HORTICULTURE
OF THE
WENATCHEE VALLEY

Thesis for Degree of M. Hort.

Durward Frederick Fisher.

1917

Fruit-culture - Washington (State)

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INTRODUCTION

Other States produce more apples than Washington, indeed it is but 11th in the list of apple producing States, but as its production is limited to a few favored localities it can boast the most highly specialized and intensive apple growing industry in the world. The commercial apple yield of the State can be credited largely to the districts known as the Wenatchee and Yakima Valleys. There are a few other districts where apple growing assumes major importance, but the aggregate production of all does not approach that of either Wenatchee or Yakima.

Other deciduous fruits are grown in large quantity in the Wenatchee Valley but the apple is by far the most important crop. An account of the horticultural industry of this region therefore resolves itself very largely into a story of the foundation and development of its apple growing industry.

GEOGRAPHIC LOCATION

The Wenatchee Valley covers no such extent as any of our major river valleys, and indeed, geographically, it might be considered of very minor importance. It is located in central Washington, between 47° and 48° north latitude, and just east of the Cascade Mountains.

The mighty Columbia, into which the Wenatchee River empties,

receives its flood and registers no sign. The majestic Cascade Range, where the Wenatchee finds its source, raises its snow-clad peaks across the head of the Valley, shutting it away from the Pacific Coast. To the east stretch miles of sand and sage brush, a region of hot winds and desolate outlook. To the north it is much the same, but with many spurs of mountains and foothills, a country largely treeless and, in summer, dry, brown, and seared even as far as the Canadian line. To the south the granite range of the Wenatchee Mountains cuts off the Valley from a similar region, the Yakima Valley.

In such isolation it is not surprising then that the Wenatchee Valley is little known, and is not mentioned in the school geographies. The chances are that unless one has noted some particularily beautiful apples on a fruit stand, and has taken the trouble to look up the place labelled as the point of origin, the average person does not know where Wenatchee is.

EARLY HISTORY

A history of the Wenatchee country would not be concerned with much antedating the building of the Great Northern Railway in 1893-4. To that man of keen foresight and marvelous ability who conceived the idea of this great undertaking, to that dreamer of empire, and that empire builder, James J. Hill, does the present day Wenatchee owe its existence and horticultural prominence. Before the coming of the Great Northern only a few hardy pioneers had laboriously packed their way across the mountains from the older Yakima country to engage in stock ranging. A few fruit trees were planted where water for irrigation was available and

gave surprising results, but it is probable that fruit growing on a commercial scale was hardly dreamed of.

The commercial plantations were not begun until the development of irrigation projects was begun. Practically the entire district was waste land until this time. Such then, was the region which has since developed into its present preeminent position as a deciduous fruit growing section. The district has suffered all the vicissitudes of exploitation, real-estate booms, quick fortunes, and torturing failures for many people. It is now in the throes of its reconstruction period, still suffering, still hoping, still confident. An analysis of these present conditions based upon past history, and suggestions for the future organization of the industry furnishes the theme of the present discussion.

SUBSIDIARY DISTRICTS

The general location of the region has already been noted, but included in the section known as the Wenatchee country, and whose products are marketed under the name of "Wenatchee Valley Fruit", are various districts subsidiary to the city of Wenatchee, altho not actually located in the Wenatchee Valley. Indeed, the city of Wenatchee itself is not located in the Wenatchee Valley, being about three miles below the confluence of the Wenatchee and Columbia rivers.

The Wenatchee district embraces all the territory which uses Wenatchee as a shipping point. It consists of a saucer shaped pocket in the mountains, divided by the Columbia River into two nearly equal sections. It is about six miles in diameter but extends along the Columbia in both directions for several miles

and also a short distance up the Wenatchee in narrow strips along the rivers. This is the principal district of the whole Wenatchee country, and the city of Wenatchee is the commercial center of the entire north-central Washington region.

The Rock Island district is about 10 miles below Wenatchee on the opposite side of the Columbia, and is the earliest district of the "Wenatchee Valley". It has the distinction of annually shipping the first car of Winter Banana apples into the New York and Chicago markets.

