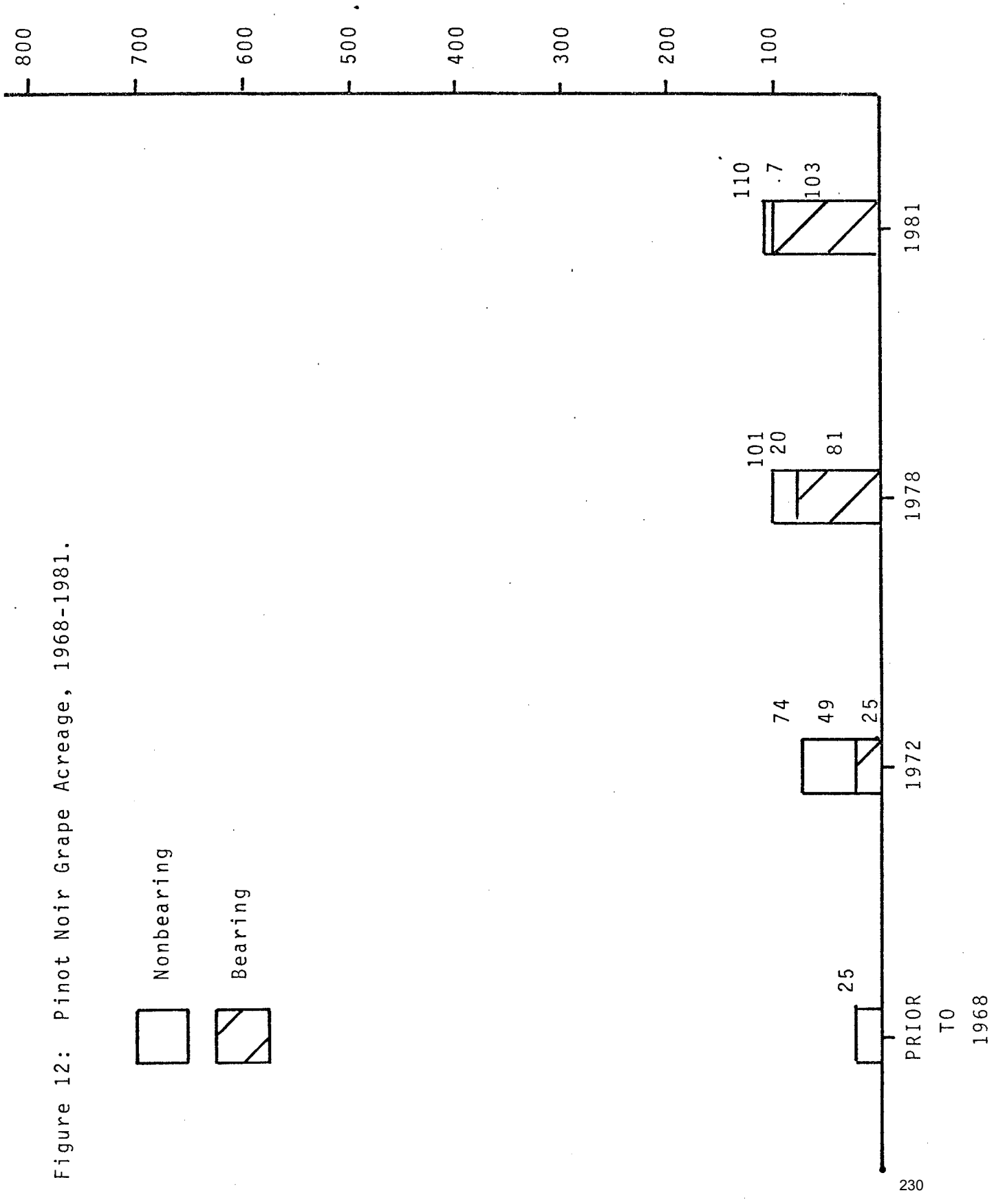


Figure 12: Pinot Noir Grape Acreage, 1968-1981.

Chateau Ste Michelle

Post Office Box 580
Grandview, Washington 98930
509/882-3928

March 21, 1983

Mr. Charles Bacon
Research and Regulations Branch
Bureau of Alcohol, Tobacco and Firearms
Washington D.C. 20226

Dear Mr. Bacon:

I apologize for the delay in returning the maps. They are enclosed with the revised Columbia Valley Appellation borders marked in light yellow. The narrative description plus revisions on Dr. Clore's original proposal will follow soon (hopefully!). The appellation is now restricted to six 1:250,000 maps: Yakima, Walla Walla, Pendleton,Ritzville, Wenatchee and The Dalles. The Columbia Valley appellation includes the proposed Yakima Valley appellation in its entirity and therefore utilizes its borders, differing only in two places to the northwest of Richland. The Hanford Reservation is excluded from the proposal, as is the Walla Walla Valley appellation. The proposal is entirely in the State of Washington.

Sincerely,

Wade H. Wolfe

Wade H. Wolfe
General Vineyard Manager

WALTER CLORE, Consultant
1317 PATERSON ROAD, PROSSER, WASHINGTON 99350

September 23, 1982

Mr. Charles Bacon
Bureau of Alcohol, Tobacco and Firearms
Washington D.C. 10116

Dear Mr. Bacon:

Following your request by phone on September 20, 1982 I made an estimate of the "Columbia Valley" viticulture area of Washington State by counting townships. I estimated 19,260 square miles of a State land area of 66,977 square miles. I have asked Dr. Wade Wolfe, viticulturist, to have a more accurate measure made by planimeter.

The preliminary grape acreage as of 1981, as determined by Washington State University, was 27,900 acres. Of this amount 6,610 acres were vinifera varieties with Concords accounting for 20,600 acres. The remainder is mainly American hybrids. My estimate of the vinifera acreage at the end of the 1982 plantings is 8,000 acres.

As I stated over the phone, if further information is desired during October and November, please contact Dr. Wade Wolfe, Viticulturist, Ste. Michelle Vintners, Inc. P.O. Box 580, Grandview, Washington 98930. Phone - (509) 882-3928.

Sincerely,

Walter J. Clore

Walter J. Clore,
Viticulture Consultant

509 - 786 - 3899

R. P D.V.

WALTER CLORE, Consultant
1317 PATERSON ROAD, PROSSER, WASHINGTON 99350

July 22, 1982

Mr. Stephen E. Higgens, Director
Bureau of Alcohol, Tobacco and Firearms
Washington D.C. 10116

Dear Mr. Higgins:

Enclosed is a submitted proposal, maps, accompanying data and references concerning the application for an American Viticulture Area under the provisions of the Treasury decision ATF - 60 and 27 CFR part 9. The proposed viticultural area which involves similar soils and climatic conditions in the State of Washington is to be known as the "COLUMBIA VALLEY".

As the proposed "Columbia Valley" appellation involves a rather large area, wide interest of vineyard and winery personnel in Washington will be involved. A convenient central location for a hearing would be the Red Lion Motel in Pasco, Washington. This motel is adjacent to the main highway US 395 and is less than a mile from the Pasco Airport served by Republic, Western and Horizon Airlines.

When arrangements need to be made for scheduling a hearing, please contact me and/or Mr. Wallace Opdycke, President, Chateau Ste. Michelle, One Stimson Lane, P.O. Box 1976, Woodinville, 98702, Mr. Bill Preston, President, Preston Wine Cellars, Star Route 1, Box 1234, Pasco, 99301, Mr. Mike Wallace, President, Hinzerling Vineyards, 1520 Sheridan Avenue, Prosser, 99350, Mr. Jerry Warren, President, Enological Society of the Pacific Northwest, c/o Department of Rehabilitation Medicine, RJ - 30, University of Washington, Seattle, 98195, Mr. Keith Ellis, Director, Department of Agriculture, State of Washington, Olympia, 98504.

Sincerely,

Walter J. Clore

Walter J. Clore, PhD
Viticulture Consultant

RECEIVED
1982 JUL 30 PM 3:22
DIRECTOR, BUREAU OF
ALCOHOL, TOBACCO & FIREARMS

Out of USA for 6 weeks
beginning first of October

Person to
Contact
509-882-

Dr. Wade Wolfe -
Grandview, Washington 98930
- Chateau Ste. Michelle -

AMERICAN APPELLATION VITICULTURE AREA FOR EASTERN AND SOUTH CENTRAL WASHINGTON

TO BE KNOWN AS —

"COLUMBIA VALLEY"

The appellation conditions of the "Columbia Valley" viticulture area are defined as follows:

150 frost free (32°F) or more growing days;

2,000 or more heat units (daily degrees above a mean of 50°F for April-October) (see Climatic Data and references 7,13,14,20,27,31,41,45);

Elevation not to exceed 2,000 feet;

Area rainfall not to exceed an annual average of 15 inches. (see Exhibit 1 - Map of Annual Precipitation & Climatic Data);

Two or more feet of such soil types as silt loam, fine sandy loam, sandy loam and loamy sands (ref. 25,35,36,37,38,43).

The viticulture area in Washington covers parts or all of the following counties: Klickitat, Yakima, Kittitas, Chelan, Okanogan, Douglas, Ferry, Stevens, Spokane, Lincoln, Grant, Adams, Whitman, Asotin, Garfield, Columbia, Walla Walla, Franklin and Benton. A narrative description of the viticulture boundaries and marked Geological Survey map (scale 1:500,000) is enclosed (Exhibit 2).

This area is distinguished by its broadly undulating or rolling surface, cut by rivers and broken by long sloping basaltic uplifts extending generally in an east-west direction, and a natural lack of native forests (ref. 5,15,18,23,24,25).

The Cascade Range borders the west side of the "Columbia Valley" keeping this area open and barren by intercepting most of the Pacific air moisture (ref. 5,25). On the north, this area is enclosed by the Okanogan Highlands, on the east, by the Greater Spokane Area, and the eastern portion of the high rolling Palouse Prairie. The south side is bordered by the Blue Mountains, Oregon and the Colubmia River. The area surrounding the "Columbia Valley" viticulture area is forested, except for the immediate southside. For these bordering areas, elevations generally exceed 2,000 feet, rainfall exceeds 15 inches annually, the growing season is less than 150 frost free days and heat units fall below 2,000 degrees (see precipitation map and climatic data).

Within the "Columbia Valley" viticulture area there is a range of elevations from 400 feet to over 3600 feet, rainfall varies from an average of 6.3 to slightly over 26 inches, growing degree days range from less than 1400 to over 3300 and the frost free days can be 140 or less. However, within this viticulture area along the Columbia, Snake and Yakima River Valleys extensive lands with comparable climatic conditions can be found which meet the defined requirements of this viticulture area (ref. 5,17,26,32,34, 39,43,45,46). This is the basis for defining such a large area which extends two degree Latitude (46° to 48°) and nearly over 4° Longitudes (117° to 121°) and proposing to name it "Columbia Valley." (See U.S. Geological Survey Map 1:500,000)

Historical evidence and geographical features: The Lewis and Clark Pacific Expedition in 1804-06 first mapped a broad area involving Washington, Idaho and Oregon as "Columbia Valley" (see Exhibit 3 - Map of Lewis & Clark Track). The term "Columbia Valley" has been used in other publications, such as, Geology of the Grand Coulee (ref. 24), and Grand Coulee and Neighboring Geological Wonders (ref. 15).

"Columbia" is now being used as a brand name by Columbia Wine Cellars, Redmond, Washington. Other have used this name in the past.

The grape is not indigenous to this area, but vines of both vinifera and labrusca type grapes can be found growing throughout the proposed viticulture area (ref. 1,8,6,30,40). The oldest planted vinifera vines still in existence were planted by German emigrants in the Tampico vicinity, west of Union Gap, in 1871. Others were planted in the Kennewick area in 1895 (ref. 9). Unattended vines can still be found near Chelan and Manson, Keller Ferry, the mouth of the Spokane River, Maryhill and the Maryhill museum, Plymouth and the Lewiston-Clarkston area.

Plantings of premium vinifera wine grapes began in the early sixties. Currently there are over 8,000 acres of vinifera grapes grown in Washington including the following major varieties: Merlot, Cabernet Sauvignon, Chardonnay, Chenin Blanc, Sauvignon Blanc, Gewurztraminer, Grenache, White Riesling, Muscat, Semillon and Pinot Noir. All of these acres are included within the boundaries of the Columbia Valley.

Wines were made in Washington prior to Prohibition, but commerical winemaking did not start until the repeal of Prohibition (ref. 1,2,8,12,16,22,29,34,47,48,49). At one time there were as many as 42 bonded wineries in operation making grape, fruit and berry wines (ref. 1,12,34). At present there are 28 bonded wineries (Wash. State Liquor Board) devoted mainly to making premium vinifera grape wines (ref. 3,10,11,22,39,44,47,49).

The early explorers and pioneers have referred to this treeless, undulating semi-arid area as Columbia Valley, Columbia Plain, Great Columbia Plain, Columbia Plateau, Columbia Basin and Inland Empire. This area is described by Freeman & Martin (ref. 15), "as a rather flat, somewhat tilted, deformed triangle measuring 250 air miles along each side, with its apex at the mouth of the Okanogan River in north central Washington, its southern corners in the Deschutes County of eastern Oregon and the Camas Prairie of northern Idaho."

Map 1 in Meinigs book (ref. 25) outlines rather well the "Great Columbia Plain and Some Physical Subregions" as does "Pictorial Landform Map of the State of Washington and Adjacent Parts of Oregon, Idaho and British Columbia" and satellite pictures of this area in color (see Exhibit 4). Notably the periphery of the proposed "Columbia Valley" viticulture appellation closely approximates the circumscribed area marked by 15" or less rainfall (see "Mean Annual Precipitation" map).

EXHIBIT 1

WASHINGTON CLIMATIC DATA

FOR THE "COLUMBIA VALLEY" APPELLATION

Station	Elevation (ft.)	Latitude	Frost Free Season Days	Annual Precipitation (inches)	Apr-Oct Degree Days	Lowest Occurring Min. Temp. F°
Klickitat, County						
Dallesport	222	45° 37'		13.70	2,817	-25
John Day Dam	186	45° 43'		10.59	3,216	- 2
Goldendale	1,800	45° 49'	128	17.41	1820	-29
Yakima, Co.						
Naches	1,874	46° 39'		8.38	2,391	-15
Yakima	1,064	46° 34'	184	7.86	2,274	-25
Moxee	1,000	46° 35'		7.36	1,992	-23
Wapato	850	46° 26'		7.11	3,124	-27
White Swan	970	46° 23'	137	8.22	2,390	-37
Fort Simcoe	1,300	46° 20'		12.41	2,791	-20
Toppenish	765	46° 22'		5.88	2,267	-32
Sunnyside	747	46° 19'	160	6.90	2,666	-30
Kittitas, Co.						
Ellensburg	1,729	47° 02'	148	8.75	2,127	-31
Cle Elum	1,930	47° 11'	132	22.10	1,678	-33
Grant Co.						
Priest Rapids Dam	460	46° 39'		6.80	3,796	-11
Wahluke	416	46° 39'		6.36	3,920	-23
Smyrna	560	46° 50'		8.39	2,391	-28
Moses Lake	1,208	47° 07'	143	8.10	2,338	-33
Quincy	1,274	47° 13'	160	8.19	2,397	-29
Trinidad	555	47° 13'	189	8.24	3,432	-17
Ephrata	1,259	47° 18'	186	8.42	3,204	-33
Wilson Creek	1,276	47° 25'	130	9.17	2,268	-30
Hartline	1,910	47° 41'	156	10.91	2,360	-19
Grand Coulee Dam	1,700	47° 57'	194	10.66	2,512	
Ruff	1,342	47° 10'	127	9.62	2,391	-31
Chelan Co.						
Wenatchee	1,229	47° 25'	177	9.99	2,818	-21
Dryden	920	47° 32'		16.78		
Leavenworth	1,128	47° 34'	136	23.91	2,145	-26
Plain	1,940	47° 47'	87	25.65	1,381	-31
Chelan	1,120	47° 50'	201	11.23	2,667	-15
Manson						
Okanogan, Co.						
Methow	1,165	48° 08'		12.44	2,360	-37
Brewster	878	48° 06'	175	10.48	2,758	-23
Pateros	825	48° 03'		13.13	3,062	-16
Okanogan	900	48° 22'	168	11.65	2,972	-23
Omak 2NW	850	48° 25'	141	12.44	2,238	-23
Oroville 3NW	1,060	48° 56'	163	11.43	2,543	-19
Nespelem	1,890	48° 08'	128	13.57	2,024	-33
Ferry, Co.						
Inchelium	1,685	48° 19'		17.59	1,839	-26
Laurier	1,644	49° 00'	123	19.26	2,055	-32

Station	Elevation (ft.)	Latitude	Frost Free Season Days	Annual Precipitation (inches)	Apr-Oct Degree Days	Lowest Occurring Min. Temp. F°
Stevens County						
Boulder Road	1,450	48° 50'				
Kettle Falls	1,265	48° 34'		16.12	2,054	-32
Colville	1,635	48° 33'	124	17.67	1,901	-29
Cedonia	2,000	48° 08'		19.43	1,260	-24
Lincoln Co.						
Odessa	1,540	47° 20'	129	10.81		
Sprague	1,925	47° 18'	129	14.70		
Adams, Co.						
Hatton	1,428	46° 46'	135	9.94	2,510	-30
Lind Exp. Station	1,625	47° 00'	143	10.11	2,525	-26
Othello	1,110	46° 50'	151	8.16	2,666	-26
Ritzville	1,825	47° 07'	137	11.67	2,440	
Whitman, Co.						
Colfax 1NW	1,955	46° 53'	121	20.97	2,005	-26
Ewan	1,720	47° 07'		16.32		
La Crosse ESE	1,546	46° 48'	115	14.05	2,365	-30
Asotin, Co.						
Alpowa Ranch	730	46° 25'		10.82	3,156	-17
Clarkston Hts.	1,185	46° 23'	157	13.15	2,605	-18
Garfield, Co.						
Pomeroy	1,810	46° 28'	141	16.58	2,287	-22
Wawawai 2NW	695	46° 39'		18.74	3,310	-10
Columbia, Co.						
Dayton	1,620	46° 19'	163	19.53	2,425	-22
Dayton 5NW	1,710	46° 22'		17.32		
Huntsville	1,400	46° 18'		17.57		
Walla Walla, Co.						
Attalia	360	46° 06'		6.87		
Mill Creek	2,000	46° 01'		39.56		
Mill Creek Dam	1,275	46° 04'		17.61		
Pleasant View	1,650	46° 31'		12.39		
Touchet	443	46° 02'		9.83		-23
Walla Walla FAA	1,185	46° 06'		18.43	2,881	-25
Walla Walla 3W	800	46° 03'	171	15.33	3,031	-25
Walla Walla WBO	949	46° 02'		15.50	3,217	-16
Frankline Co.						
Kahlotus	1,340	46° 36'		10.37		
Mesa	875	46° 36'		7.72		
Pasco	360	46° 13'		7.40		
Connell 4NNW	1,125	46° 14'				
Connell 12SE	1,078	46° 30'		9.44		
Eltopia 7WNW	895	46° 29'		8.47		
Benton Co.						
Hanford	385	46° 35'		6.39	3,308	-23
Kennewick	392	46° 13'	184	7.49	3,181	-23
Kennewick 10SW	1,500	46° 08'		9.93	2,636	-17
McNary Dam	348	45° 57'		7.64	3,247	-22
Mottinger	307	45° 56'		8.34	3,461	-14
Prosser	675	46° 12'		8.53	2,848	-22
Prosser 4NE	840	46° 15'	155	7.77	2,548	-20
Richland 25NNW	733	46° 34'		6.73	3,230	-27

EXHIBIT 2

"COLUMBIA VALLEY"

Narrative of American Viticulture Area Appellation Boundary in Washington State.

The starting point of the "COLUMBIA VALLEY" appellation is the confluence of the Klickitat and Columbia Rivers at Lyle, Washington (WA). Follow the Klickitat River up to Wahkiacus; then up the Little Klickitat River to Goldendale; north on U.S. 97 to Toppenish Ridge (TR); west on TR to Toppenish Creek; northwest to Agency Creek; north on Township Line (TL) to Tieton River (TR); TR to Naches River; east on TL to Yakima River (YR); north on YR to N. Branch Canal (NBC) diversion; east on NBC to Hwy 90; east on Hwy 90 to Columbia River (CR); north on CR, west of West Bar to Rock Island Dam, then west to Beehive Mtn; northwest along Chelan National Forest (CNF) to Peshastin; then east along CNF, then north along CNF above Ardenvoir, then southeast (SE) to CR; north along CNF to Wenatchee National Forest border; east to Okanogan National Forest (ONF) and north along east side of ONF to Methow; from Methow east to Monse, then east to 2,000' elev; follow 2,000' elev. south to Bridgeport Point (BP); from BP follow 2,000' elev. along north side of Columbia River (CR) to north side of Goose Lake and south on 2,000' elev. along CR to Colville Indian Agency, then south to Belvedere; east from Belvedere on TSL to Hwy 25; south from TSL & Hwy 25, then south one TS; east five TS, then south to Nine Mile Falls; south on Spokane River to Hwy 2; west on Hwy 2 to Davenport; south on Hwy 28 to Harrington; southeast on Hwy 23 to Sprague, Lamont, Ewan, Saint John and Steptoe; south from Steptoe on Hwy 195 to Colfax, Pullman and Idaho border and Clarkston; south along Snake River to Asotin; west from Asotin along Asotin Creek to Charley Creek and Umatilla National Forest; north to Peola; from Peola follow Hwy 128 northeast to Pomeroy; from Pomeroy west on Hwy 12 to Zumwalt; from Zumwalt follow Hwy 126 to Turner and Dayton; follow Hwy 12 from Dayton to Waitsburg and Dixie; south from Dixie follow 2,000' elev. line to Washington-Oregon border (WOB); west on WOB to CR, then down the CR marking the border of Washington and Oregon to the mouth of the Klickitat River.

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EXHIBIT 2

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# # # # # # #

Chateau Ste Michelle

Grandview Winery
Post Office Box 580
Grandview, Washington 98930
509/882-3928

February 18, 1983

Mr. Charles Bacon
Research and Regulations Branch
Bureau of Alcohol, Tobacco and Firearms
Washington D.C., 20226

Dear Mr. Bacon:

I am in receipt of the maps. I will meet with Dr. Clore early next week to finalize the new Columbia Valley Appellation boundaries and return the maps with a narrative description.

Sincerely,

Wade H. Wolfe

Chateau Ste. Michelle

Post Office Box 580
Grandview, Washington 98930
509.882-3928

March 28, 1983

Mr. Charles Bacon
Research and Regulations Branch
Bureau of Alcohol, Tobacco and Firearms
Washington D.C. 20226

Dear Mr. Bacon:

Enclosed are the written revisions to Dr. Clore's original Columbia Valley appellation proposal sent to BATF last July. It is noted that the revisions apply to the first four pages of his proposal, including the narrative description of the appellation area, and the U.S.G.S. maps, which you have already received. The remaining documents he sent are still pertinent to the revised proposal. Dr. Clore and I have worked together on the revision and all changes meet with his approval.

Sincerely,

Wade H. Wolfe
General Vineyard Manager.

AMERICAN VITICULTURAL AREA FOR SOUTH CENTRAL WASHINGTON

TO BE KNOWN AS —

"COLUMBIA VALLEY"

The appellation conditions of the "Columbia Valley" viticultural area are defined as follows:

150 frost free (32°F) or more growing days;

2,000 or more heat units (daily degrees above a mean of 50°F for April-October). See Climatic Data and reference 7,13,14, 20,27,31,41,45;

Elevation not to exceed 2,000 feet;

Area rainfall not to exceed an annual average of 15 inches. (See Exhibit 1-Map of Annual Precipitation & Climatic Data):

Two or more feet of such soil types as silt loam, fine sandy loam, sandy loam and loamy sands (ref. 25,35,36,37,38,43).

The viticultural area in Washington covers parts of the following counties: Klickitat, Yakima, Kittitas, Grant, Adams, Walla Walla, Franklin and Benton. A narrative description of the viticultural boundaries and marked Geological Survey Maps (scale 1:250,000) are enclosed (Exhibit 2).

The viticultural appellation lies within the Columbia Basin, an area distinguished by its broadly undulating or rolling surface, cut by rivers and broken by long sloping basaltic uplifts extending generally in an east-west direction, and by a natural lack of native forests (ref. 5,15,18,23,24,25). This basin is bordered to the west by the Cascade Range, which keeps it open and barren by intercepting most of the Pacific air moisture (ref. 5,25). On the north it is enclosed by the Okanogan Highlands, on the east by the Greater Spokane area and the high rolling Palouse Prairie, and on the south by the Blue Mountains and the Columbia River. The area surrounding the Basin is generally forested, with elevations exceeding 2000' and annual precipitation 15 inches, and with less than 150 frost free days and 2000 heat units (see precipitation

map and climatic data).

Within the Basin, the "Columbia Valley" viticultural appellation is restricted to land in Washington State adjacent to the Columbia and Yakima Rivers and their tributaries (see maps). In addition to meeting the climatic and soil criteria outlined above, it contains land of proven or highly estimated viticultural value based on existing vineyards. Other land of potential has been excluded due to remoteness, lack of irrigation water, or uncertainty of favorable climatic conditions. The appellation includes five major east-west basaltic uplifts that provide favorable southern slopes for grape cultivation: Horse Heaven Hills, Rattlesnake Hills, Saddle Mountains (Wahluke Slope), Frenchman Hills (Royal Slope), and Beezley Hills (Quincy Slope). There are several smaller uplifts on which grapes are also grown. A sixth major area of vineyard development is the land with a predominately southwestern exposure to the north and east of the Tri-Cities (Richland, Kennewick and Pasco). Excluded from the appellation is the Atomic Energy Commission's Hanford Reservation to the northwest of the Tri-Cities. Some ridge crests are in the appellation that exceed the elevation limitations (ie Rattlesnake Hills), but they were included to simplify the geographical boundaries.

Historical evidence and geographical features: The Lewis and Clark Pacific Expedition in 1804-06 first mapped a broad area involving Washington, Idaho and Oregon as "Columbia Valley" (see Exhibit 3-Map of Lewis and Clark Track). The term "Columbia Valley" has been used in other publications, such as, Geology of the Grand Coulee (ref. 24), and Grand Coulee and Neighboring Geological Wonders (ref. 15).

"Columbia" is now being used as a brand name by Columbia Wine Cellars, Redmond Washington. Others have used this name in the past.

The grape is not indigenous to this area, but vines of both vinifera and labrusca type grapes can be found growing throughout the proposed viticulture area (ref. 1,8,6,30,40). The oldest planted vinifera vines still in existance were planted by German emigrants in the Tampico vicinity, west of Union Gap, in 1987. Others were planted in the Kennewick area in 1895 (ref. 9). Unattended vines can still be found near Chelan and Manson, Keller Ferry, the mouth of the Spokane River, Maryhill and the Maryhill Museum, Plymouth and the Lewiston-Clarkston area.

Plantings of premium vinifera wine grapes began in the early sixties. Currently there are 8,000 acres of vinifera grapes grown in Washington including the following major varieties: Merlot, Cabernet Sauvignon, Chardonnay, Chenin blanc, Sauvignon blanc, Gewurztraminer, Grenache, White Riesling, Muscat blanc, Semillon and Pinot noir. The great majority of these acres are included within the boundaries of the Columbia Valley.

Wines were made in Washington prior to Prohibition, but commercial winemaking did not start until the repeal of Prohibition (ref. 1,2,8,12,16,22,29,34,47,48,49). At one time there were as many as 42 bonded wineries in operation making grape, fruit and berry wines (ref. 1,12,34). At present there are 31 bonded wineries (Washington State Liquor Board) devoted mainly to making premium vinifera grape wines (ref. 3,10,11,22,39,44,47,49).

The early explorers and pioneers have referred to this treeless, undulating semi-arid area as Columbia Valley, Columbia Plain, Columbia Plateau, Columbia Basin and Inland Empire. This area is

described by Freeman & Martin (ref. 15), "as a rather flat, somewhat tilted, deformed triangle measuring 250 air miles along each side, with its apex at the mouth of the Okanogan River in north-central Washington, its southern corners in the Deschutes County of eastern Oregon and the Camas Prairie of northern Idaho".

Map 1 in Meinigs book (ref. 25) outlines rather well the "Great Columbia Plain and Some Physical Subregions" as does "Pictorial Landform Map of the State of Washington and Adjacent Parts of Oregon, Idaho and British Columbia" and satellite pictures of this area in color (see Exhibit 4).

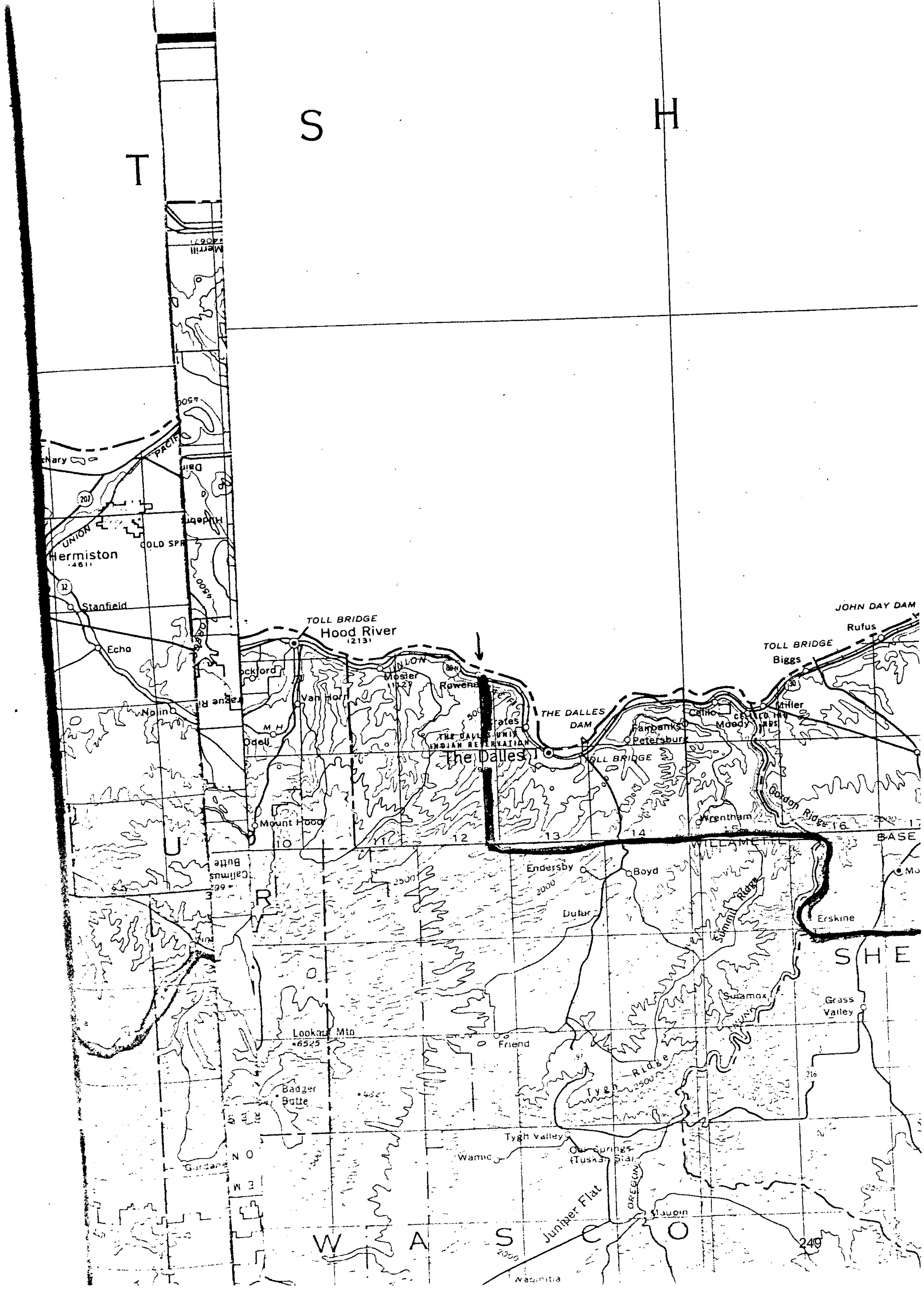
COLUMBIA VALLEY

Revised Narrative Description of the Proposed American Viticultural Area, "Columbia Valley," in Washington State.

The southwest starting point of the appellation is the confluence of the Klickitat and Columbia Rivers at Lyle, Washington. Follow the Klickitat River north four miles to an unnamed canyon, then east up the canyon to the crest of the Columbia Hills. Continue in an easterly direction along the crest of the Columbia Hills to Rock Creek and then northeast roughly along the 2000' contour to Alder Creek. Move down Alder Creek to the 1000' contour, then northeast along 1000' contour to Davis Ranch in the Horse Heaven Hills. Follow the 1000' contour southeast and east to Switzler Canyon, north up Switzler Canyon to Nine Canyon and down Nine Canyon to the 1000' contour. Continue west on the 1000' contour to the intersection with the Yakima Valley Appellation (YVA) boundary at Badger Canyon.

Overlap with the southern boundary of the YVA west to Fort Simcoe Historical State Park, with the western boundary north to Ahtanum Ridge, and with the northern boundary east across Union Gap, Elephant Mountain and the crest of the Rattlesnake Hills to the Yakima-Benton County line. Follow the county line north to Umtanum Ridge, Umtanum Ridge east to the boundary of the Hanford Reservation and the Reservation boundary south to the top of the Rattlesnake Hills. Turn east along boundary to the Yakima River and continue northeast and southeast along the River to its confluence with the Columbia River.

Follow the center of the Columbia River north to West Bar at the intersection of Douglas, Kittitas and Grant County lines. Move northeast up Lynch Coulee to Beexley Hills and east along the crest of Beezley Hills to Ephrata. Follow State Highway 283 southwest from Ephrata to Interstate 90; continue on 90 to the Frenchman Hills. Move east on the crest of the Frenchman Hills to O'Sullivan Dam at the Potholes Reservoir, then south from the dam spillway down Potholes East Low Canal to Paradise Flats, Highway 260 and Connell. Continue south down Esquatzel Coulee to Eltopia, southeast and east aroung the west and south sides of Rye Grass Flat and Sand Dunes (Juniper Forest: Area of Critical Environmental Concern) to Voltaw Siding on the Snake River. Continue southeast roughly along 1000' contour to Eureka, east on State Highway 124 to Touchet River and south down Touchet River to confluence with Walla Walla River. Follow Walla Walla River to confluence with Columbia. Follow center of Columbia west to confluence of Klickitat River at Lyle.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Celilo
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Summit Ridge
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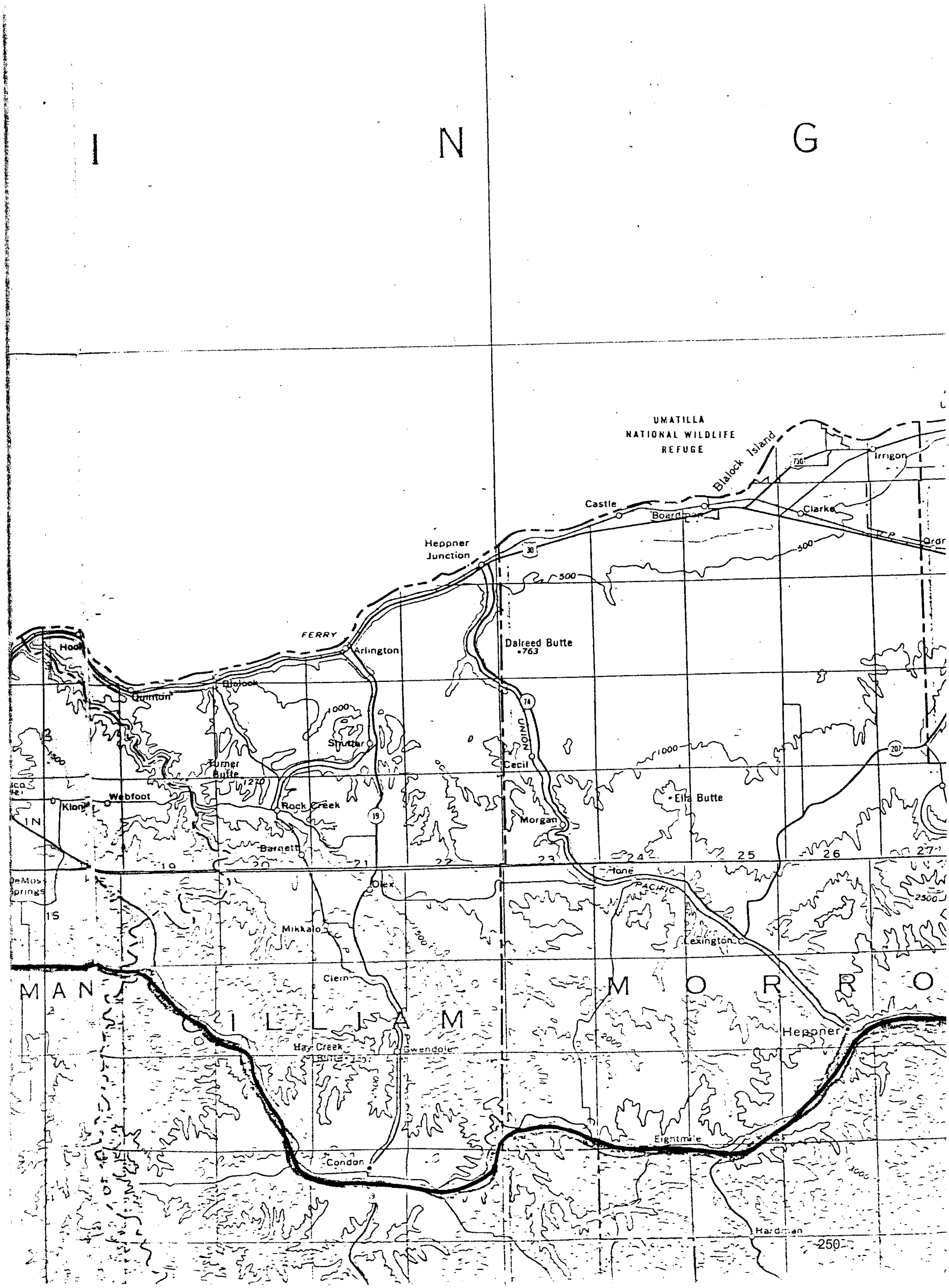
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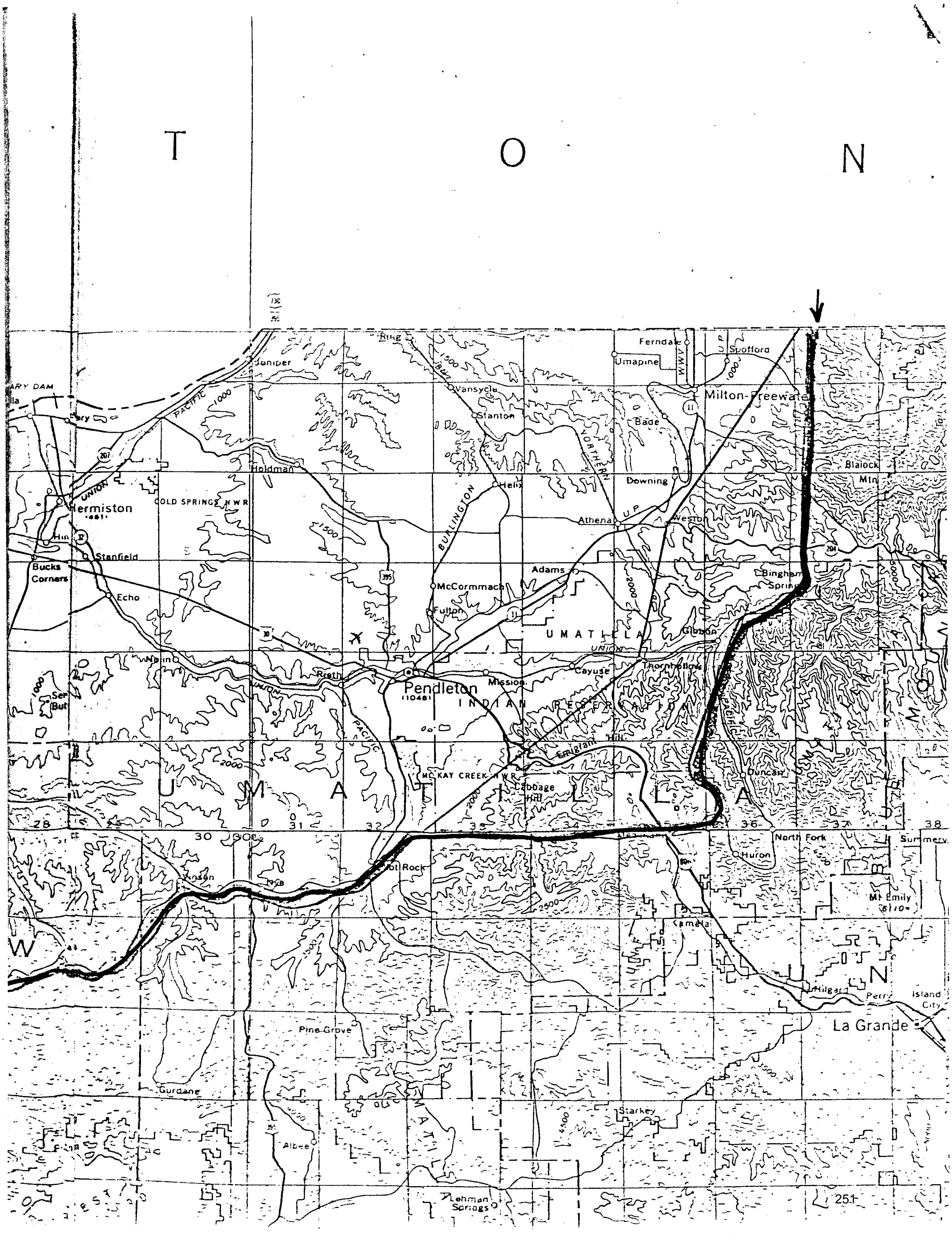
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Weston
Stanfield
Bucks Corners
Echo
Adams
McCormmach
Bingham Springs
Fulton
UMATILLA
Gibbon
Nolin
Rieth
Pendleton
Mission
Cayuse
Thornhollow
INDIAN RESERVATION
Emigrant Hill
MC KAY CREEK NWR
Cabbage Hill
Duncan
U M A T I L L A
North Fork
Summerville
Huron
Pot Rock
Vinson
Nye
Mt Emily
Camela
Hilgard
Perry
Island City
La Grande
Pine Grove
Gurdane
Starkey
Albee
Lehman Springs
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NORTHERN
BURLINGTON
PACIFIC
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EVALUATION OF SELECTED VINEYARD SITES IN WASHINGTON STATE

J.R. Powers
C.W. Nagel
E.L. Proebsting
M. Ahmedullah

College of Agriculture
Research Center
Washington State University

XB 0908

The authors would like to thank the following growers for their co-operation which was essential for this study: Chateau Ste. Michelle Vintners, Mont Elise Winery, Preston Wine Cellars, Sagemoor Farms, Salishan Vineyards, and Mike Sauer.

Evaluation of Selected Vineyard Sites in Washington State

by J. R. Powers,[1] C. W. Nagel,[1] E. L. Proebsting,[2] and M. Ahmedullah[2]

European wine grapes (*Vitis vinifera*) were first planted in central Washington with the development of irrigation systems around 1900. Since that time a number of grape varieties have been grown for the fresh, juice, and wine markets (Folwell and Daily, 1972).

As pointed out by Folwell and Daily (1972) and Nagel and Folwell (1979), both Concord and wine grape plantings have expanded recently in Washington. Approximately 10,400 acres were planted prior to 1968, a total of 18,200 by 1972, and 22,800 by 1978. While the 1978 acreage totals were dominated by Concord (84%), European grape plantings have had a pronounced growth rate with nearly 1,000 acres planted each year between 1975 and 1978.

Grape variety trials were started at the Irrigated Agriculture Research and Extension Center near Prosser in 1937. Since then, over 200 grape varieties have been grown and evaluated. Variety testing at a single site indicated that premium wine grapes could be grown in central Washington. It has been estimated that there are sizeable acreages in central Washington that have potential for wine grape production (Tukey and Clore, 1972; Clore and Nagel, 1969).

The U.S. Department of Agriculture—Agriculture Research Service in 1970 and the Economic Development Administration of the U.S. Department of Commerce in 1972 sponsored research by Washington State University to demonstrate the adaptability of certain wine grapes to Washington and to foster the development of the wine grape industry in the Pacific Northwest. These research efforts resulted in several publications containing valuable information regarding the climate of Washington, cold hardiness of grapes, wine markets, winemaking methodology, and site adaptability.

In 1976 the Pacific Northwest Regional Commission funded the Tri-State Wine Grape Demonstration Project. The objectives of this project included:

a. Investigation of methods for reducing the acidity of wines produced in the Pacific Northwest.
b. Evaluation of selected sites for growing of wine grapes.
c. Provision for scientific and technical resources necessary to solve problems that may be unique to the Pacific Northwest wine grape industry.

This is a report of the Washington portion of the Tri-State Wine Grape Project regarding the evaluation of selected sites for growing wine grapes. Results of other aspects of the project have been published elsewhere.

Methodology

The grape varieties selected for the study were the red varieties Pinot noir and Merlot, and the white varieties Gewurztraminer, Chardonnay, and White Riesling. These varieties were chosen because they were available in established vineyards. Secondly, they represent varieties which vary in ripening date. Pinot noir, Chardonnay, and Gewurztraminer are early season varieties, while Merlot and White Riesling are considered late season varieties (Clore et al. 1976).

To obtain site information, 10 bearing commercial or experimental vineyards in Washington were used. The sites were in southern Washington. The most western site was located near LaCenter, north of Vancouver. This site has a more maritime climate than other sites in this study which are located east of the Cascade Mountains. An intermediate climate is found at the site near White Salmon.

Table 1 shows site names, locations, elevation, slope, soil, and viticultural practices of the sites selected.

Three vines were selected and tagged at each test site for the study. During the 4-5 weeks immediately preceding harvest, grapes were taken

[1]Department of Food Science & Technology, Washington State University, Pullman.

[2]Irrigated Agriculture Research Center, Washington State University, Prosser.

Project number 0050, College of Agriculture Research Center, Washington State University, Pullman. Partial funding provided by the Pacific Northwest Regional Commission.

Table 1. Descriptions of sites used in study.