Up the Columbia are several other districts, also dominated by Wenatchee, and marketing their fruit under the name of Wenatchee. Altho considerably removed from the Wenatchee Valley proper, their conditions are so nearly identical with those prevailing at Wenatchee that they may be connected with it in this discussion. These districts are, in the order met with in travelling up the Columbia from Wenatchee; Orondo, Entiat, and Chelan. Farther up is the Okanogan country, likewise tributary to Wenatchee, but so far removed, and naturally forming a separate unit of districts in the Okanogan Valley that it will not be considered here. The plantings are all young and the region has therefore not experienced the same conditions as have prevailed at Wenatchee. It is for such sections as the Okanogan to read the lessons growing out of the experiences of the Wenatchee country.

Following up the Wenatchee River from Wenatchee, and in the Wenatchee Valley proper for about 20 miles to the west are several sub-districts named from their shipping points; - Monitor, Cashmere, Dryden, Peshastin, and Leavenworth. Of these Cashmere is

the most important, and next to Wenatchee ships the greatest tonnage out of the Valley. Here the Valley widens out considerably, forming another pocket similar to Wenatchee, and cut by the Wenatchee River.

CLIMATE

The Wenatchee country is strictly an arid region. The land in its natural condition produced nothing but sagebrush except along streams, where other vegetation such as willows, poplars, service berries, and a few other trees and shrubs find favorable conditions for existence.

The summer temperature is usually high, but due to the dryness of the atmosphere the heat is seldom oppressive and relief is always had at sun-down, for immediately the temperature moderates. The nights, even in midsummer, are always agreeably cool. Winters are mild, with the temperature seldom going below zero. They are also of short duration, snow covering the ground, as a rule, for not longer than two months.

Comparatively strong winds usually prevail in the spring, but seldom do any damage. Occasionally during midsummer, and especially following a period of hot days, high winds are also experienced, sometimes accompanied with hail, which causes much damage.

The average annual precipitation for the Wenatchee country varies from 7.85" at Rock Island to 25.25" at Leavenworth, increasing with the altitude. Snowfall and winter rains account for most of the precipitation, as rain seldom falls from April to October except in elevated localities. Rainfall is nowhere depended upon for the requirements of fruit growing, except in a

few instances at Leavenworth and in isolated mountain canyons at high elevations where dry-farming methods are practised. These instances are so few that they need not be considered for practically the entire region is dependent on irrigation, and finds in it a most satisfactory means of moisture supply.

Success with irrigation is predicated upon an adequate and dependable supply of water. These conditions are admirably met in the Wenatchee country and it is plain that much of the success in fruit growing found here has resulted from these conditions.

The following tabulation compiled from the records of the Washington section of the Weather Bureau shows the average climatic conditions prevailing in different parts of the Wenatchee country in 1916.

CLIMATIC CONDITIONS - WENATCHEE REGION, WASH.
Precipitation - Yearly Distribution, 1916.

Month	Average Precipitation				
	Rock Island	Wenatchee	Dryden	Leavenworth	Chelan
Jan.	0.70	0.97	2.93	3.67	1.69
Feb.	2.69	3.20	6.31	4.92	1.23
Mar.	1.11	1.38	3.76	5.68	0.81
Apr.	0.06	0.07	0.21	0.17	0.64
May	0.33	0.10	0.25	0.64	1.05
June	0.37	1.25	1.73	1.73	0.83
July	1.07	1.40	1.02	1.02	0.30
Aug.	0.10	0.43	0.15	0.06	0.36
Sept.	0.53	0.65	0.35	0.14	0.55
Oct.	trace	0.03	0.34	0.49	0.80
Nov.	0.36	0.60	1.43	2.38	1.93
Dec.	0.53	0.55	1.81	4.35	1.88
Total	7.85	10.63	20.29	25.25	12.07

Station	Elevation	# clear days	# partly cloudy days	# cloudy days
Rock Island	633	160	148	58
Wenatchee	743	160	107	99
Dryden	960	204	87	75
Leavenworth	1158	176	101	85
Chelan	1116	118	195	53

Temperature, 1916.