Name	IAREC B-1	IAREC-Roza	White Salmon	N.W. Pasco	N. Grandview A	LaCenter
Site Location	5 m NE of Prosser	2.5 m N of IAREC	5 m N of White Salmon	13 m NW of Pasco	2.5 m N of Grandview	
Texture	Silt loam	Silt loam	Clay shot loam	Fine sandy loam	Loamy fine sand	Gravelly clay loam
Type	Warden	Shano	Parkhill	Sagemoore	Hezel	Hesson
Trellis	Double curtain	Vertical	High vertical	Vertical	Vertical	Vertical
Training	Cordon	Cordon	Cordon	Cane, Cordon	Fan	Cane
Cover Crop	Spring, fall, winter	Spring, fall, winter	Fall	Fall, winter	Fall, winter	Clean
Irrigation	Furrow	Furrow	Rainfall	Sprinkler	Furrow & sprinkler	Supplemental
Elevation	840′	1100′	1500′	400-750′	830′	425′
Remarks	3% S slope	3% S slope	6-12% S slope	3-10% W & SW slope	5-10% S slope	5% S slope

from the marked vines at weekly intervals. Fruit was analyzed for soluble solids (°Brix), titratable acidity, and pH as described by Carter et al. (1972).

Since a major objective of the study was to evaluate fruit quality from several sites, wine-making procedures were standardized as much as possible. If possible mature fruit was picked as defined in table 2. Wines were made without amelioration using the methods of Nagel et al. (1972). Briefly, the procedures were followed as described below.

White grapes were crushed, stemmed, 100 ppm SO_2 added, and pressed immediately. The juice was allowed to settle overnight at 55° F/13° C, racked off of the sediment and inoculated with a dry Champagne yeast. Fermentation temperature was 55° F. The first racking was done after the initial vigorous stage of fermentation subsided. The musts were fermented to dryness (less than 0.2% residual sugar) in containers with air locks. The wines were promptly racked off the lees and the total SO_2 concentration adjusted to 75 ppm. The wines were racked 2 and 6 weeks after fermentation followed by a standard fining with bentonite (234 gm per 1,000 l). Cold stabilization was carried out at 32° F/0° C for 10-14 days followed by filtration. The free SO_2 was adjusted to 15-20 ppm at the time of bottling.

Red grapes were crushed, 75 ppm SO_2 added, and 2-3 hours later inoculated with a dry yeast (Montrachet in 1976 and 1977, Champagne in 1978). Fermentation was carried out in covered

Table 2. Fruit analyses at which grapes were harvested (optimum maturity).

	Soluble solids (°Brix)	Titratable acidity (% as tartaric acid)	pH
Red	20.5 – 24.0	0.65 – 0.80	< 3.6
White	19.5 – 23.0	0.7 – 0.90	< 3.4

30 gallon containers at 70° F/21° C. The cap was punched down three times a day. The must was pressed between 0° and 5° Balling (generally 5-6 days). Fermentation was finished in full containers with air locks. The wine was racked at the end of fermentation and the SO_2 was adjusted to 75 ppm total. Additional rackings were done 1 and 6 weeks later. Red wines were not fined. Cold stabilization was done as with the white wines. The free SO_2 was adjusted to 15-20 ppm at bottling.

Finished wines were analyzed within 3 weeks of bottling for alcohol (% by volume), titratable acidity, pH, residual sugar and color (A_{520}), using the methods of Amerine and Ough (1974).

Wines were submitted to a 24-member taste panel in April-May following the vintage. No more than six samples were submitted to the panel at each tasting. Generally, only one variety made up a lot. The Davis 20 point scale was used (Ough and Baker, 1961). The panel was split into four groups. The wines were presented in a random order, with the order being different for each of the four groups. The 1977 and 1978 data were analyzed statistically to determine significance.

Table 1. (cont'd.).

Name	Cold Creek	N. Grandview B	White Swan	N. Pasco
Site Location	16 m N of Sunnyside	8 m NE of Grandview	7 m NW of Harrah	5 m N of Pasco
Texture	Very fine sandy loam	Fine sandy loam	Sandy loam	Loamy sand
Type	Warden	Sagemoor	Sagemoor	Quincy
Trellis	Vertical	Vertical	Vertical single	Vertical
Training	Fan	Fan	Cordon	Cordon
Cover Crop	Clean	Clean	Weeds	Weeds
Irrigation	Sprinkler	Sprinkler	Sprinkler	Sprinkler
Elevation	1200′	1100′	1250′	450′
Slope	3% SSE slope	3% S slope	5% W slope	2% S slope

Results and Discussion

While table 1 describes the sites used in this study, the differences in climate among the sites are shown by heat unit accumulation data shown in table 3. The sites examined range from a low Region I climate (less than 2,500 heat units), to a moderate-to-high Region I at Prosser, to a high Region II (2,500-3,000 heat units), to a low Region III (3,000-3,500 heat units) at the North Pasco, N.W. Pasco, and Cold Creek sites (table 3 and Ledwitz, 1975). A general statement can be made with regard to the importance of slope and irradiation. Generally a south slope is preferred due to increased exposure to the sun. For example, at 46° N. latitude (the approximate latitude of the areas under study) a 10% south slope receives as much radiation during the April-October growing season as a horiozntal point at 40.3° N. (Frank and Lee, 1966). More important, late season radiation is much greater on a south slope than at a horizontal point. For example, at 46° N. a 10% south slope receives 13.4% greater radiation on October 8 than does a horizontal point at the same latitude.

Table 4 lists the must analyses from the various sites. In general, each variety reached an ac-

Table 3. Heat unit* summary for growing season (April-October) at selected weather stations.

Year	Eltopia	Moxee	Prosser	Richland	Sunny-side	White Swan	Yakima Airport	Dalles-port	LaCenter
1976	2155	–	2087	–	2449	2079			
1977	2381	2016	2440	3349	2787	–	2192		
1978	2158	1800	2200	3067	2599	2461	2050	3118	
1964-73 average†			2462	3230					1680
50 year average‡ (1923-1973)			2393						

*Based on the monthly mean temperature above 50° F times the days in the month.
†From Ledwitz, M. W. 1975. Washington state climatology for grape production, in Technical and economic assistance in fostering the economic development of the wine-grape industry of Washington.
‡From Clore, W. J. Nagel, C. W., and Carter, G. H. 1976. Ten Years of Grape Variety Responses and Winemaking Trials in Central Washington. Washington State University Research Bulletin XB 0823.

Table 4. Must analyses among tested varieties at various sites.

Site	Harvest date	Yield (T/A)	S.S. (° Brix)	T.A. (%)	pH
		White Riesling			
		1976			
Cold Creek	10/11	4.5	24.3	0.72	3.22
North Pasco	10/22	10.1	20.8	1.18	3.14
N. Grandview A	10/25	13.6	17.2	1.11	3.16
White Salmon*	10/29	2.3	22.4	0.79	3.02
White Swan	10/19	9.4	21.9	0.95	3.12
IAREC-Roza	10/19	14.4	22.4	1.16	2.92
N.W. Pasco*	10/4	5.3	20.1	1.01	2.98
LaCenter	11/4	1.5	20.5	1.31	—
		1977			
Cold Creek*	10/4	—	22.4	1.04	3.02
North Pasco	10/27	6.1	20.1	1.33	3.02
N. Grandview A	10/20	7.8	23.5	1.08	2.97
White Salmon	10/20	7.1	24.8	1.14	3.06
IAREC-Roza	10/24	7.8	24.3	1.11	3.01
N.W. Pasco	10/20	7.1	22.0	1.02	3.03
LaCenter*	10/28	—	17.3	1.80	2.95
		1978			
Cold Creek	10/13	9.6	23.6	1.14	3.16
North Pasco	10/17	8.3	22.4	1.04	3.15
N. Grandview A	10/17	6.6	23.6	0.96	3.19
White Swan	10/25	10.6	20.8	0.89	2.94
IAREC-Roza	10/23	14.2	23.2	1.22	2.95
N.W. Pasco	10/24	14.2	22.8	1.06	3.04
LaCenter*	10/23	—	21.5	1.08	3.15
		Gewürztraminer			
		1976			
Cold Creek	9/13	4.4	22.9	0.53	3.64
North Pasco	10/12	8.6	19.8	0.71	3.41
White Salmon*	10/29	—	24.5	0.63	3.35
White Swan	9/22	6.5	22.5	0.68	3.40
IAREC-Roza	10/1	9.4	21.9	0.80	3.30
N.W. Pasco	10/5	6.3	22.5	0.71	3.73
		1977			
Cold Creek	9/22	5.7	22.2	0.53	3.71
North Pasco	10/17	4.2	23.1	0.74	3.63
White Salmon	10/28	—	21.0	0.93	3.41
White Swan	10/7	7.6	24.3	0.76	3.60
IAREC-Roza	9/15	9.7	21.8	0.62	3.48
N.W. Pasco	10/7	7.2	23.7	0.53	3.77
LaCenter*	10/28	—	17.9	1.34	3.16
		1978			
Cold Creek	9/22	4.9	22.0	0.61	3.39
North Pasco	9/27	4.5	22.3	0.84	—
White Salmon	10/26	2.2	24.5	0.61	3.56
White Swan	9/20	3.8	22.4	0.74	3.32
IAREC-Roza	10/5	14.7	22.6	0.90	3.41

Table 4. (cont'd.).

Site	Harvest date	Yield (T/A)	S.S. (° Brix)	T.A. (%)	pH
N.W. Pasco	9/29	10.8	20.5	0.86	3.50
LaCenter	10/28	1.0	21.3	0.99	3.25
		Chardonnay			
		1976			
Cold Creek	9/20	1.8	23.1	1.30	3.23
North Pasco	10/22	6.8	19.8	1.22	3.25
IAREC-Roza	10/6	7.6	22.7	1.07	3.45
N.W. Pasco	10/5	6.0	20.8	1.12	3.30
		1977			
Cold Creek	10/4	—	23.1	1.02	3.29
North Pasco	10/27	3.6	20.1	1.36	3.22
IAREC-Roza	9/29	—	22.2	1.05	3.12
N.W. Pasco	10/10	—	22.9	0.92	3.43
White Swan	10/7	3.9	25.9	1.37	3.43
		1978			
Cold Creek	10/3	6.9	24.8	1.24	3.30
North Pasco	10/17	2.9	24.3	1.22	3.29
IAREC-B-1	10/10	5.4	25.5	1.26	3.24
N.W. Pasco	10/17	9.0	24.1	1.13	3.33
White Swan	10/3	3.8	24.4	0.97	3.34
		Merlot			
		1976			
Cold Creek	9/17	2.5	23.2	0.78	3.59
North Pasco	10/4	7.8	19.1	0.72	3.46
N. Grandview A	10/7	—	19.8	0.79	3.30
IAREC-Roza	10/20	11.7	22.9	0.68	3.41
N.W. Pasco*	10/4	—	21.7	0.65	3.60
LaCenter*	11/4	—	20.6	0.72	3.18
		1977			
Cold Creek	9/22	5.1	23.4	0.72	3.73
North Pasco*	10/20	—	22.8	0.91	3.41
N. Grandview A*	10/11	—	24.4	0.72	3.51
IAREC-Roza	10/13	4.0	24.9	0.87	3.40
N.W. Pasco	10/17	6.0	24.5	0.68	3.60
		1978			
Cold Creek	9/29	5.7	25.9	0.82	3.44
North Pasco	10/9	6.1	24.5	0.84	3.74
N. Grandview A	10/12	8.8	24.0	0.72	3.45
IAREC-Roza	10/11	11.3	24.3	1.05	3.36
N.W. Pasco	10/9	10.4	25.3	0.74	3.61
LaCenter*	10/25	—	22.8	1.01	3.22
		Pinot noir			
		1976			
Cold Creek	9/29	4.9	20.2	0.67	3.60
North Pasco	10/22	8.1	22.2	0.85	3.73
White Salmon	10/29	2.4	21.0	0.94	3.55
N. Grandview B	10/8	7.9	22.3	0.77	3.38
White Swan	9/29	4.7	19.8	0.89	3.59

Table 4. (cont'd.).

Site	Harvest date	Yield (T/A)	S.S. (° Brix)	T.A. (%)	pH
IAREC-Roza	10/13	14.0	21.9	0.89	3.40
N.W. Pasco	10/4	6.0	20.0	0.77	3.48
LaCenter	10/12	—	21.1	1.13	3.59
		1977			
Cold Creek	9/22	3.6	23.4	0.72	3.73
North Pasco	10/17	—	24.2	0.92	3.83
White Salmon*	10/5		21.5	0.98	3.62
White Swan	10/10	4.9	22.0	0.80	—
IAREC-Roza	10/7	5.5	22.4	1.00	3.50
N.W. Pasco	10/17	7.1	24.3	0.81	3.72
LaCenter*	10/28	—	18.1	1.61	3.31
		1978			
Cold Creek	9/28	6.5	22.2	0.92	3.60
North Pasco	9/29	2.9	22.9	1.35	3.54
White Salmon	10/26	2.2	23.8	0.90	3.66
N. Grandview B	9/29	4.5	22.4	0.99	3.37
White Swan	9/29	3.7	21.6	0.86	3.48
IAREC-Roza	10/3	12.2	21.9	1.28	3.27
N.W. Pasco	10/9	10.3	21.8	0.89	3.63
LaCenter	10/28	1.2	25.0	0.90	3.58

*Not made into wine.

ceptable soluble solids content. Exceptions included White Riesling at the North Grandview A site (1976), and White Riesling (1976), Gewurztraminer (1977), and Pinot noir (1977) at the LaCenter site. The lack of adequate maturity at the North Grandview A site was probably due to overcropping in a relatively cool year.

White Riesling was harvested from early mid-October (Cold Creek) to late October-early November (LaCenter) reflecting the climate at these sites. The White Riesling fruit at harvest were characterized by high titratable acidity and low pH. This is of practical importance since if the pH is low there are neutralization methods available to reduce excessive acidity. The White Riesling data were analyzed by calculating the regression of soluble solids on the sampling date to establish a normal slope as shown in figures 1 and 2. Each site was represented by a calculated date that the grapes reached 20% soluble solids and by the percent soluble solids on September 1. These values were then plotted against yield. Figures 1 and 2 give the results for White Riesling grown in central Washington (i.e., does not include LaCenter and White Salmon sites). Note the linearity of the plot indicating a highly significant negative correlation between yield and percent soluble solids on September 1 (fig. 1). Also significant are the positive relationships between date to reach 20% soluble solids and yield (fig. 2). These relationships would be expected if these data were from a single site. These data, however, are from several distinct areas which vary in heat accumulation. Thus, variation in climate of site can be largely overcome by cropping practices.

In general, Gewurztraminer was harvested in mid-September to early October within acceptable sugar and acid ranges. Exceptions were the cooler White Salmon and LaCenter sites which were harvested in late October. The latter site did not reach acceptable sugar-acid levels in 1977. The fruit analyses were characterized as moderate in acid and of variable pH. High pH (above 3.6) was noted 2 of 3 years at the Cold Creek and N.W. Pasco sites and 1 of 3 years at the North Pasco site.

Chardonnay, as has been noted in earlier work in Washington (Clore et al., 1976), tended to produce fruit of high acidity even when harvested at greater than 24° Brix. The pH of the fruit was moderate. A lower pH to allow partial neutralization of the high titratable acidity would be desirable.

Merlot fruit were harvested over a 3-4 week

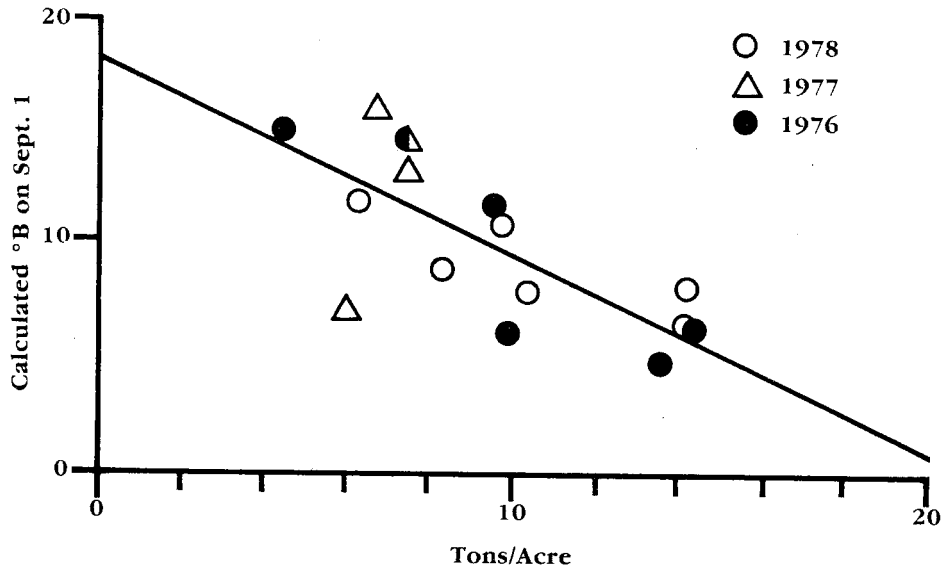

Fig. 1. White Riesling, calculated degrees Brix on Sept. 1 versus yield (tons/acre) from a computer generated best-fit line drawn.

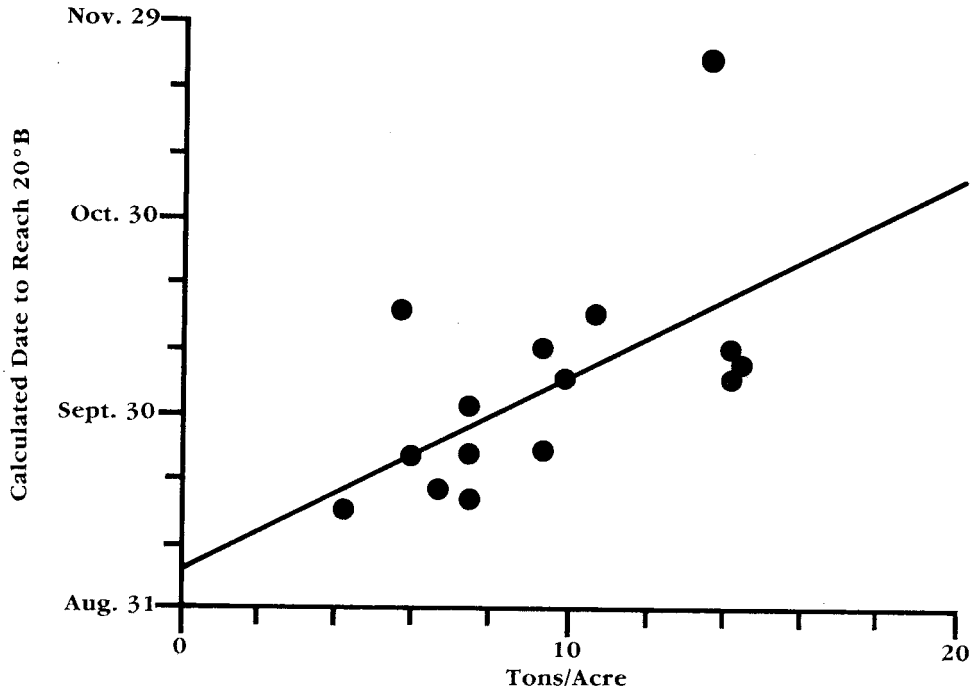

Fig. 2. White Riesling, calculated date to reach 20° Brix versus yield (tons/acre) from a computer generated best fit line drawn.

period at the sites studied. In 1978, musts from the IAREC-Roza and LaCenter sites exceeded 1% acidity. The former site was heavily cropped (11.3 T/A).

Pinot noir generally ripened in late September to mid-October at the central Washington sites. In the cool year of 1976 soluble solids tended to be low, in the 20%-22% range. In certain cases this variety tended to have high pH while retaining relatively high titratable acidity. For example, the North Pasco, Cold Creek, and N.W. Pasco sites produced fruit pH's above 3.6, while TAs exceeded 0.8%. In 1978 there was a considerable number of high TA musts regardless of site.

The analytical data for the finished wines are presented in table 5. In general, these analyses reflect the must data in table 4. The titratable acidity is usually slightly reduced in the wines as compared to the musts, due to the removal of potassium acid tartrate by precipitation during the winemaking process.

The White Riesling wines tended to be high in titratable acidity and low in pH. As noted previously, these wines may be improved by neutralization during vinification. Regardless of site, however, the wines did score fairly well. Some of these wines did not ferment to dryness, making taste panel analysis difficult. The 1976 North Grandview A and LaCenter wines were relatively low in alcohol and score, reflecting immature fruit. Nevertheless, there was little difference in panel scoring of White Riesling wines from the sites.

Gewurztaminer wines were generally of moderate acid level with a considerable variation in pH. The N.W. Pasco wines were quite high in pH in 2 of 3 years. This can lead to several problems. High pH wines are less stable microbiologically, and, there is a tendency for taste panels to score these wines poorly (Nagel & McElvain, 1976). There was a moderate variation in panel scoring of Gewurztraminer wines. The North Pasco and IAREC-Roza sites produced high scoring wines in each of the 3 years, while in 1977 and 1978 the Cold Creek and N.W. Pasco sites produced high pH wines which received low scores.

Chardonnay wines were high in titratable

Table 5. Wine analyses.

Site	Alcohol (%)	(%) T.A.	pH	Reducing sugar (%)	Score
		White Riesling			
		1976			
Cold Creek	13.7	0.74	3.16	1.04	14.5
North Pasco	11.7	0.99	3.01	0.09	14.0
N. Grandview A	9.6	1.04	2.88	0.07	13.9
White Swan	12.5	0.93	3.12	0.13	16.7
IAREC-Roza	13.1	0.91	2.83	0.38	15.0
LaCenter	10.8	1.17	3.02	0.10	13.5
		1977			
North Pasco	11.4	1.01	3.05	0.12	14.1
N. Grandview A	13.8	0.90	2.91	0.42	15.6
White Swan	14.3	0.91	3.06	0.53	15.3
IAREC-Roza	11.3	0.90	2.90	1.51	14.4
N.W. Pasco	12.8	0.86	2.98	0.22	15.8
		1978			
Cold Creek	13.9	0.85	3.14	0.23	15.4
North Pasco	13.4	0.88	3.01	0.10	14.4
N. Grandview A	14.5	0.81	3.08	0.25	15.4
White Swan	12.4	0.79	2.97	0.12	16.0
IAREC-Roza	13.1	1.13	2.95	0.50	15.4
N.W. Pasco	13.9	0.87	3.12	0.23	15.5

Table 5. (cont'd.).

Site	Alcohol (%)	(%) T.A.	pH	Reducing sugar (%)	Score
		Gewürztraminer			
		1976			
Cold Creek	13.6	0.64	3.42	0.19	15.2
North Pasco	11.6	0.65	3.45	0.08	15.8
White Swan	13.4	0.68	3.56	0.08	14.4
IAREC-Roza	12.9	0.79	3.21	0.18	16.0
N.W. Pasco	13.2	0.67	3.80	0.10	15.3
		1977			
Cold Creek	13.0	0.38	3.67	0.11	13.2
North Pasco	13.4	0.42	3.12	0.38	15.0
White Salmon	12.5	0.76	3.41	0.02	14.5
White Swan	14.3	0.56	3.49	0.16	15.8
IAREC-Roza	13.4	0.52	3.25	0.15	15.5
N.W. Pasco	13.7	0.41	3.92	0.31	14.1
		1978			
Cold Creek	12.5	0.56	3.46	0.12	14.3
North Pasco	12.6	0.67	3.93	0.29	15.1
White Salmon	14.2	0.67	3.44	0.15	15.4
White Swan	13.2	0.58	3.24	0.06	15.4
IAREC-Roza	13.4	0.78	3.50	0.13	16.1
N.W. Pasco	11.7	0.70	3.65	0.28	11.5
LaCenter	12.2	0.82	3.23	0.21	12.8
		Chardonnay			
		1976			
Cold Creek	13.4	1.15	3.23	0.38	14.5
North Pasco	11.2	1.08	3.33	0.10	14.9
IAREC-Roza	13.3	0.92	3.21	0.26	15.7
N.W. Pasco	11.1	0.90	3.17	0.23	15.2
		1977			
North Pasco	12.3	1.06	3.47	0.19	14.4
IAREC-B-1	13.8	0.89	3.31	1.38	14.6
N.W. Pasco	12.3	0.79	3.50	0.34	14.1
White Swan	12.8	0.91	3.54	0.30	15.9
		1978			
Cold Creek	15.1	1.04	3.45	0.17	15.0
North Pasco	14.0	1.06	3.67	0.17	14.7
IAREC-B-1	15.5	0.98	3.38	0.23	15.2
N.W. Pasco	13.1	0.98	3.72	0.38	15.1
White Swan	14.7	0.79	3.45	0.10	14.2
		Merlot			
		1976			
				A_{520}	
Cold Creek	12.5	0.71	3.59	3.43	15.3
North Pasco	11.0	0.77	3.42	2.48	15.8
IAREC-Roza	13.0	0.81	3.44	3.51	15.7
		1977			
Cold Creek	12.5	0.51	3.61	2.10	15.1
IAREC-Roza	13.0	0.76	3.52	2.47	15.2
N.W. Pasco	12.8	0.60	3.69	2.11	13.7

Table 5. (cont'd.).

Site	Alcohol (%)	(%) T.A.	pH	A_{520}	Score
		1978			
Cold Creek	14.3	0.68	3.48	7.07	16.4
North Pasco	13.6	0.69	3.97	2.45	13.4
N. Grandview A*	13.5	0.71	3.40	6.73	16.3
IAREC-Roza	13.3	0.86	3.40	4.52	15.5
N.W. Pasco	13.8	0.67	3.73	2.71	16.0
		Pinot noir			
		1976			
Cold Creek	10.7	0.70	3.33	0.62	12.5
North Pasco	12.0	0.75	3.66	0.47	9.8
White Salmon	10.9	0.79	3.49	1.00	14.1
N. Grandview B	12.6	0.79	3.39	0.88	12.6
White Swan	9.7	0.77	3.33	0.88	13.4
IAREC-Roza	12.3	0.77	3.26	0.49	11.4
N.W. Pasco	10.1	0.70	3.32	—	11.1
LaCenter	10.6	0.88	3.43	1.00	11.7
		1977			
Cold Creek†	12.0	0.50	3.49	0.45	13.3
North Pasco	11.8	0.67	3.99	0.49	11.3
White Swan	10.9	0.64	3.61	0.46	11.4
IAREC-Roza†	12.4	0.68	3.51	0.70	11.1
N.W. Pasco	13.0	0.62	3.86	0.40	11.4
		1978			
Cold Creek	11.8	0.74	3.41	1.76	16.4
North Pasco*	12.6	0.69	4.08	1.22	14.2
White Salmon	12.6	0.44	4.15	1.24	14.8
N. Grandview B	11.9	0.76	3.48	1.21	13.9
White Swan	11.6	0.74	3.58	1.32	14.6
IAREC-Roza	11.5	0.86	3.39	0.92	14.1
N.W. Pasco	9.2	0.47	4.03	0.32	8.8
LaCenter	12.8	0.72	3.81	2.08	16.8

*Malo-lactic fermentation.

†High SO_2 content.

acidity regardless of site. There were high pH's in the North Pasco and N.W. Pasco wines in 1978. These wines, however, did not score significantly lower than other wines tasted.

Merlot wines were direct reflections of their must analyses seen earlier. Wines were quite consistent in analyses with relatively small variation in panel score. The North Pasco 1978 wines scored poorly, probably a reflection of the high pH and relatively poor color.

Pinot noir varied most in wine analyses of the varieties in this study. Note that color was quite variable in these wines. Taste panel score was significantly correlated with color as shown in figure 3. Few of the wines in this study scored well. It has previously been noted that Pinot noir does not produce highly colored wines when grown in most of central Washington (Clore et al., 1976).

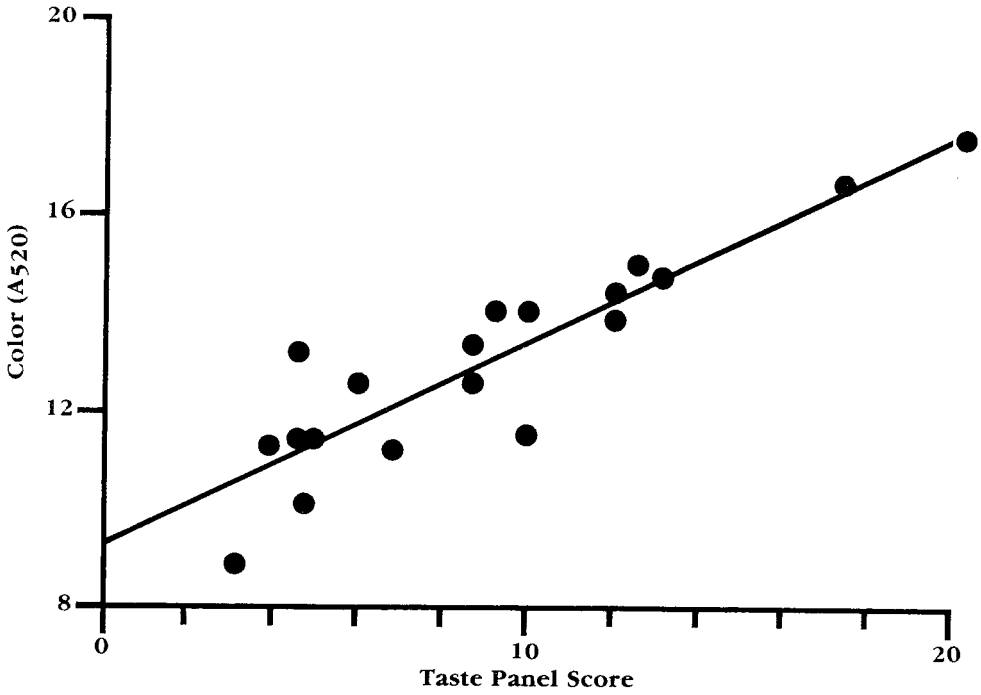

Fig. 3. Taste panel score of Pinot noir wines versus color of wine. Line drawn is based on linear regression treatment of data.

Summary

The Washington State areas examined range from a low Region I climate at LaCenter, to a high Region I at Prosser, to a high Region II or low Region III at North Pasco, N.W. Pasco, and Cold Creek.

The varieties tested: White Riesling, Gewurztraminer, Chardonnay, Merlot, and Pinot noir generally reached sugar levels acceptable for wine production. Exceptions occurred at the coolest site studied (LaCenter) or when overcropping took place. The relatively late harvest dates at the LaCenter site increases the probability of fall rains and subsequent rot of fruit.

White Riesling fruit and wines from the sites were high in titratable acidity and low in pH. The wines scored fairly well regardless of site. These data suggest that White Riesling can be successfully grown throughout the central Washington study area.

Gewurztraminer at the sites studied produced fruit and wines with moderate acidity and a fairly wide range in pH. Site is apparently a factor in determining wine quality for this variety since the N.W. Pasco and Cold Creek sites tended to produce high pH and hence low scoring wines. The causes for site related high pH wines is presently under study.

Chardonnay produced high T.A. fruit and wines regardless of site. Chardonnay wines, however, were scored fairly well by the taste panel.

Merlot produced well-balanced fruit and wines at all sites studied. This variety produced high quality wines at all sites.

Pinot noir appears to be the one variety examined in this study which is not well adapted to central Washington. Few Pinot noir wines produced in this study scored well. Clones of this variety and/or variations in method of vinification need to be explored to bring this variety to high quality in central Washington.

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Sokol Blosser Winery SB
P.O. Box 199, Blanchard Lane
Dundee, Oregon 97115
(503) 864-3342 or 864-2307

9 Sept 1982

Mr Charles Bacon
Research Section
Bureau of ATF
1200 Pennsylvania Ave NW
Washington, DC 20226

Dear Mr Bacon:

Pursuant to our phone conversation today, I thought it would be best if I wrote you immediately regarding the proposed Columbia Valley appelation. After I receive a copy of the proponent's application, I may have further things to add.

An ad hoc group of industry people has been working for a year or so on the idea of a Columbia Valley or Columbia River Valley appelation. The idea was to include in it all of the area along the river with similar viticultural characteristics. As it turns out, all study we have done on this has shown that the viticultural area must include land on both sides of the river: i.e. in Washington and Oregon. An argument can be made to include some areas of Idaho too, but this is more tenuous. Only by ignoring climate, geography, current grape plantings, soils, and history could one ever come to the conclusion that a viticultural area should stop in the middle of the river at the state boundary. Apparently, this is what the petitioner has tried to do. Such a boundary makes sense from a very narrow self-interest point of view, but is nonsense from a viticultural point of view.

I am attaching one study that was done as a basis for defining the viticultural boundaries. A similar study was done by Dr Walter Clore in Prosser, WA. Reportedly it comes to exactly the same conclusion, but I have not seen it yet. I thought you might also be interested in the attached letter from St Michelle Winery, which was circulated to all wineries and vineyards. It, too, calls for a bi-state viticultural area.

Thank you very much for offering to send me a copy of the petition.

Sincerely,

William R. Blosser

Chateau Ste Michelle

Grandview Winery
Post Office Box 580
Grandview, Washington 98930
509/882-3928

March 5, 1982

To whom it may concern:

Ste. Michelle Vintners is pursuing a viticultural appellation for southcentral Washington. Many consumers, especially those outside the state, equate Washington to cool, wet and green, and question its suitability for premium wine production. Our intent is to create a more specific appellation that will allow greater emphasis on the actual geography and climate of the grape growing region.

Dr. Walt Clore is working with us in compiling the historical and climatological data needed for such a proposal to BATF. The critical features of this proposal are 1) a name for the appellation, 2) historical evidence to link the name to the proposed area, 3) historical evidence to tie grape growing to the area, 4) geographical, climatological and/or soil data that demonstrates the uniqueness of the area from surrounding areas, and 5) ability to define the area on U.S. Geological Survey maps.

Our preliminary research indicates that land in vicinity of the Snake and Columbia Rivers and the Yakima Valley should be included. Probable boundaries would be the Columbia Gorge (Dalles) and Cascade foothills to the west, the land in Oregon immediately adjacent to the Columbia River to the south, the Columbia River between Chelan and Grand Coulee to the north, and a line drawn from Grand Coulee to Connell approximating the 1300' topographic line to the east. There would be an arm extending from Connell east along the Snake River to the Idaho border and returning to the Oregon border along the west foothills of the Blue Mountains. This encompasses land with 150 or more frost-free days, 2000 or more Heat Units, and moderate winter temperatures.

Since BATF will request comments and possibly a hearing on this proposal, we would like to hear your comments prior to submitting it. If you have any thoughts on a name for the region, suggestions on boundaries, or historical references about grapes or wines, please send them to me. Since we plan to draw up a rough draft by April and submit the proposal by summer, we would appreciate your prompt response.

Sincerely,

Wade H. Wolfe

Wade H. Wolfe
Viticulturist

Warren W. Aney
Rt 1, Box 1520
La Grande, OR 97850
25 February 1982

Bill Blosser
Sokol Blosser Winery
PO Box 199
Dundee, OR 97115

Methods. I've chosen to use expected 20-year minimum temperatures, frost-free days and April-October degree days as defining climatological variables. These variables were mapped (see enclosed maps).

Since federal regulations appear to require boundaries that can be found on a U.S. Geological Survey (USGS) map, I also included elevation as a variable although I haven't yet mapped this variable. Annual precipitation is also included to round out area descriptions, but it is not used as a defining variable.

My 1974 paper also used 20-year minimum temperatures and frost-free days in the same way that I am now using them. But instead of degree-days, I originally used a potential evapotranspiration index because it corrects for latitudinal differences in day length (which a degree-days type index does not do). But in this application I decided to use degree-days for a number of important reasons:

- A degree-days index is more easily understood by more persons and is more commonly used in American viticultural literature (e.g., Winkler).

- There are several ways for calculating or measuring potential evapotranspiration, each of which can produce different answers with varying accuracy and precision (I used Thornthwaite's index in my 1974 paper because it is one of the oldest and most widely used methods, but it is not the most accurate; the data you sent me is from another method and gives slightly different results than Thornthwaite's index).

- For this study, degree-days is nearly as informative as potential evapotranspiration since there are no great differences in latitude and day-length in the Pacific Northwest, i.e., we are talking about a maximum difference of 7° latitude or about 3% more daylight in the longest day of the year. But degree-days would not work well for comparing Napa Valley (38° latitude) with the Mosel (50°) where there is 11% more daylight in the longest day.

- Potential evapotranspiration indexes are difficult to calculate without a computer.

Results. These environmental variables define the Pacific Northwest's major viticultural regions and subregions as described below. The Cascades Mountain Range divides the Pacific Northwest into two major climatological influences---a moderate, moist coastal areawhere lack of summer ripening heat is the factor determining where vinifera grapes can be successfully grown; and a more severe, dry interior where frost and

winter cold are the determining factors. So vinifera grapes can be and are being grown successfully in a number of areas which I define and describe as follows (see also the enclosed map of viticultural areas):

b. Columbia Basin[a] region. Characterized by low precipitation, hot summers and cold winters. This is that part of the Columbia River drainage east of the Cascades with a frost-free season of at least 160 days.

1. Celilo subregion - along both banks of the Columbia River from Hood River on the west to Arlington[b] on the east.
   - elevation not greater than 150 m (500 ft)
   - expected 20-year minimum no lower than -33°C (-27°F)
   - growing season at least 160 days
   - at least 2000 degree-days

2. Umatilla-Yakima subregion - from Arlington[b] on the Columbia up the Columbia and Yakima valleys to Yakima[b]
   - elevation not greater than 300 m (1000 ft)
   - expected 20-year minimum no lower than -32°C (-26°F)
   - growing season at least 170 days
   - at least 2400 degree-days

3. Wenatchee subregion - Columbia River valley from Wanapum Dam[b] upriver to Wenatchee and Ephrata
   - elevation not greater than 400 m (1300 ft)
   - expected 20-year minimum no lower than -32°C (-26°F)
   - growing season at least 180 days
   - at least 2400 degree-days

4. Nez Perce subregion - Snake River valley from Lower Granite Dam[b] upriver to the Grande Ronde River[b]
   - elevation not greater than 300 m (1000 ft)
   - expected 20-year minimum temperature no lower than -32°C (-26°F)
   - growing season at least 160 days
   - at least 2400 degree-days

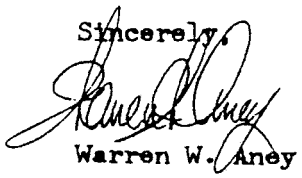
Discussion. As I mentioned earlier, vinifera grapes are grown successfully in all these areas but there are a lot of questions about the limits and extent of these areas that will only be answered through trial and experience. Also, there is insufficient climatological information and viticultural experience to adequately predict the suitability of the area along the Columbia River between John Day Dam and Boardman (between the Celilo and Umatilla-Yakima subregions). Lack of such information is also a problem for the Columbia River valley above the mouth of the Yakima River and the Snake River valley below Lewiston.

Some areas such as the Upper Snake are so marginal in one or more climatic factors that it is possible only carefully selected spots with optimal local climates can be reasonable expected to produce dependable viticultural reults. Finally, the very high degree-days reported for some Columbia Basin stations suggests too much summer heat may be a factor to consider in some areas right along the Columbia River (Umatilla-McNary locality with 3265 degree-days, Paterson station with 3411, Priest Rapids Dam with 3680 and Wahluke station with 3920).

The region and subregion names I have chosen are rather tentative and arbitrary at this point, but I did try to use generally accepted and currently used names, favoring Indian related names for the more specific subregions. I believe Willamette and Umpqua are commonly used names by winegrowers in those areas but Siskiyou and Celilo may not be. The latter could be Klickitat-Wasco, the names of two of the principal counties involved (as is the case with Umatilla-Yakima).

I would welcome any additional information or suggestions anyone can provide that will help us in this process. If what you see here is generally acceptable, I'll start refining it and preparing better graphics (for example, I will have to map these areas on standard USGS maps).

Sincerely,



Warren W. Aney

Footnotes:

[a] These names are land form provinces described on page 34ff, Atlas of the Pacific Northwest (Oregon State University Press, 1979)

[b] Geographical limit is not well-defined in terms of viticultural suitability.

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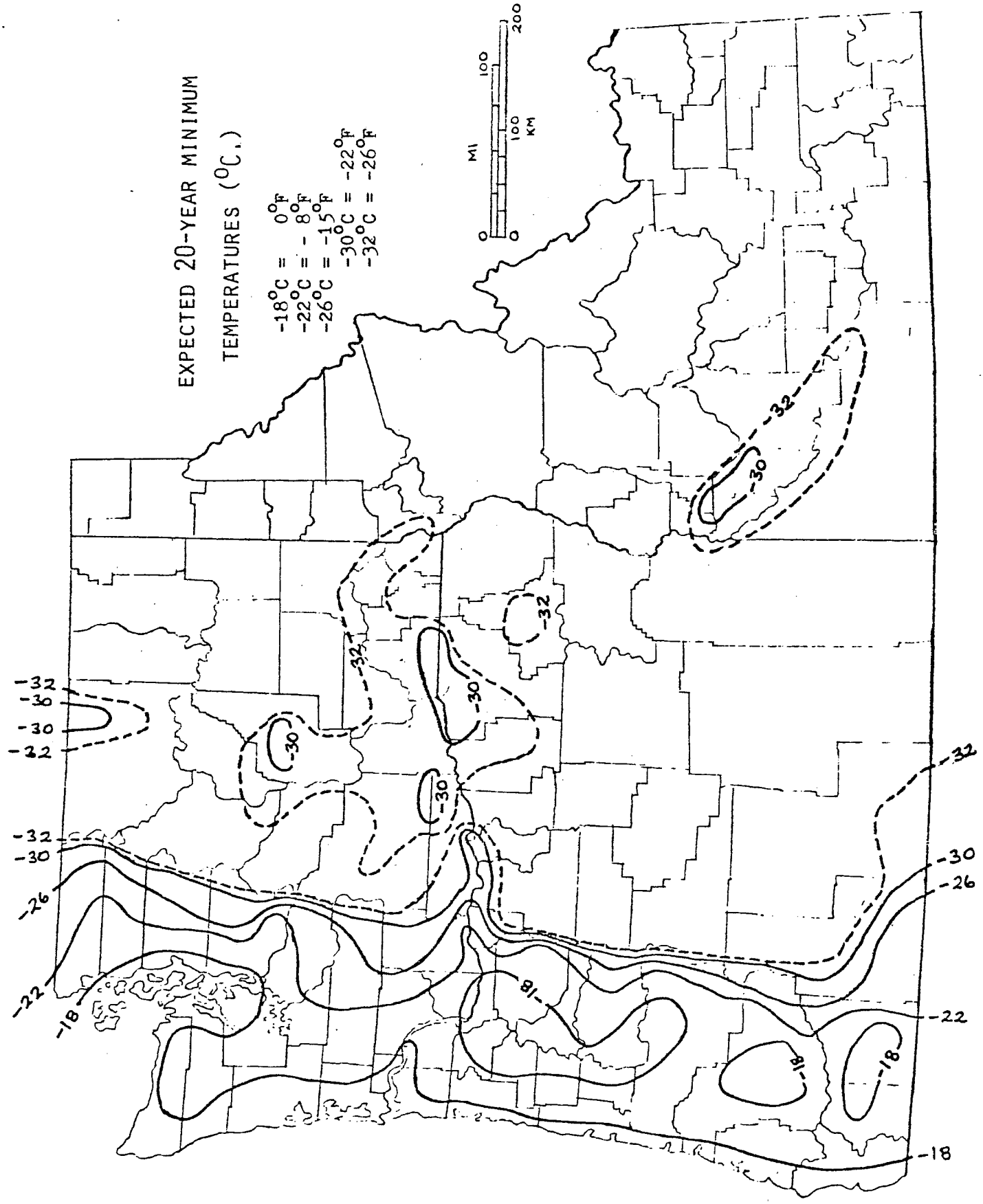
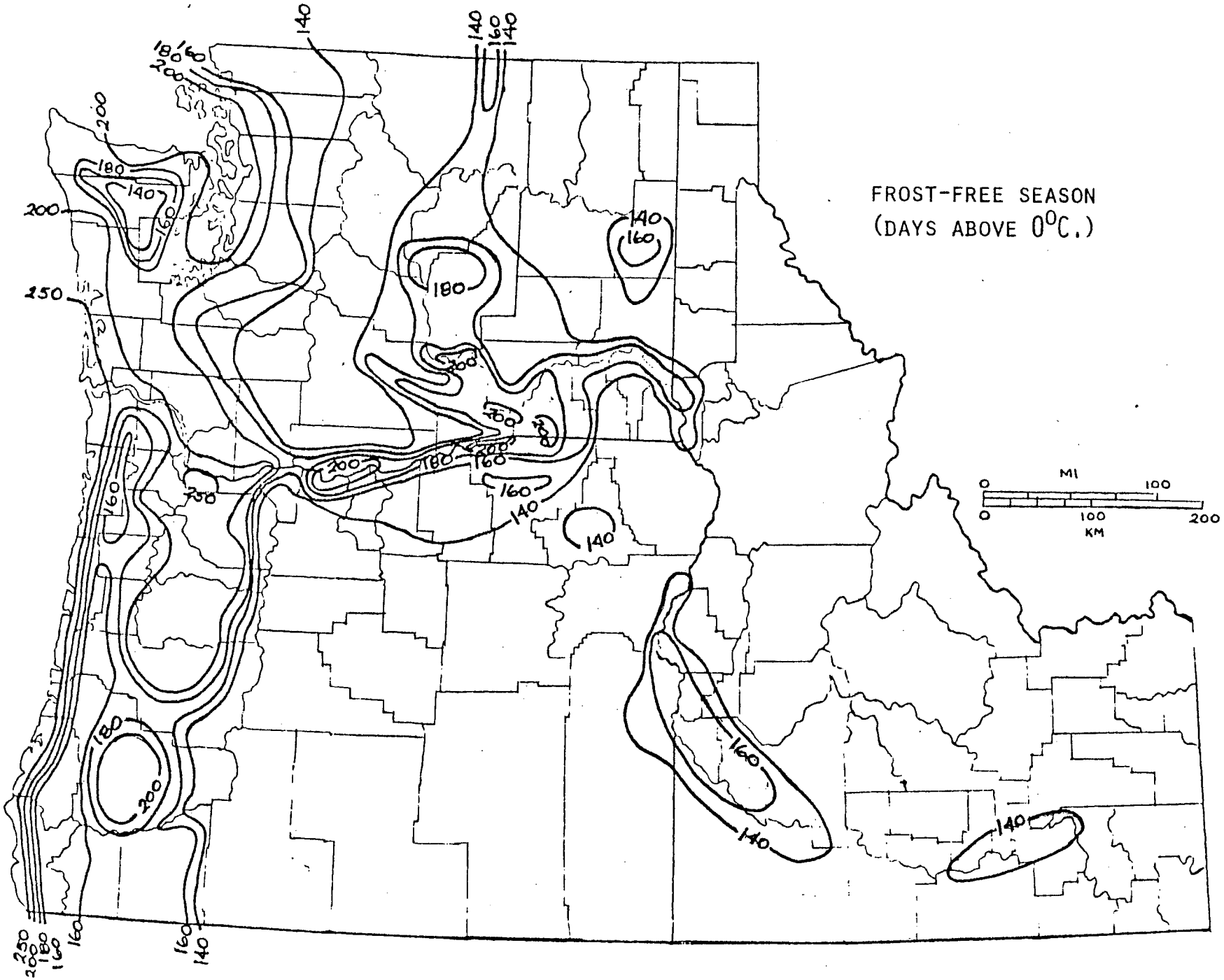