Month	Mean Temperature			
	Rock Island	Wenatchee	Leavenworth	Chelan
Jan.	13.4	12.8	11.4	14.0
Feb.	27.6	27.3	27.9	27.7
Mar.	40.0	40.3	37.1	38.9
Apr.	45.8	52.1	47.8	51.6
May	56.6	56.7	51.6	56.6
June	65.0	65.2	61.6	63.7
July	68.6	67.8		67.6
Aug.	73.6	72.2		72.6
Sept.	65.8	62.4	57.6	63.5
Oct.	51.4	50.6	48.8	51.0
Nov.	34.0	33.8		34.4
Dec.	23.4	22.9	21.4	23.2
Annual	47.6	47.0		47.1

Records have not been maintained long enough at some of the stations to give exact data on normal weather conditions. However, the year 1916, records of which are given above, can be regarded as quite typical, and in general as representative of average conditions.

The influence of topography on climate is here shown to a remarkable degree. The high Cascade range to the west practically shuts this section off from the moderating effects of the winds from the Pacific. This interception of the moist air currents by the mountains gives the region its low annual precipitation. The air, moving from the west, loses its moisture as it is cooled in passing over the mountains, but in descending on the east side is dynamically warmed so that it blows over the Wenatchee country as a dry wind, and favors clear skies and scant precipitation.

The wide daily range of temperature is accounted for by the very slight moderating effects felt from ocean winds, and the air, being deprived of most of its moisture allows great radiation of heat during the night.

LENGTH OF SEASON

The length of the growing season and freedom from killing frosts has had an important bearing on the success achieved here in the production of fruits. A crop of apples has never been lost because of frost, and rarely has any material damage whatever been reported. Cherries, peaches, apricots, and pears have occasionally been damaged, but not to such an extent that any grower has ever felt the need of resorting to smudging or orchard heating. There is not a single orchard in the Wenatchee country which is equipped for fighting frost.

The following tabulation presents the average date of the first killing frost in the fall and the latest in the spring for different sections of this region.

Place	Earliest Fall Frost	Latest Spring Frost
Rock Island) Wenatchee)	After October 15	April 15 to May 1
Monitor) Cashmere)	October 1 to 15	May 1 to 15
Dryden) Leavenworth)	September 15 to October 1	May 15 to June 1
Chelan	September 15 to October 1	After June 1

The influence of elevation in these different parts of the region is very marked on the blossoming season of fruit trees. There is approximately a difference of about 10 days in the blossoming season of any particular variety of fruit for each 100 ft. difference in elevation. Trees are past the blooming period at Rock Island before they have begun to bloom at Wenatchee, while at Cashmere their season is about two weeks later still. Destructive frosts, while

prevailing later at the higher elevations are not more liable to affect the bloom. Early fall frosts never affect the crops adversely, and indeed are regarded as favorable influences on the coloring of the apples. "Freezes" late in the fall sometimes cause much damage in cases where growers have been dilatory in their harvesting operations. In 1916, a year of exceptionally heavy crop that taxed to the utmost all the facilities for handling the fruit, found a large quantity of apples still in the orchards after Nov. 15. Probably as many as 500 carloads were frozen, but prompt action and careful handling in thawing out the fruit reduced the loss to an estimated total of but 100 carloads.

SOIL

The soil of the Wenatchee country is very fertile, with great moisture holding capacity, and is regarded as peculiarily adapted to orcharding. It has been described by Prof. Henry Landes, State Geologist of Washington, as follows.

"The soils of the Wenatchee Valley are mainly of two types, namely, the broad alluvial fans which are located at the foot of the steeper slopes and which appear to the best advantage in the sweeping semicircle which contains the town of Wenatchee and its neighboring orchards. At the mouths of each of several canyons these fans have been formed. The canyons have been carved mainly in the upturned sandstones and clays which come originally from the granite rocks. Above the town of Wenatchee, continuing up the Valley, while there are occasional fans, the river terraces are much more conspicuous. The terraces are composed at the base of glacial bowlders and gravels. Upon these one will find river gravels

and sands. The soil to a depth of several feet, which has been superimposed upon the the gravel and sand, is largely of eolian origin and hence is very fine in texture and retains the moisture very readily.