EXPECTED 20-YEAR MINIMUM
TEMPERATURES (°C.)
-18°C = 0°F
-22°C = - 8°F
-26°C = -15°F
-30°C = -22°F
-32°C = -26°F
MI
KM
0
100
200
-32
-30
-26
-22
-18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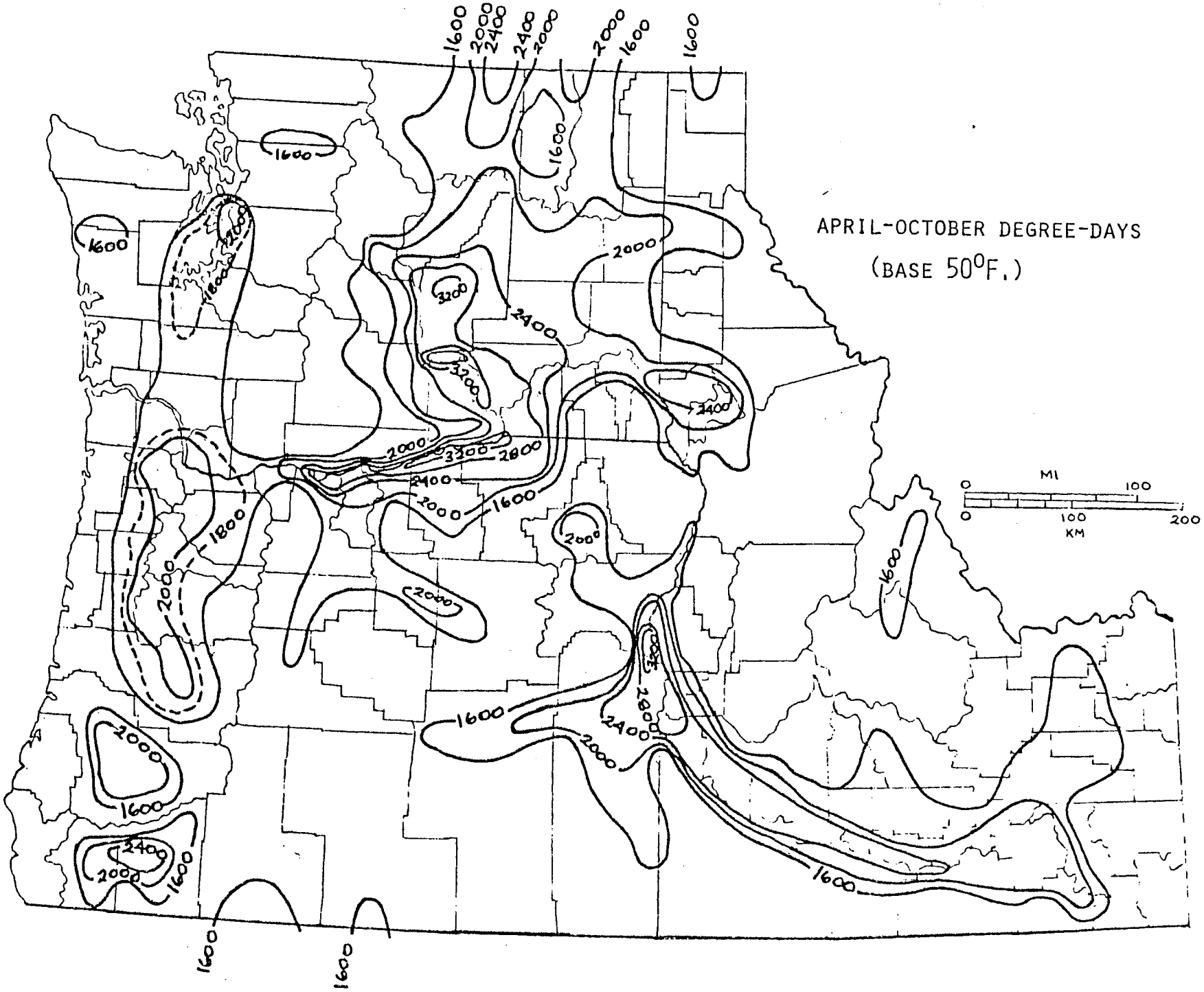
(DAYS ABOVE 0°C.)
MI
0
100
0
100
200
KM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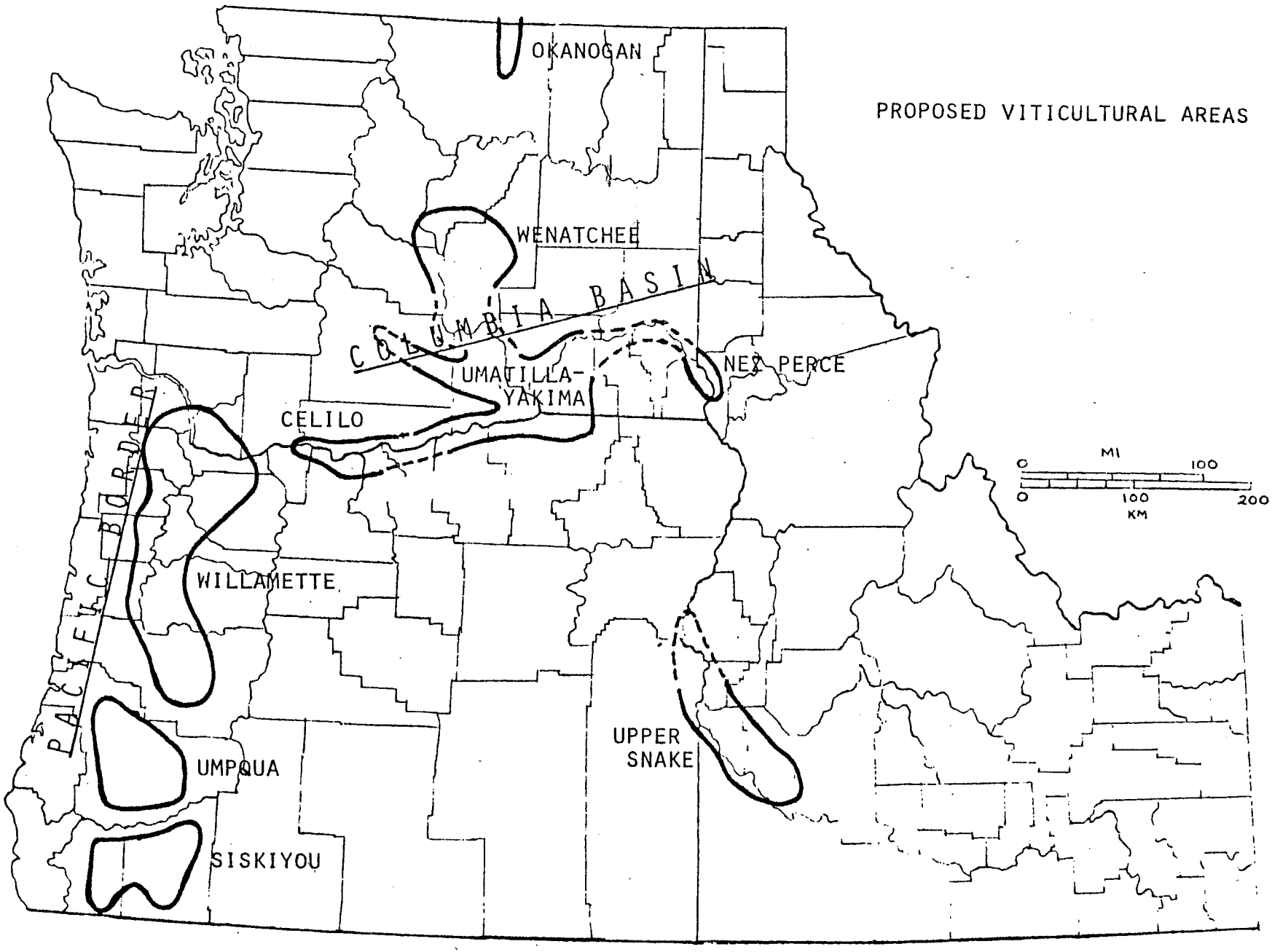
(BASE 50°F.)
MI
0
100
0
100
200
KM


PROPOSED VITICULTURAL AREAS
OKANOGAN
WENATCHEE
COLUMBIA BASIN
UMATILLA-
YAKIMA
NEZ PERCE
CELILO
PACIFIC BORDER
WILLAMETTE
UMPQUA
SISKIYOU
UPPER
SNAKE
0 MI 100
0 100 200
KM

Angy 15 Feb 8

Region	Area	Station	Elevation	Expected 20-yr. Minimum Temp.	Frost-Free Season (0°C)	Degree-Days Apr-Oct (50°F)
PACIFIC BORDER	WILLAMETTE	Albany, Ore.	65m	-18.3°C	227 days	2193
		Cherry Grove, Ore.	274	-18.3	209	1765
		Cottage Grove, Ore.	198	-20.0	161	1866
		Dallas, Ore.	99	-19.4	165	1852
		Estacada, Ore.	126	-17.8	184	1968
		Eugene, Ore.	137	-18.3	204	1991
		Falls City, Ore.	198	-17.8	186	1768
		Forest Grove, Ore.	53	-18.3	175	2102
		Headworks, Ore.	228	-17.8	216	1808
		Leaburg, Ore.	206	-16.7	217	2181
		Portland CO, Ore.	30	-15.6	279	2380
		Salem, Ore.	55	-17.8	197	2050
		Vancouver, Wash.	30	-19.4	233	2352
	UMPQUA	Drain, Ore.	113	-17.8 a/	191	2260
		Riddle, Ore.	213	-19.4 a/	179	2417
		Roseburg, Ore.	146	-15.6	232	2381
	SISKI-YOU	Grants Pass, Ore.	282	-16.7 a/	162	2740
		Jacksonville, Ore.	500	-17.2 a/		2047
		Medford, Ore.	401	-18.3	178	2705
COLUMBIA BASIN	CELILO	Arlington, Ore.	107	-32.8	187	3192
		Hood River, Ore.	107	-28.9	165	2002
		The Dalles, Ore.	31	-30.0	204	3014
	UMATILLA-YAKIMA	Hermiston, Ore.	190	-35.0 a/	153	2951
		Milton-Freewater, Ore.	293	-29.4	194	3006
		Umatilla, Ore.	87	-30.6 a/	188	3265
		Hanford, Wash.	236	-32.8 (53) b/	175	3186
		Ice Harbor Dam, Wash.	112	-20.6 (8) b/	194	3170
		Kennewick, Wash.	110	-31.7	187	3118
		Kennewick 10SW, Wash.	457	-27.2 a/	183	2630
		McNary Dam, Wash.	106	-30.0 (11) b/	212	3265
		Pasco, Wash.	185		206	3199
		Paterson, Wash.	115		181	3411
		Priest Rapids Dam, Wash.	140	-23.9 (8) b/	203	3680
		Prosser, Wash.	256	-30.0 a/	157	2427
		Sunnyside, Wash.	228	-31.1	158	2662
		Wahluke, Wash.	127	-30.6 (39) b/	195	3920
		Walla Walla, Wash.	289	-27.8	174	3153
		Walla Walla AP, Wash.	357	-27.8	202	2853
		Yakima, Wash.	323	-31.1	177	2293
	WENAT-CHEE	Ephrata, Wash.	381	-29.4	186	3220
		Wenatchee, Wash.	193	-30.6	188	2718
		Wenatchee AP, Wash.	375		187	2751
	NEZ PERCE	Lewiston, Ida.	230	-23.9	179	2612
UPPER SNAKE		Huntington, Ore.	655	-26.1 a/	170	3439
		Vale, Ore.	701	-33.3	141	2623
		Boise, Ida.	827	-28.3	174	2558
		Glenns Ferry, Ida.	783	-31.7		2863
		Payette, Ida.	655	-33.3	149	2725
OKANOGAN		Oroville, Wash.	280	-28.3	173	2498

Proposed Parameters for Viticultural Areas in the Pacific Northwest

Viticultural Area		Elevation	Expected 20-year Minimum Temperature	Frost-free Season (Days between 0°C temperatures)	Degree-Days April - October (base 50°F)	Annual Precipitation
PACIFIC BORDER	WILLAMETTE	30-230 m (100-750 ft.)	-16 to -20°C (+3 to -4°F)	160 to 280 days	1800 - 2400	40-60 in.
	UMPQUA	100-300 m (325-1000 ft.)	-16 to -20°C (+3 to -4°F)	180 to 240 days	2000 - 2400	30-50 in.
	SISKIYOU	200-600 m (650-2000 ft.)	-16 to -20°C (+3 to -4°F)	160 to 180 days	2000 - 2900	20-40 in.
COLUMBIA BASIN	CELILO	30-150 m (100-500 ft.)	-29 to -33°C (-20 to -27°F)	160 to 210 days	2000 - 3200	10-30 in.
	UMATILLA - YAKIMA	50-300 m (160-1000 ft.)	-28 to -32°C (-18 to -26°F)	170 to 210 days	2400 - 3900	6-15 in.
	WENATCHEE	180-400 m (600-1300 ft.)	-29 to -32°C (-20 to -26°F)	180 to 200 days	2400 - 3200	8-10 in.
	NEZ PERCE	200-300 m (650-1000 ft)	-26 to -32°C (-15 to -26°F)	160 to 180 days	2400 - 3200	10-15 in.
UPPER SNAKE		600-900 m (2000-3000 ft)	-26 to -33°C (-15 to -27°F)	140 to 180 days	2400 - 3400	8-12 in.
OKANOGAN		250-400 m (800-1300 ft.)	-26 to -32°C (-15 to -26°F)	160 to 180 days	2400 - 2800	10-15 in.

Note: Values used to define area limits are underlined.

Sokol Blosser Winery SB
P.O. Box 199, Blanchard Lane
Dundee, Oregon 97115
(503) 864-3342 or 864-2307

28 April 1983

Mr Charles N Bacon
Regulations and Procedures Division
Bureau of ATF
1200 Penna Ave, NW, Room 6226
Washington, DC 10226

Dear Mr Bacon:

Attached is a revised proposal for the Oregon portion of the Columbia Valley Viticultural Area.

About half the area in the original proposal has been eliminated. The current and planned grape plantings are shown. If you think the area is still too large, it would be possible to narrow in slightly, mainly in the area between US97 and the Morrow Co line. The other areas are so similar that it would be difficult to draw a tigher line that would be reasonable.

As you will note, the line I have drawn closely follows the line prepared by Aney.

Please let me know if I can be of further assistance.

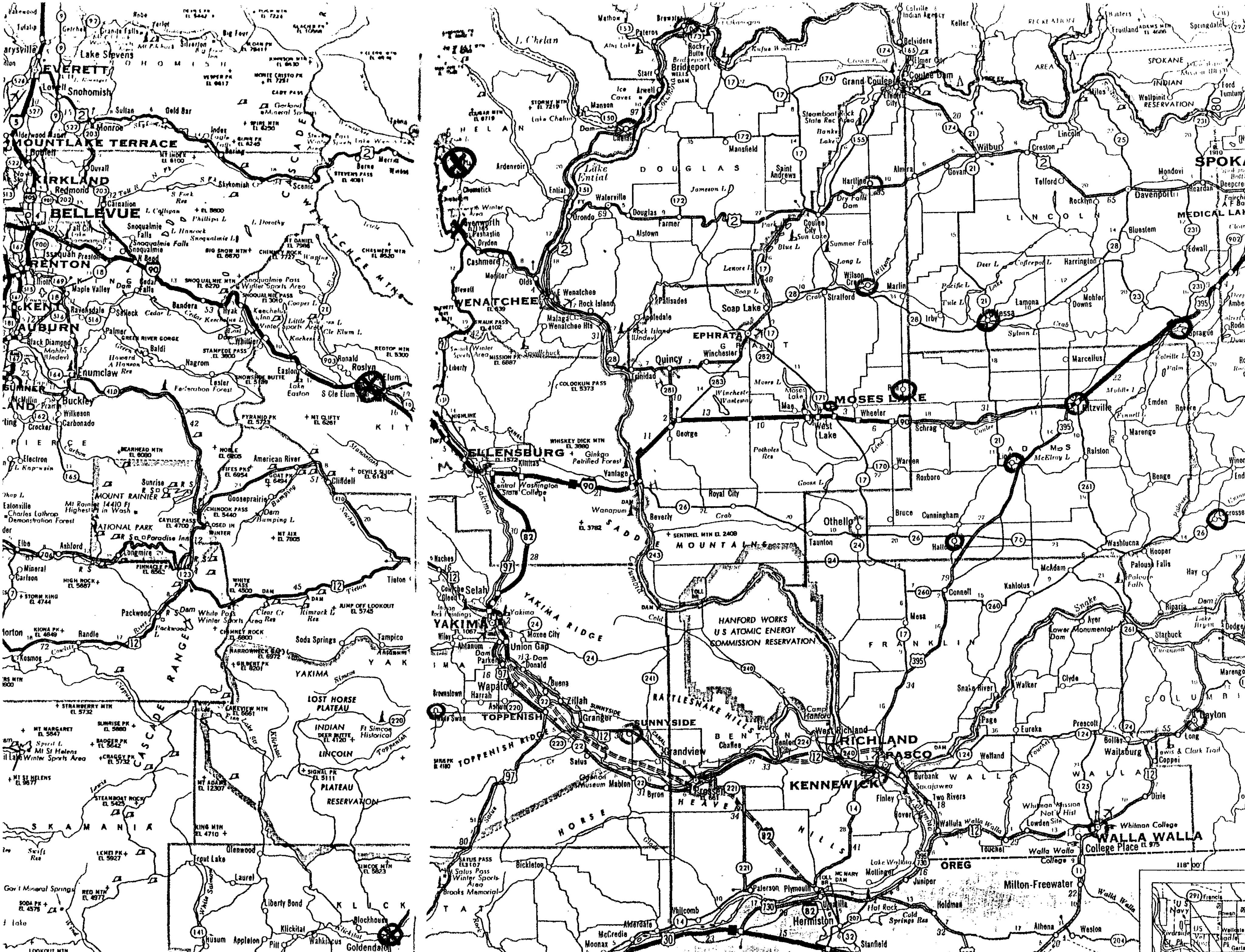
Sincerely,

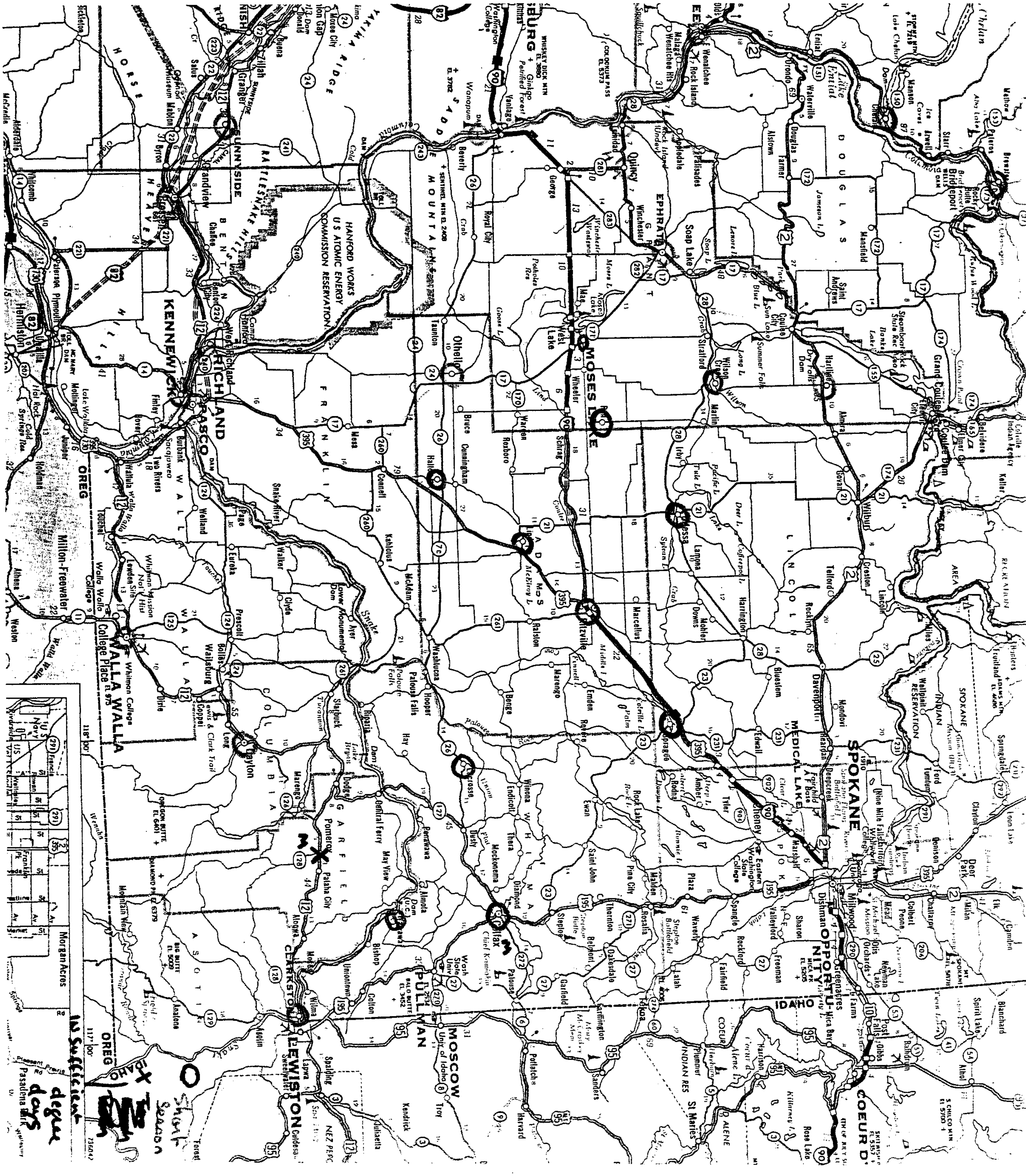
William R. Blosser

REVISED NARRATIVE DESCRIPTION

Oregon portion of of Porposed Columbia Valley Appelation

From Rowena (which is across the Columbia River from the mouth of the Klickitat River in Washington); south to the intersect of Township Line (TSL) 12 and 13 on the Willamette Base Line; then east on the Willamette Base Line to US Highway 97; then north on US 97 to the town of Wasco; then east on the Wasco-Klondike road to the town of Rock Creek; then north along the Union Pacific Rail line to the TSL; then east on the TSL, crossing Hwy 74 into Morrow County to the intersection of the 1000 foot contour with Township 24 (northwest of Ella Butte); then following the 1000 foot contour east to Nolin on the Union Pacific Rail Line; then east along the rail line to Pendleton, Mission, Cayuse and Thornhollow; then northeast in a straight line to Weston; then northeast to the intersection of the 2000 foot contour with the boundary of Oregon and Washington.


EVERETT
Snohomish
Lake Stevens
MOUNTLAKE TERRACE
KIRKLAND
Redmond
BELLEVUE
RENTON
KENT
AUBURN
Enumclaw
Buckley
Wilkeson
Carbonado
Issaquah
Snoqualmie
North Bend
Monroe
Sultan
Gold Bar
Index
Skykomish
Scenic
CASCADE RANGE
MOUNT RAINIER
NATIONAL PARK
Packwood
Randle
Morton
Ashford
Elbe
Mineral
Cle Elum
Roslyn
Easton
American River
Cliffdell
Tieton
Soda Springs
Tampico
YAKIMA
LOST HORSE PLATEAU
INDIAN RESERVATION
Glenwood
Trout Lake
Laurel
Liberty Bond
Klickitat
Goldendale
Husum
SKAMANIA
Leavenworth
Cashmere
WENATCHEE
Chelan
Manson
Entiat
Waterville
Orondo
Douglas
Farmer
Mansfield
DOUGLAS
Bridgeport
Brewster
Pateros
Grand Coulee
Coulee Dam
Coulee City
Hartline
Almira
Wilbur
Creston
Lincoln
Davenport
SPOKANE
MEDICAL LAKE
LINCOLN
Harrington
Odessa
Sprague
Ritzville
MOSES LAKE
EPHRATA
Soap Lake
Quincy
George
Wheeler
Warden
Othello
Royal City
Beverly
ELLENSBURG
Kittitas
Vantage
Ginkgo Petrified Forest
YAKIMA
Selah
Union Gap
Wapato
TOPPENISH
TOPPENISH RIDGE
Zillah
Granger
SUNNYSIDE
Grandview
Prosser
YAKIMA RIDGE
RATTLESNAKE HILLS
HANFORD WORKS
U S ATOMIC ENERGY
COMMISSION RESERVATION
RICHLAND
PASCO
KENNEWICK
FRANKLIN
Connell
Mesa
Washtucna
Palouse Falls
Starbuck
Dayton
Waitsburg
WALLA WALLA
College Place
Whitman College
Milton-Freewater
OREG
Hermiston
Umatilla
HORSE HEAVEN HILLS
Bickleton
Dixie
Prescott
Eureka
Wallula


SPOKANE
MOSES LAKE
KENNEWICK
RICHLAND
PASCO
WALLA WALLA
LEWISTON
CLARKSTON
PULLMAN
MOSCOW
EPHRATA
MEDICAL LAKE
HANFORD WORKS
US ATOMIC ENERGY
COMMISSION RESERVATION
IDAHO
OREG

WALTER CLORE, Consultant
1317 PATERSON ROAD, PROSSER, WASHINGTON 99350

C. P. D.

July 22, 1982

Mr. Stephen E. Higgens, Director
Bureau of Alcohol, Tobacco and Firearms
Washington D.C. 10116

Dear Mr. Higgins:

Enclosed is a submitted proposal, maps, accompanying data and references concerning the application for an American Viticulture Area under the provisions of the Treasury decision ATF - 60 and 27 CFR part 9. The proposed viticultural area which involves similar soils and climatic conditions in the State of Washington is to be known as the "COLUMBIA VALLEY".

As the proposed "Columbia Valley" appellation involves a rather large area, wide interest of vineyard and winery personnel in Washington will be involved. A convenient central location for a hearing would be the Red Lion Motel in Pasco, Washington. This motel is adjacent to the main highway US 395 and is less than a mile from the Pasco Airport served by Republic, Western and Horizon Airlines.

When arrangements need to be made for scheduling a hearing, please contact me and/or Mr. Wallace Opdycke, President, Chateau Ste. Michelle, One Stimson Lane, P.O. Box 1976, Woodinville, 98702, Mr. Bill Preston, President, Preston Wine Cellars, Star Route 1, Box 1234, Pasco, 99301, Mr. Mike Wallace, President, Hinzerling Vineyards, 1520 Sheridan Avenue, Prosser, 99350, Mr. Jerry Warren, President, Enological Society of the Pacific Northwest, c/o Department of Rehabilitation Medicine, RJ - 30, University of Washington, Seattle, 98195, Mr. Keith Ellis, Director, Department of Agriculture, State of Washington, Olympia, 98504.

Sincerely,

Walter J. Clore

Walter J. Clore, PhD
Viticulture Consultant

AMERICAN APPELLATION VITICULTURE AREA FOR EASTERN AND SOUTH CENTRAL WASHINGTON

TO BE KNOWN AS —

"COLUMBIA VALLEY"

The appellation conditions of the "Columbia Valley" viticulture area are defined as follows:

150 frost free (32°F) or more growing days;

2,000 or more heat units (daily degrees above a mean of 50°F for April-October) (see Climatic Data and references 7,13,14,20,27,31,41,45);

Elevation not to exceed 2,000 feet;

Area rainfall not to exceed an annual average of 15 inches. (see Exhibit 1 - Map of Annual Precipitation & Climatic Data);

Two or more feet of such soil types as silt loam, fine sandy loam, sandy loam and loamy sands (ref. 25,35,36,37,38,43).

The viticulture area in Washington covers parts or all of the following counties: Klickitat, Yakima, Kittitas, Chelan, Okanogan, Douglas, Ferry, Stevens, Spokane, Lincoln, Grant, Adams, Whitman, Asotin, Garfield, Columbia, Walla Walla, Franklin and Benton. A narrative description of the viticulture boundaries and marked Geological Survey map (scale 1:500,000) is enclosed (Exhibit 2).

This area is distinguished by its broadly undulating or rolling surface, cut by rivers and broken by long sloping basaltic uplifts extending generally in an east-west direction, and a natural lack of native forests (ref. 5,15,18,23,24,25).

The Cascade Range borders the west side of the "Columbia Valley" keeping this area open and barren by intercepting most of the Pacific air moisture (ref. 5,25). On the north, this area is enclosed by the Okanogan Highlands, on the east, by the Greater Spokane Area, and the eastern portion of the high rolling Palouse Prairie. The south side is bordered by the Blue Mountains, Oregon and the Colubmia River. The area surrounding the "Columbia Valley" viticulture area is forested, except for the immediate southside. For these bordering areas, elevations generally exceed 2,000 feet, rainfall exceeds 15 inches annually, the growing season is less than 150 frost free days and heat units fall below 2,000 degrees (see precipitation map anc climatic data).

Within the "Columbia Valley" viticulture area there is a range of elevations from 400 feet to over 3600 feet, rainfall varies from an average of 6.3 to slightly over 26 inches, growing degree days range from less than 1400 to over 3300 and the frost free days can be 140 or less. However, within this viticulture area along the Columbia, Snake and Yakima River Valleys extensive lands with comparable climatic conditions can be found which meet the defined requirements of this viticulture area (ref. 5,17,26,32,34, 39,43,45,46). This is the basis for defining such a large area which extends two degree Latitude (46° to 48°) and nearly over 4° Longitudes (117° to 121°) and proposing to name it "Columbia Valley." (See U.S. Geological Survey Map 1:500,000)

Historical evidence and geographical features: The Lewis and Clark Pacific Expedition in 1804-06 first mapped a broad area involving Washington, Idaho and Oregon as "Columbia Valley" (see Exhibit 3 - Map of Lewis & Clark Track). The term "Columbia Valley" has been used in other publications, such as, Geology of the Grand Coulee (ref. 24), and Grand Coulee and Neighboring Geological Wonders (ref. 15).

"Columbia" is now being used as a brand name by Columbia Wine Cellars, Redmond, Washington. Other have used this name in the past.

The grape is not indigenous to this area, but vines of both vinifera and labrusca type grapes can be found growing throughout the proposed viticulture area (ref. 1,8,6,30,40). The oldest planted vinifera vines still in existence were planted by German emigrants in the Tampico vicinity, west of Union Gap, in 1871. Others were planted in the Kennewick area in 1895 (ref. 9). Unattended vines can still be found near Chelan and Manson, Keller Ferry, the mouth of the Spokane River, Maryhill and the Maryhill museum, Plymouth and the Lewiston-Clarkston area.

Plantings of premium vinifera wine grapes began in the early sixties. Currently there are over 8,000 acres of vinifera grapes grown in Washington including the following major varieties: Merlot, Cabernet Sauvignon, Chardonnay, Chenin Blanc, Sauvignon Blanc, Gewurztraminer, Grenache, White Riesling, Muscat, Semillon and Pinot Noir. All of these acres are included within the boundaries of the Columbia Valley.

Wines were made in Washington prior to Prohibition, but commerical winemaking did not start until the repeal of Prohibition (ref. 1,2,8,12,16,22,29,34,47,48,49). At one time there were as many as 42 bonded wineries in operation making grape, fruit and berry wines (ref. 1,12,34). At present there are 28 bonded wineries (Wash. State Liquor Board) devoted mainly to making premium vinifera grape wines (ref. 3,10,11,22,39,44,47,49).

The early explorers and pioneers have referred to this treeless, undulating semi-arid area as Columbia Valley, Columbia Plain, Great Columbia Plain, Columbia Plateau, Columbia Basin and Inland Empire. This area is described by Freeman & Martin (ref. 15), "as a rather flat, somewhat tilted, deformed triangle measuring 250 air miles along each side, with its apex at the mouth of the Okanogan River in north central Washington, its southern corners in the Deschutes County of eastern Oregon and the Camas Prairie of northern Idaho."

Map 1 in Meinigs book (ref. 25) outlines rather well the "Great Columbia Plain and Some Physical Subregions" as does "Pictorial Landform Map of the State of Washington and Adjacent Parts of Oregon, Idaho and British Columbia" and satellite pictures of this area in color (see Exhibit 4). Notably the periphery of the proposed "Columbia Valley" viticulture appellation closely approximates the circumscribed area marked by 15" or less rainfall (see "Mean Annual Precipitation" map).

EXHIBIT 1

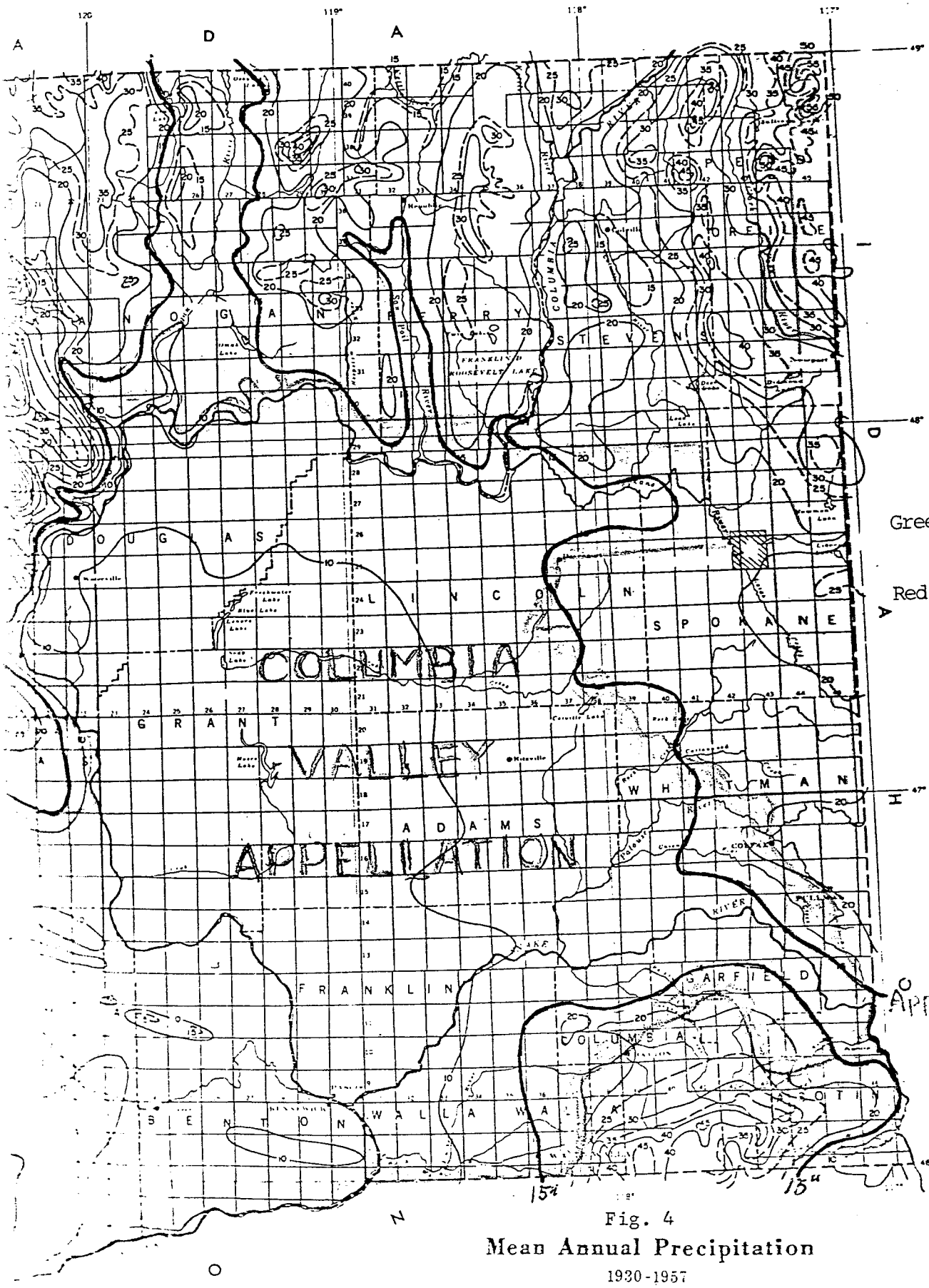
WASHINGTON CLIMATIC DATA

FOR THE "COLUMBIA VALLEY" APPELLATION

Station	Elevation (ft.)	Latitude	Frost Free Season Days	Annual Precipitation (inches)	Apr-Oct Degree Days	Lowest Occurring Min. Temp. F°
Klickitat, County						
Dallesport	222	45° 37'		13.70	2,817	-25
John Day Dam	186	45° 43'		10.59	3,216	- 2
Goldendale	1,800	45° 49'	128	17.41	1820	-29
Yakima, Co.						
Naches	1,874	46° 39'		8.38	2,391	-15
Yakima	1,064	46° 34'	184	7.86	2,274	-25
Moxee	1,000	46° 35'		7.36	1,992	-23
Wapato	850	46° 26'		7.11	3,124	-27
White Swan	970	46° 23'	137	8.22	2,390	-37
Fort Simcoe	1,300	46° 20'		12.41	2,791	-20
Toppenish	765	46° 22'		5.88	2,267	-32
Sunnyside	747	46° 19'	160	6.90	2,666	-30
Kittitas, Co.						
Ellensburg	1,729	47° 02'	148	8.75	2,127	-31
Cle Elum	1,930	47° 11'	132	22.10	1,678	-33
Grant Co.						
Priest Rapids Dam	460	46° 39'		6.80	3,796	-11
Wahluke	416	46° 39'		6.36	3,920	-23
Smyrna	560	46° 50'		8.39	2,391	-28
Moses Lake	1,208	47° 07'	143	8.10	2,338	-33
Quincy	1,274	47° 13'	160	8.19	2,397	-29
Trinidad	555	47° 13'	189	8.24	3,432	-17
Ephrata	1,259	47° 18'	186	8.42	3,204	-33
Wilson Creek	1,276	47° 25'	130	9.17	2,268	-30
Hartline	1,910	47° 41'	156	10.91	2,360	-19
Grand Coulee Dam	1,700	47° 57'	194	10.66	2,512	
Ruff	1,342	47° 10'	127	9.62	2,391	-31
Chelan Co.						
Wenatchee	1,229	47° 25'	177	9.99	2,818	-21
Dryden	920	47° 32'		16.78		
Leavenworth	1,128	47° 34'	136	23.91	2,145	-26
Plain	1,940	47° 47'	87	25.65	1,381	-31
Chelan	1,120	47° 50'	201	11.23	2,667	-15
Manson						
Okanogan, Co.						
Methow	1,165	48° 08'		12.44	2,360	-37
Brewster	878	48° 06'	175	10.48	2,758	-23
Pateros	825	48° 03'		13.13	3,062	-16
Okanogan	900	48° 22'	168	11.65	2,972	-23
Omak 2NW	850	48° 25'	141	12.44	2,238	-23
Oroville 3NW	1,060	48° 56'	163	11.43	2,543	-19
Nespelem	1,890	48° 08'	128	13.57	2,024	-33
Ferry, Co.						
Inchelium	1,685	48° 19'		17.59	1,839	-26
Laurier	1,644	49° 00'	123	19.26	2,055	-32

Station	Elevation (ft.)	Latitude	Frost Free Season Days	Annual Precipitation (inches)	Apr-Oct Degree Days	Lowest Occurring Min. Temp. F°
Stevens County						
Boulder Road	1,450	48° 50'				
Kettle Falls	1,265	48° 34'		16.12	2,054	-32
Colville	1,635	48° 33'	124	17.67	1,901	-29
Cedonia	2,000	48° 08'		19.43	1,260	-24
Lincoln Co.						
Odessa	1,540	47° 20'	129	10.81		
Sprague	1,925	47° 18'	129	14.70		
Adams, Co.						
Hatton	1,428	46° 46'	135	9.94	2,510	-30
Lind Exp. Station	1,625	47° 00'	143	10.11	2,525	-26
Othello	1,110	46° 50'	151	8.16	2,666	-26
Ritzville	1,825	47° 07'	137	11.67	2,440	
Whitman, Co.						
Colfax 1NW	1,955	46° 53'	121	20.97	2,005	-26
Ewan	1,720	47° 07'		16.32		
La Crosse ESE	1,546	46° 48'	115	14.05	2,365	-30
Asotin, Co.						
Alpowa Ranch	730	46° 25'		10.82	3,156	-17
Clarkston Hts.	1,185	46° 23'	157	13.15	2,605	-18
Garfield, Co.						
Pomeroy	1,810	46° 28'	141	16.58	2,287	-22
Wawawai 2NW	695	46° 39'		18.74	3,310	-10
Columbia, Co.						
Dayton	1,620	46° 19'	163	19.53	2,425	-22
Dayton 5NW	1,710	46° 22'		17.32		
Huntsville	1,400	46° 18'		17.57		
Walla Walla, Co.						
Attalia	360	46° 06'		6.87		
Mill Creek	2,000	46° 01'		39.56		
Mill Creek Dam	1,275	46° 04'		17.61		
Pleasant View	1,650	46° 31'		12.39		
Touchet	443	46° 02'		9.83		-23
Walla Walla FAA	1,185	46° 06'		18.43	2,881	-25
Walla Walla 3W	800	46° 03'	171	15.33	3,031	-25
Walla Walla WBO	949	46° 02'		15.50	3,217	-16
Frankline Co.						
Kahlotus	1,340	46° 36'		10.37		
Mesa	875	46° 36'		7.72		
Pasco	360	46° 13'		7.40		
Connell 4NNW	1,125	46° 14'				
Connell 12SE	1,078	46° 30'		9.44		
Eltopia 7WNW	895	46° 29'		8.47		
Benton Co.						
Hanford	385	46° 35'		6.39	3,308	-23
Kennewick	392	46° 13'	184	7.49	3,181	-23
Kennewick 10SW	1,500	46° 08'		9.93	2,636	-17
McNary Dam	348	45° 57'		7.64	3,247	-22
Mottinger	307	45° 56'		8.34	3,461	-14
Prosser	675	46° 12'		8.53	2,848	-22
Prosser 4NE	840	46° 15'	155	7.77	2,548	-20
Richland 25NNW	733	46° 34'		6.73	3,230	-27

EXHIBIT 1



Green = Appellation Boundary

Red = Precipitation Boundary

Fig. 4

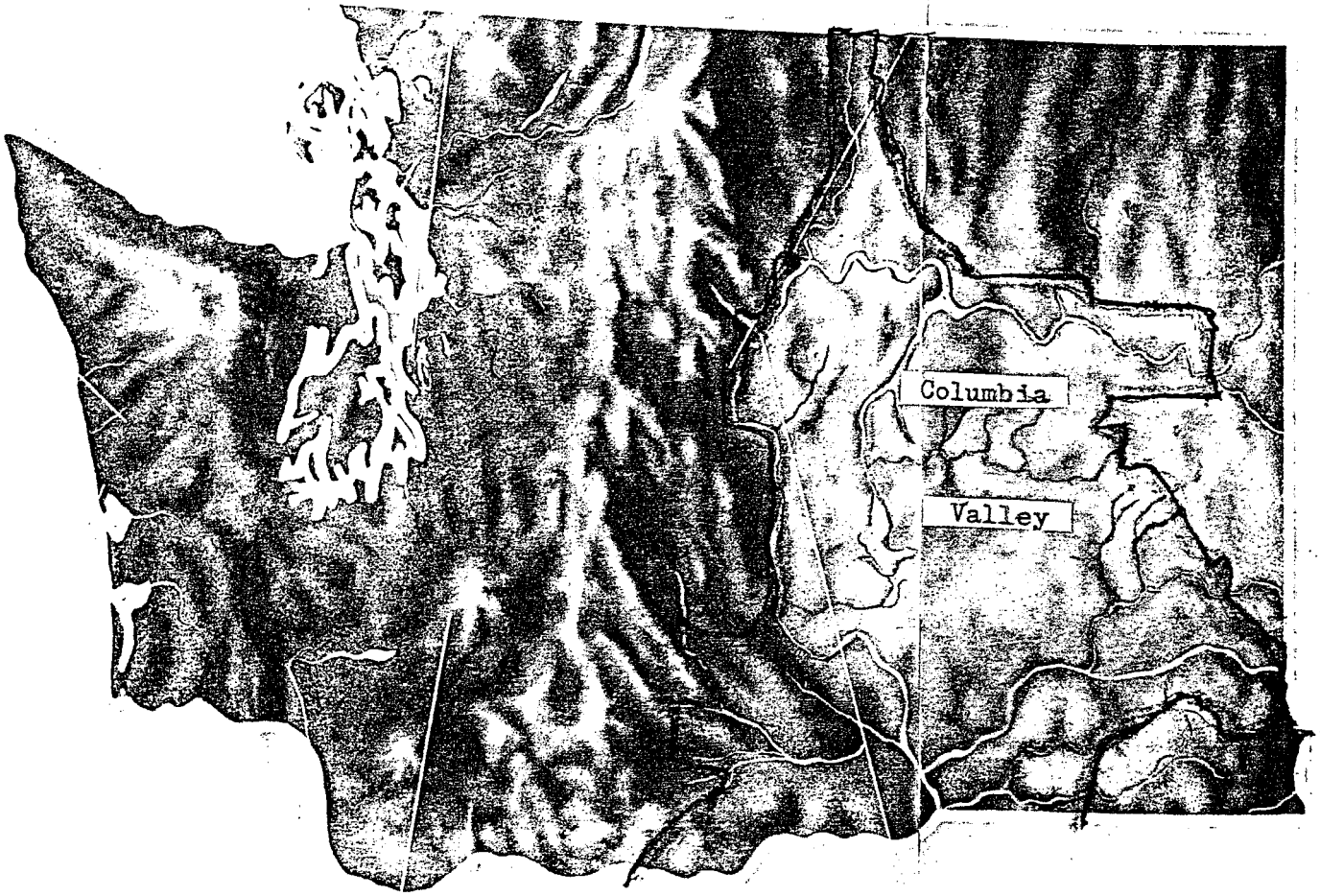
Mean Annual Precipitation

1930-1957

STATE OF WASHINGTON

REPRODUCED FROM THE ARCHIVES OF
THE OREGON HISTORICAL SOCIETY

EXHIBIT 4



SATELLITE VIEW OF THE "COLUMBIA VALLEY" APPELLATION

Sokol Blosser Winery SB
P.O. Box 199, Blanchard Lane
Dundee, Oregon 97115
(503) 864-3342 or 864-2307

14 September 1982

Mr Charles N. Bacon
Regulations and Procedures Division
Bureau of ATF
1200 Pennsylvania Ave, NW Room 6226
Washington, D.C. 20226

Dear Mr Bacon:

Thank you very much for sending me a copy of the proposal for the Columbia Valley viticultural area. After reviewing the proposal, I have been asked by the Oregon Wine-growers Association, which represents 37 wineries and approximately 125 grape growers in Oregon, to respond to the proposal.

Our position is that with the addition of part of Oregon within the viticultural area, it will be a good and reasonable one.

We have prepared a description of the area we would suggest adding to the viticultural area. It follows the same criteria as in the original proposal and the end points of the boundary join to the points where the other proposal intersect the Columbia River. The rationalle for the boundary, the historical information and the viticultural information are the same as in the other proposal. Grapes are currently grown within the Oregon portion of the viticultural area, and many more acres are planned. A newspaper article on one such planting is attached.

If you wish further information on this, please call on me.

Sincerely,

William R Blosser

cc: Wallace Updycke, Bill Preston, Mike Wallace, Gerry Warren, Alec Bayless, Bill Fuller, Ed Glenn

STATE OF OREGON PORTION OF THE "COLUMBIA VALLEY" VITICULTURE APPELLATION

Continue on the 2,000' elevation topography line east of Walla Walla, Washington into Oregon east of Spoffora south to Bingham Springs (BS); southeast along Umatilla National Forest to Willamette Meridian, then west to Meacham on to Highway 74 and south to Pilot Rock, Nye, Vinson, Lean, Heppner and Ruggs; from Ruggs west on Highway 206 to Eightmile, Condon and Township Line (TSL) nearest Sherman and Gilliam Counties; west on TSL to Erskine; north from Erskine on DesChutes River to Willamette Base Line (WBL); west along WBL to TSL intersect 12 & 13; and from intersect 12 & 13 north to Rowena (which is across from the mouth of the Klickitat River in Washington).

valuable nutrients are lost.

Capital Press July 30, 1982

Morrow growers eye first wine grape crop

By VIRGIL RUPP
For the Capital Press

BOARDMAN, Ore. — Four Boardman residents are looking ahead to October and the harvest of the first commercial wine grapes in Morrow County.

The grapes are being grown under irrigation on 12 acres by Ed and Frances Glenn, Dewey West and Vern Russell.

Eventually the grape growers expect to have vines on 35 acres, producing enough grapes for 20,000 gallons of wine a year.

The harvest this year will be limited to picking from the first vines to be planted, which went into the ground in 1979. About 1.5 tons of grapes will be picked this year, enough for a few hundred gallons of wine.

The vines include Cabernet Sauvignon, Sauvignon Blanc, Semillon, Chenin Blanc, White Riesling and Merlot.

The Boardman entrepreneurs have named their business "La Casa de Vin." A winery that can produce 4,000 gallons a year is expected to be in operation by fall.

When the Boardman winery gets its state license, it will be the first east of Hood River. Oregon's 35 other wineries are located mostly in the Willamette Valley and Southern Oregon.

But the grape-growing potential of the Columbia Basin is winning recognition. At Paterson, Wash., just a few miles from Boardman, a firm named Chateau Ste. Michelle is spending $25 million to build a winery and get grape production going. Other Oregon grape-growing projects are in the works.

Glenn, who grew up on a farm at Lostine in Wallowa County and is now a lawyer, says the Columbia Basin's soils and climate lend themselves to growing of wine grapes. The region is similar in latitude to the Bordeaux area of France, a famed wine producer.

Glenn says the warm days build heavy sugar content and cooler nights keep acid levels high, resulting in "a superior wine."

Glenn's wife, Frances, also grew up on a farm, at Umapine, west of Milton-Freewater. She's the chief vine trainer of the new outfit.

Oregon Climatic Data
For the "Columbia Valley" Appellation

Station	Elevation (ft.)	Latitude	First [illegible] days	Annual precipitation (inches)	Apr-Oct Degree Days	Lowest occurring Min. Temp F° C°
Oregon						
Wasco County						
The Dalles	102	45° 36'	204	14.28	3014	-30.0
Dufur	1330	45° 27'	137	11.91	2070	
Sherman Co.						
Moro	1868	45° 29'	152	11.96	2073	-32.2
Wasco	1264	[illegible]° 35'	164	11.77	2250	
Gilliam Co.						
Arlington	315	45° 43'	187	8.92	3259	-32.8
Morrow						
Heppner	1950	45° 20'	152	13.65	2040	-30.6
Umatilla Co.						
Echo	660	45° 46'	171	10.21		
Hermston	624	45° 49'	153	9.02	2951	-33.0
Milton-Freewater	962	45° 58'	194	13.58	3006	-29.4
Pendleton	1482	45° 41'	163	12.35	2711	-33.9
Umatilla	270	45° 55'	188	8.80	3265	-31.0

Sokol Blosser Winery SB
P.O. Box 199, Blanchard Lane
Dundee, Oregon 97115
(503) 864-3342 or 864-2307

9 Sept 1982

Mr Charles Bacon
Research Section
Bureau of ATF
1200 Pennsylvania Ave NW
Washington, DC 20226

Dear Mr Bacon:

Pursuant to our phone conversation today, I thought it would be best if I wrote you immediately regarding the proposed Columbia Valley appelation. After I receive a copy of the proponent's application, I may have further things to add.

An ad hoc group of industry people has been working for a year or so on the idea of a Columbia Valley or Columbia River Valley appelation. The idea was to include in it all of the area along the river with similar viticultural characteristics. As it turns out, all study we have done on this has shown that the viticultural area must include land on both sides of the river: i.e. in Washington and Oregon. An argument can be made to include some areas of Idaho too, but this is more tenuous. Only by ignoring climate, geography, current grape plantings, soils, and history could one ever come to the conclusion that a viticultural area should stop in the middle of the river at the state boundary. Apparently, this is what the petitioner has tried to do. Such a boundary makes sense from a very narrow self-interest point of view, but is nonsense from a viticultural point of view.

I am attaching one study that was done as a basis for defining the viticultural boundaries. A similar study was done by Dr Walter Clore in Prosser, WA. Reportedly it comes to exactly the same conclusion, but I have not seen it yet. I thought you might also be interested in the attached letter from St Michelle Winery, which was circulated to all wineries and vineyards. It, too, calls for a bi-state viticultural area.

Thank you very much for offering to send me a copy of the petition.

Sincerely,

William R. Blosser

Chateau Ste Michelle

Grandview Winery
Post Office Box 580
Grandview, Washington 98930
509/882-3928

March 5, 1982

To whom it may concern:

Ste. Michelle Vintners is pursuing a viticultural appellation for southcentral Washington. Many consumers, especially those outside the state, equate Washington to cool, wet and green, and question its suitability for premium wine production. Our intent is to create a more specific appellation that will allow greater emphasis on the actual geography and climate of the grape growing region.

Dr. Walt Clore is working with us in compiling the historical and climatological data needed for such a proposal to BATF. The critical features of this proposal are 1) a name for the appellation, 2) historical evidence to link the name to the proposed area, 3) historical evidence to tie grape growing to the area, 4) geographical, climatological and/or soil data that demonstrates the uniqueness of the area from surrounding areas, and 5) ability to define the area on U.S. Geological Survey maps.

Our preliminary research indicates that land in vicinity of the Snake and Columbia Rivers and the Yakima Valley should be included. Probable boundaries would be the Columbia Gorge (Dalles) and Cascade foothills to the west, the land in Oregon immediately adjacent to the Columbia River to the south, the Columbia River between Chelan and Grand Coulee to the north, and a line drawn from Grand Coulee to Connell approximating the 1300' topographic line to the east. There would be an arm extending from Connell east along the Snake River to the Idaho border and returning to the Oregon border along the west foothills of the Blue Mountains. This encompasses land with 150 or more frost-free days, 2000 or more Heat Units, and moderate winter temperatures.

Since BATF will request comments and possibly a hearing on this proposal, we would like to hear your comments prior to submitting it. If you have any thoughts on a name for the region, suggestions on boundaries, or historical references about grapes or wines, please send them to me. Since we plan to draw up a rough draft by April and submit the proposal by summer, we would appreciate your prompt response.

Sincerely,

Wade H. Wolfe
Viticulturist

Warren W. Aney
Rt 1, Box 1520
La Grande, OR 97850
25 February 1982

Bill Blosser
Sokol Blosser Winery
PO Box 199
Dundee, OR 97115

Methods. I've chosen to use expected 20-year minimum temperatures, frost-free days and April-October degree days as defining climatological variables. These variables were mapped (see enclosed maps).

Since federal regulations appear to require boundaries that can be found on a U.S. Geological Survey (USGS) map, I also included elevation as a variable although I haven't yet mapped this variable. Annual precipitation is also included to round out area descriptions, but it is not used as a defining variable.

My 1974 paper also used 20-year minimum temperatures and frost-free days in the same way that I am now using them. But instead of degree-days, I originally used a potential evapotranspiration index because it corrects for latitudinal differences in day length (which a degree-days type index does not do). But in this application I decided to use degree-days for a number of important reasons:

- A degree-days index is more easily understood by more persons and is more commonly used in American viticultural literature (e.g., Winkler).

- There are several ways for calculating or measuring potential evapotranspiration, each of which can produce different answers with varying accuracy and precision (I used Thornthwaite's index in my 1974 paper because it is one of the oldest and most widely used methods, but it is not the most accurate; the data you sent me is from another method and gives slightly different results than Thornthwaite's index).

- For this study, degree-days is nearly as informative as potential evapotranspiration since there are no great differences in latitude and day-length in the Pacific Northwest, i.e., we are talking about a maximum difference of 7° latitude or about 3% more daylight in the longest day of the year. But degree-days would not work well for comparing Napa Valley (38° latitude) with the Mosel (50°) where there is 11% more daylight in the longest day.

- Potential evapotranspiration indexes are difficult to calculate without a computer.

Results. These environmental variables define the Pacific Northwest's major viticultural regions and subregions as described below. The Cascades Mountain Range divides the Pacific Northwest into two major climatological influences---a moderate, moist coastal areawhere lack of summer ripening heat is the factor determining where vinifera grapes can be successfully grown; and a more severe, dry interior where frost and

winter cold are the determining factors. So vinifera grapes can be and are being grown successfully in a number of areas which I define and describe as follows (see also the enclosed map of viticultural areas):

b. Columbia Basin[a] region. Characterized by low precipitation, hot summers and cold winters. This is that part of the Columbia River drainage east of the Cascades with a frost-free season of at least 160 days.

1. Celilo subregion - along both banks of the Columbia River from Hood River on the west to Arlington[b] on the east.
   - elevation not greater than 150 m (500 ft)
   - expected 20-year minimum no lower than -33°C (-27°F)
   - growing season at least 160 days
   - at least 2000 degree-days

2. Umatilla-Yakima subregion - from Arlington[b] on the Columbia up the Columbia and Yakima valleys to Yakima[b]
   - elevation not greater than 300 m (1000 ft)
   - expected 20-year minimum no lower than -32°C (-26°F)
   - growing season at least 170 days
   - at least 2400 degree-days

3. Wenatchee subregion - Columbia River valley from Wanapum Dam[b] upriver to Wenatchee and Ephrata
   - elevation not greater than 400 m (1300 ft)
   - expected 20-year minimum no lower than -32°C (-26°F)
   - growing season at least 180 days
   - at least 2400 degree-days

4. Nez Perce subregion - Snake River valley from Lower Granite Dam[b] upriver to the Grande Ronde River[b]
   - elevation not greater than 300 m (1000 ft)
   - expected 20-year minimum temperature no lower than -32°C (-26°F)
   - growing season at least 160 days
   - at least 2400 degree-days

Discussion. As I mentioned earlier, vinifera grapes are grown successfully in all these areas but there are a lot of questions about the limits and extent of these areas that will only be answered through trial and experience. Also, there is insufficient climatological information and viticultural experience to adequately predict the suitability of the area along the Columbia River between John Day Dam and Boardman (between the Celilo and Umatilla-Yakima subregions). Lack of such information is also a problem for the Columbia River valley above the mouth of the Yakima River and the Snake River valley below Lewiston.

Some areas such as the Upper Snake are so marginal in one or more climatic factors that it is possible only carefully selected spots with optimal local climates can be reasonable expected to produce dependable viticultural reults. Finally, the very high degree-days reported for some Columbia Basin stations suggests too much summer heat may be a factor to consider in some areas right along the Columbia River (Umatilla-McNary locality with 3265 degree-days, Paterson station with 3411, Priest Rapids Dam with 3680 and Wahluke station with 3920).

The region and subregion names I have chosen are rather tentative and arbitrary at this point, but I did try to use generally accepted and currently used names, favoring Indian related names for the more specific subregions. I believe Willamette and Umpqua are commonly used names by winegrowers in those areas but Siskiyou and Celilo may not be. The latter could be Klickitat-Wasco, the names of two of the principal counties involved (as is the case with Umatilla-Yakima).

I would welcome any additional information or suggestions anyone can provide that will help us in this process. If what you see here is generally acceptable, I'll start refining it and preparing better graphics (for example, I will have to map these areas on standard USGS maps).

Sincerely,

Warren W. Aney

Footnotes:

[a] These names are land form provinces described on page 34ff, Atlas of the Pacific Northwest (Oregon State University Press, 1979)

[b] Geographical limit is not well-defined in terms of viticultural suitability.

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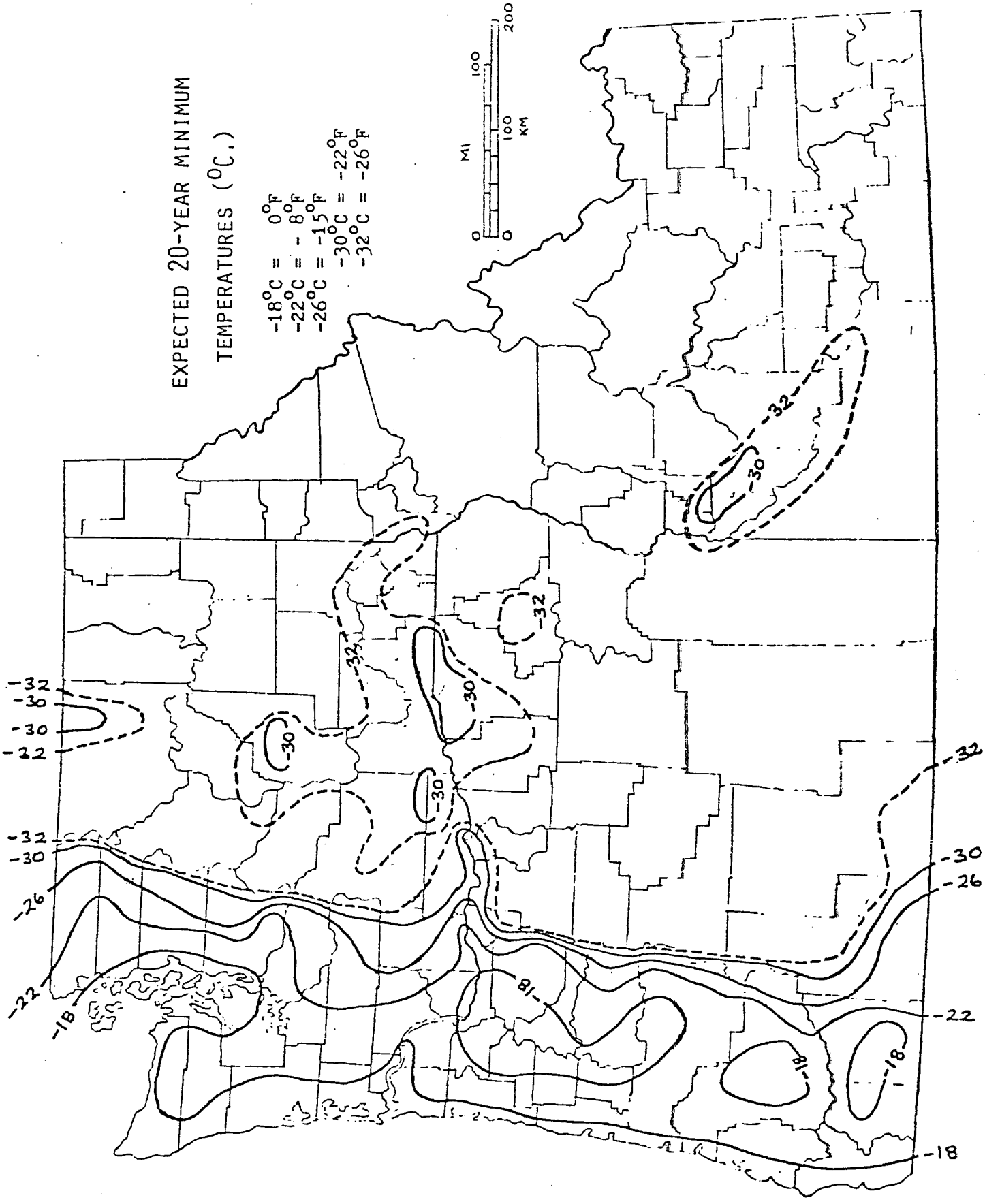
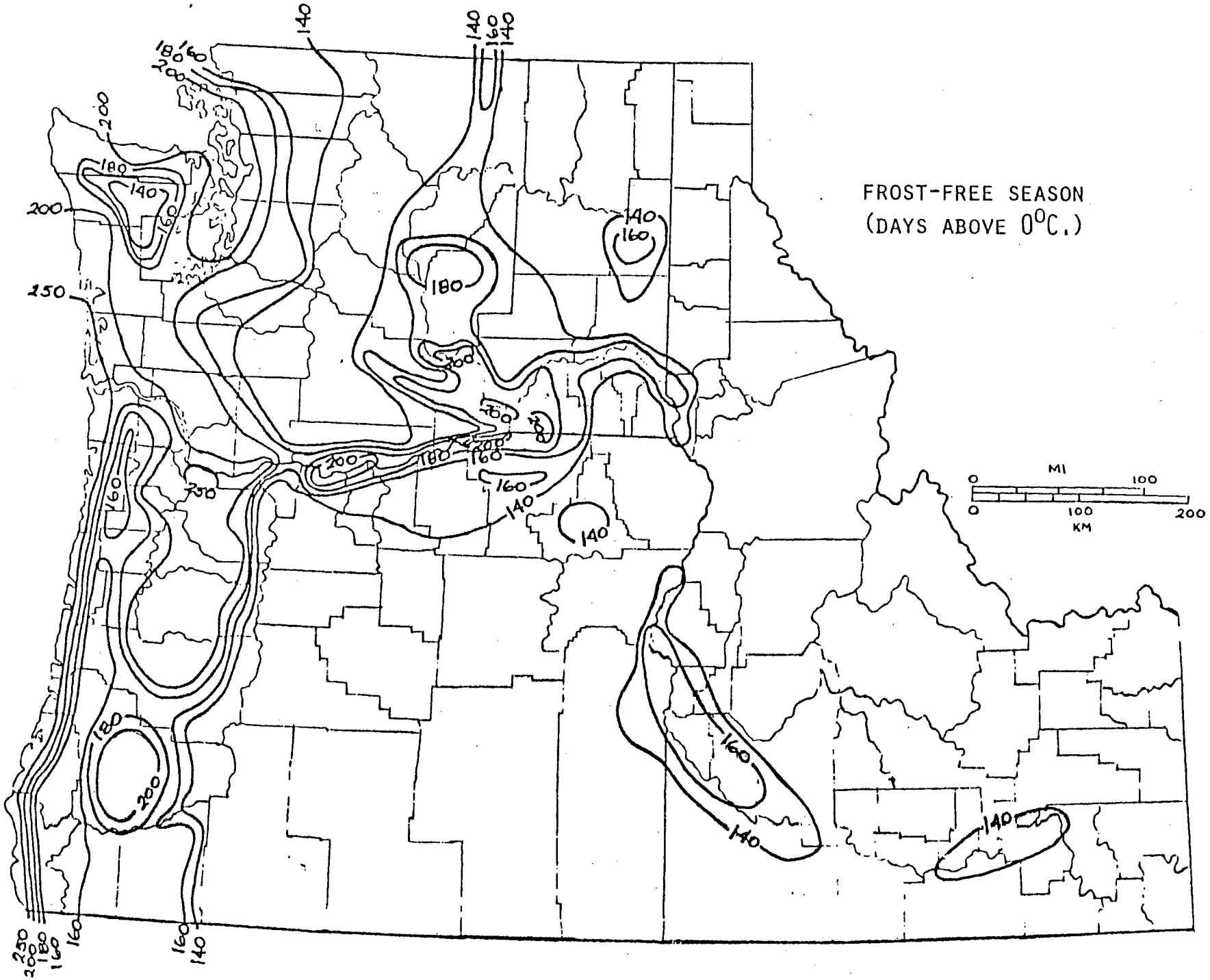
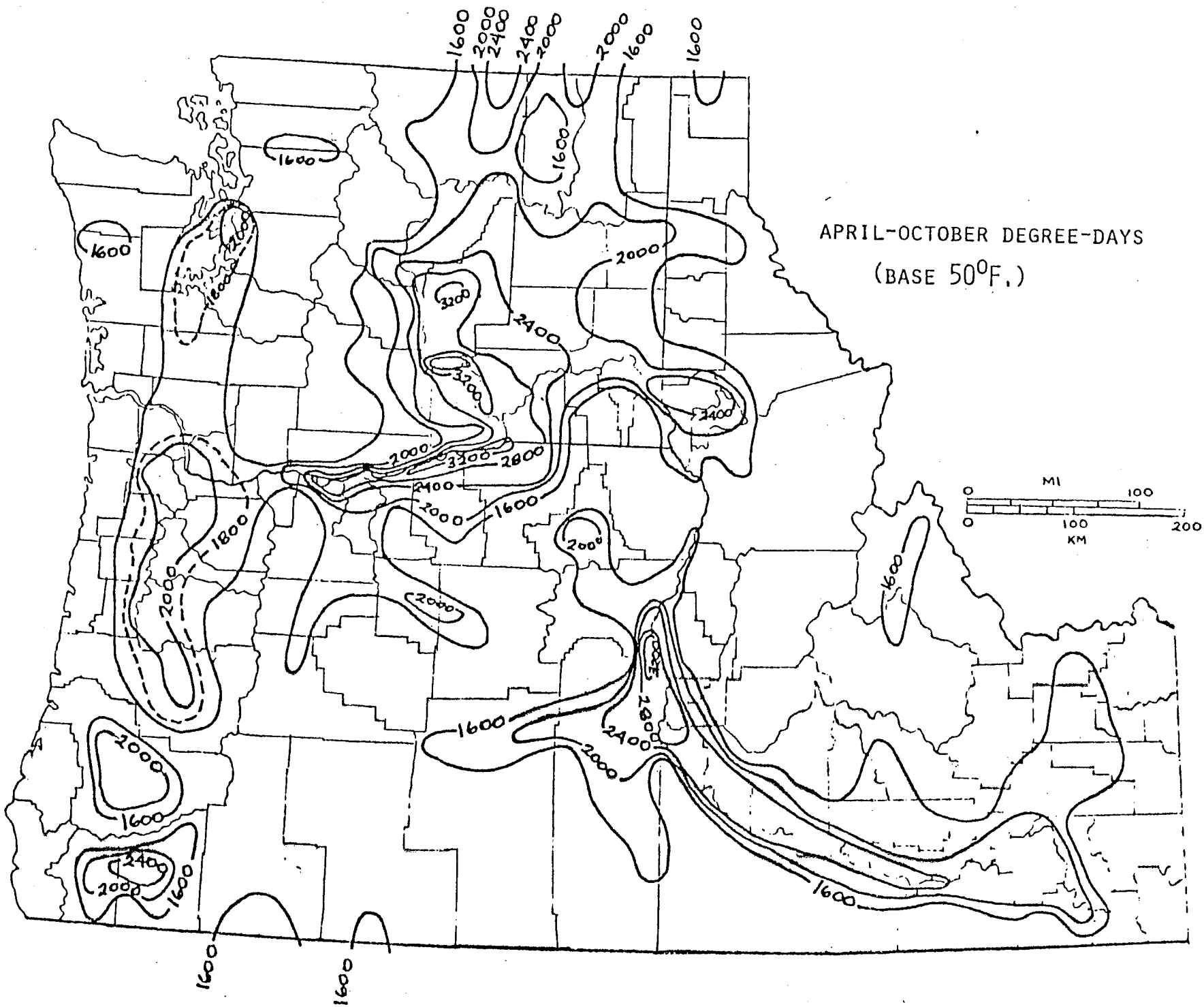
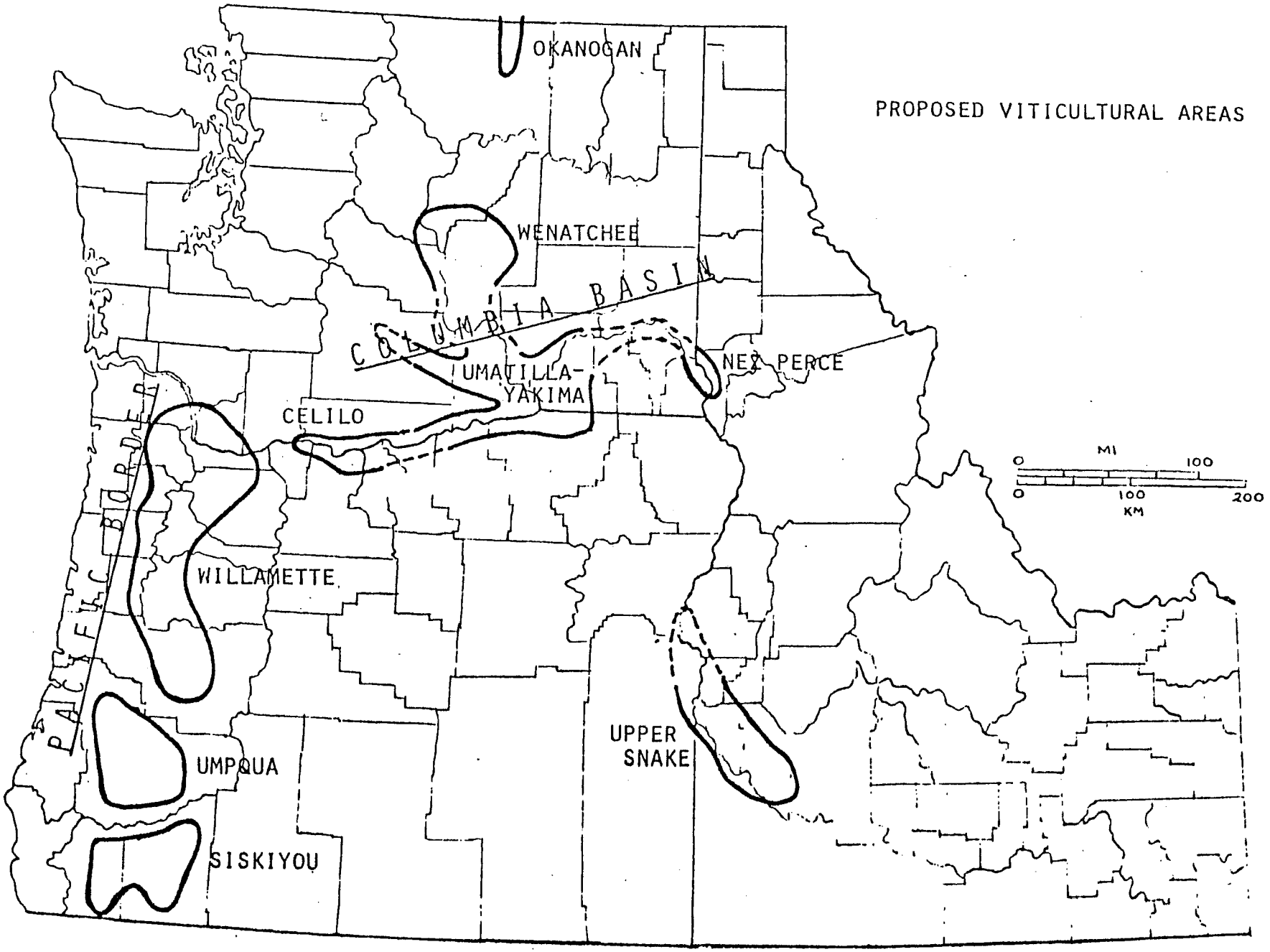

EXPECTED 20-YEAR MINIMUM
TEMPERATURES (°C.)
-18°C = 0°F
-22°C = - 8°F
-26°C = -15°F
-30°C = -22°F
-32°C = -26°F
MI
KM
0
100
200
-32
-30
-26
-22
-18


FROST-FREE SEASON
(DAYS ABOVE 0°C.)
MI
0
100
0
100
200
KM


APRIL-OCTOBER DEGREE-DAYS
(BASE 50°F.)
0 MI 100
0 100 200
KM


PROPOSED VITICULTURAL AREAS
OKANOGAN
WENATCHEE
COLUMBIA BASIN
UMATILLA-
YAKIMA
NEZ PERCE
CELILO
PACIFIC BORDER
WILLAMETTE
UMPQUA
SISKIYOU
UPPER
SNAKE
0 MI 100
0 100 200
KM

Region	Area	Station	Elevation	Expected 20-yr. Minimum Temp.	Frost-Free Season (0°C)	Degree-Days Apr-Oct (50°F)
PACIFIC BORDER	WILLAMETTE	Albany, Ore.	65m	-18.3°C	227 days	2193
		Cherry Grove, Ore.	274	-18.3	209	1765
		Cottage Grove, Ore.	198	-20.0	161	1866
		Dallas, Ore.	99	-19.4	165	1852
		Estacada, Ore.	126	-17.8	184	1968
		Eugene, Ore.	137	-18.3	204	1991
		Falls City, Ore.	198	-17.8	186	1768
		Forest Grove, Ore.	53	-18.3	175	2102
		Headworks, Ore.	228	-17.8	216	1808
		Leaburg, Ore.	206	-16.7	217	2181
		Portland CO, Ore.	30	-15.6	279	2380
		Salem, Ore.	55	-17.8	197	2050
		Vancouver, Wash.	30	-19.4	233	2352
	UMPQUA	Drain, Ore.	113	-17.8 [a]	191	2260
		Riddle, Ore.	213	-19.4 [a]	179	2417
		Roseburg, Ore.	146	-15.6	232	2381
	SISKI-YOU	Grants Pass, Ore.	282	-16.7 [a]	162	2740
		Jacksonville, Ore.	500	-17.2 [a]		2047
		Medford, Ore.	401	-18.3	178	2705
COLUMBIA BASIN	CELILO	Arlington, Ore.	107	-32.8	187	3192
		Hood River, Ore.	107	-28.9	165	2002
		The Dalles, Ore.	31	-30.0	204	3014
	UMATILLA-YAKIMA	Hermiston, Ore.	190	-35.0 [a]	153	2957
		Milton-Freewater, Ore.	293	-29.4	194	3006
		Umatilla, Ore.	87	-30.6 [a]	188	3265
		Hanford, Wash.	236	-32.8 (53) [b]	175	3186
		Ice Harbor Dam, Wash.	112	-20.6 (8) [b]	194	3170
		Kennewick, Wash.	110	-31.7	187	3118
		Kennewick 10SW, Wash.	457	-27.2 [a]	183	2630
		McNary Dam, Wash.	106	-30.0 (11) [b]	212	3265
		Pasco, Wash.	185		206	3199
		Paterson, Wash.	115		181	3411
		Priest Rapids Dam, Wash.	140	-23.9 (8) [b]	203	3680
		Prosser, Wash.	256	-30.0 [a]	157	2427
		Sunnyside, Wash.	228	-31.1	158	2662
		Wahluke, Wash.	127	-30.6 (39) [b]	195	3920
		Walla Walla, Wash.	289	-27.8	174	3153
		Walla Walla AP, Wash.	357	-27.8	202	2853
		Yakima, Wash.	323	-31.1	177	2293
	WENAT-CHEE	Ephrata, Wash.	381	-29.4	186	3220
		Wenatchee, Wash.	193	-30.6	188	2718
		Wenatchee AP, Wash.	375		187	2751
	NEZ PERCE	Lewiston, Ida.	230	-23.9	179	2612
UPPER SNAKE		Huntington, Ore.	655	-26.1 [a]	170	3439
		Vale, Ore.	701	-33.3	141	2623
		Boise, Ida.	827	-28.3	174	2558
		Glenns Ferry, Ida.	783	-31.7		2863
		Payette, Ida.	655	-33.3	149	2725
OKANOGAN		Omville, Wash.	280	-28.3	173	2498

Proposed Parameters for Viticultural Areas in the Pacific Northwest

Viticultural Area		Elevation	Expected 20-year Minimum Temperature	Frost-free Season (Days between 0°C temperatures)	Degree-Days April - October (base 50°F)	Annual Precipitation
PACIFIC BORDER	WILLAMETTE	30-230 m (100-750 ft.)	-16 to -20°C (+3 to -4°F)	160 to 280 days	1800 - 2400	10-60 in.
	UMPQUA	100-300 m (325-1000 ft.)	-16 to -20°C (+3 to -4°F)	180 to 240 days	2000 - 2400	30-50 in.
	SISKIYOU	200-600 m (650-2000 ft.)	-16 to -20°C (+3 to -4°F)	160 to 180 days	2000 - 2900	20-40 in.
COLUMBIA BASIN	CELILO	30-150 m (100-500 ft.)	-29 to -33°C (-20 to -27°F)	160 to 210 days	2000 - 3200	10-30 in.
	UMATILLA - YAKIMA	50-300 m (160-1000 ft.)	-28 to -32°C (-18 to -26°F)	170 to 210 days	2400 - 3900	6-15 in.
	WENATCHEE	180-400 m (600-1300 ft.)	-29 to -32°C (-20 to -26°F)	180 to 200 days	2400 - 3200	8-10 in.
	NEZ PERCE	200-300 m (650-1000 ft)	-26 to -32°C (-15 to -26°F)	160 to 180 days	2400 - 3200	10-15 in.
UPPER SNAKE		600-900 m (2000-3000 ft)	-26 to -33°C (-15 to -27°F)	140 to 180 days	2400 - 3400	8-12 in.
OKANOGAN		250-400 m (800-1300 ft.)	-26 to -32°C (-15 to -26°F)	160 to 180 days	2400 - 2800	10-15 in.

Note: Values used to define area limits are underlined.

XHIBIT 1

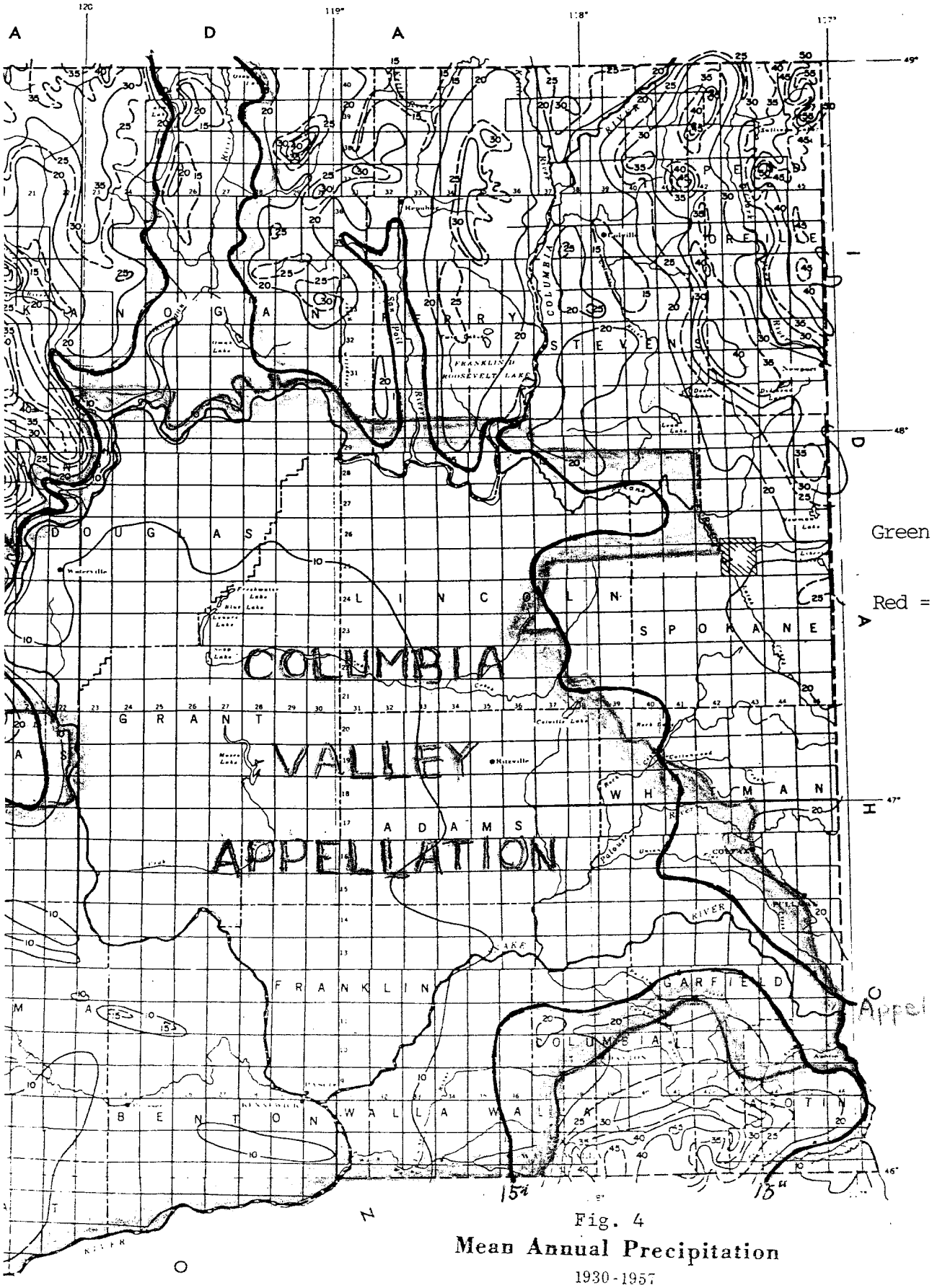
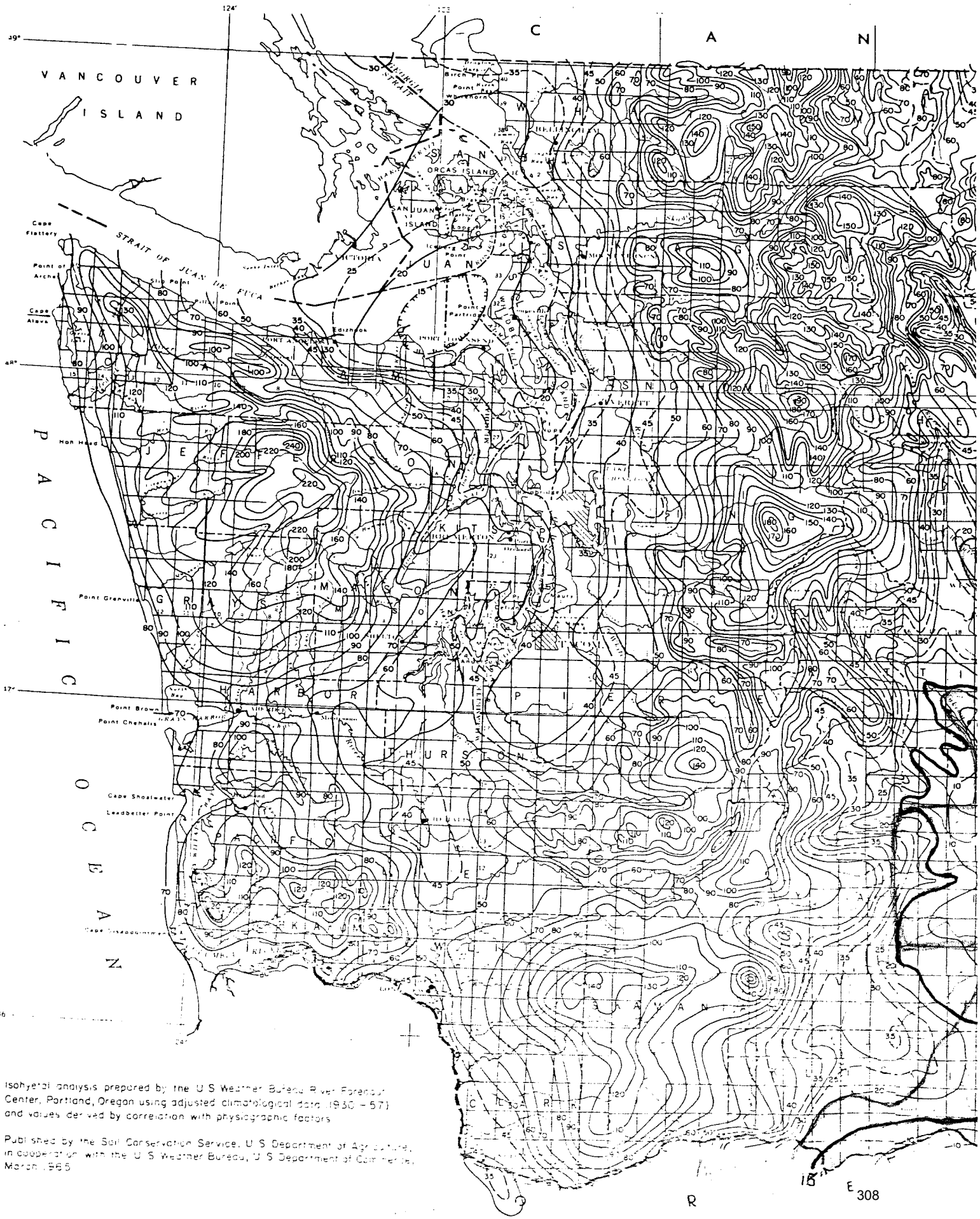


Fig. 4

Mean Annual Precipitation

1930-1957

STATE OF WASHINGTON



Isohyetal analysis prepared by the U S Weather Bureau River Forecast Center, Portland, Oregon using adjusted climatological data (1930 – 57) and values derived by correlation with physiographic factors

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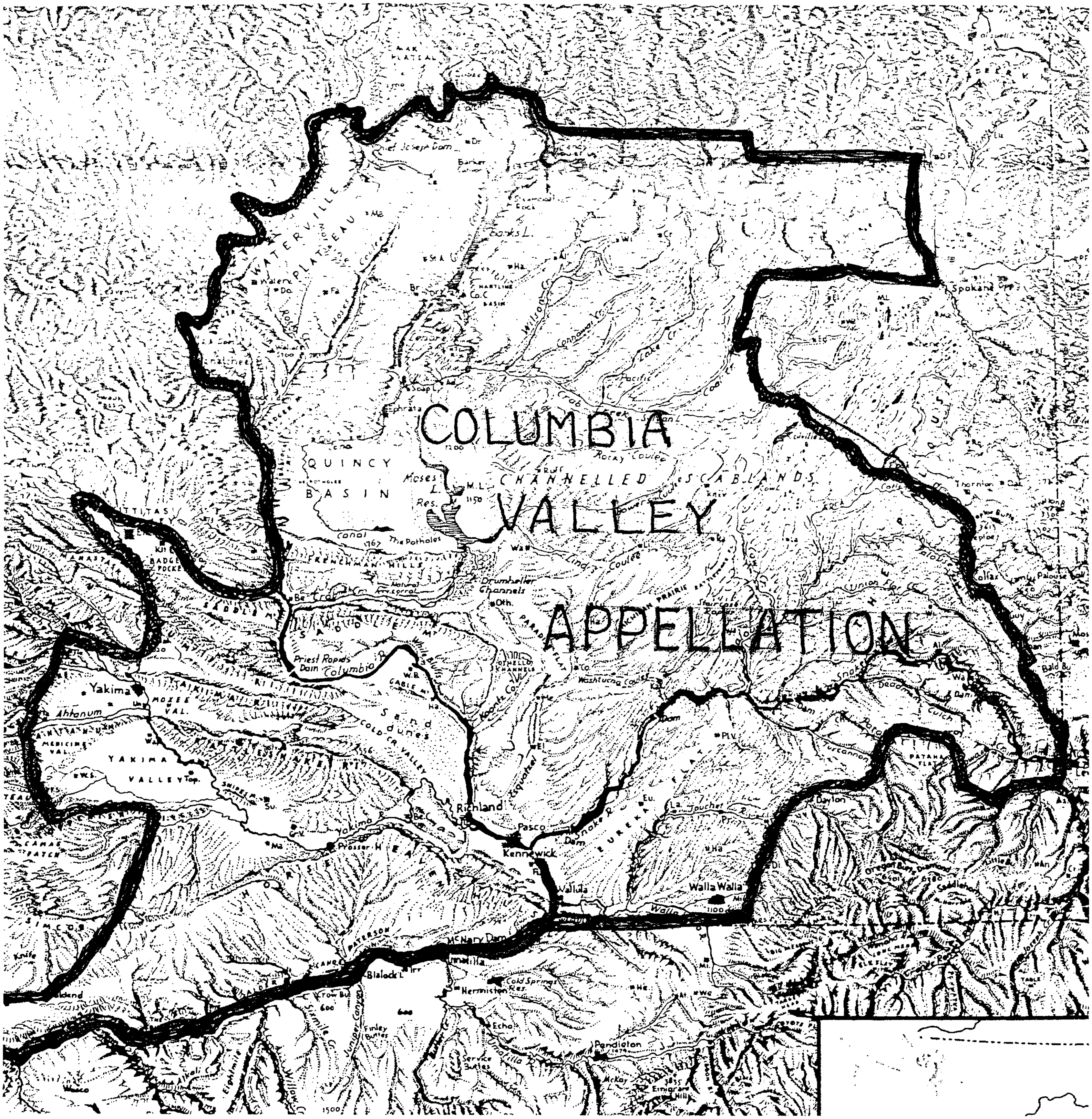
COLUMBIA
VALLEY
APPELLATION
QUINCY
BASIN
CHANNELLED SCABLANDS
Yakima
YAKIMA VALLEY
Richland
Pasco
Kennewick
Wallula
Walla Walla
McNary Dam
Hermiston
Pendleton
Spokane
Priest Rapids Dam
Moses L.
The Potholes
Drumheller Channels
Prosser
Dayton
Sand dunes
Banks L.