" In general, one might say that thruout the Wenatchee Valley the bedrock is represented by upturned layers of sandstones and shales of lacustrine origin. Next comes a subsoil which is very coarse at the base, but grading upward into gravels and sands of river origin. The top soil, varying from a few inches to a hundred feet, is of very fine grain, and in the main has been carried to its present position by the persistent winds which come out of the mountains to the westward. The soil is loamy in character, and varies from a fine silty loam thru coarser grades to a sandy loam. Rarely is it composed mainly of sand, but in general it has the right physical properties to retain moisture with readiness. Chemically, it is good in iron, lime, and potash, but is low in nitrogen."

It is also very deficient in humus, and unless the requisites of nitrogen and humus are supplied it soon becomes unprofitable. Trees take on a sickly yellow color and yield constantly diminishing returns, due to lack of nitrogen, while the lack of humus results in a poor physical condition of the soil. It puddles easily and develops a hard impervious crust thru which water penetrates with difficulty.

Alkali in the soil is not uncommon. Both the black alkali and the less feared white alkali form incrustations along irrigation furrows, and in other places from which water has dried. The contour of the land is such, however, that drainage is not a matter of concern, and hence destructive deposits of alkali, such as are

commonly met with in many other irrigated districts are here seldom found. The Valley being so narrow, with the orchard lands sloping from the mountains on either side down to the rivers gives adequate natural drainage, and prevents the accumulation of drainage and seepage waters with their destructive alkali content.

The foregoing resume of natural conditions prevailing in the Wenatchee Valley has been emphasized because these conditions have been important factors in the success which has attended the fruit growing industry of the section. A naturally fertile soil, an ideal rainless climate, an abundant and dependable irrigation supply, and a people unfettered by traditional customs and methods - a people anxious for the modern scientific instruction in fruit growing which the State has furnished them - these are the conditions which have spelled success for Wenatchee in growing fruit.

How the natural advantages of this section, briefly described above, have been utilized and exploited in fruit growing may now be considered, and how these same advantages can most profitably be used in the future constitutes a question of very serious moment for the huge industry that has been built upon their foundation.

DEVELOPMENT OF THE HORTICULTURAL INDUSTRY

It has already been stated that fruit growing constitutes the basic industry of the region, - that orchards cover practically every acre of tillable and irrigable land. A glance at the growth of this industry thru a comparison of statistics showing the shipments of the different fruits since the industry became well established will be instructive. The following tabulation presenting these statistics is compiled from records of the District Horticultural Inspector.

CARLOAD* SHIPMENTS OF FRUITS FROM THE WENATCHEE COUNTRY

Fruit	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916
Apples	616	900	747	2428	2000	3990	4107	5500		7281
Pears	45	60	65	90	135	216	186	350		337
Peaches	301	395	2	341	413	536	421	200		178
Cherries	10	10	5	18	30	42	70	80		93
Plums	65	70	45	35	35	42	37	80		24
Apricots	29	45	4	60	75	121	150	155		85
Grapes	3	5	2							
Berries	12	6	3							
Melons	221	427	75	46	50					

No records available

*Minimum carload requirements of the Gt. Northern Railway

Apples	630 boxes
Pears	550 "
Plums and Apricots	800 crates
Cherries	2000 boxes
Peaches	1100 "

The total shipments of apples from the State of Washington in 1916 are given by the State Horticultural Commissioner as 16000 carloads. Wenatchee must therefore be credited with nearly 50% of the total apple production of the State standing 11th in the list of apple growing states. This means that the Wenatchee country shipped more apples in 1916 than the entire states of Wisconsin, Maryland, New Jersey, Vermont, Connecticut, New Hampshire, Idaho, and 16 other states of lesser importance in the apple industry. In round numbers this crop of apples returned approximately $4,500,000.00 to the growers of this section. Soft fruits increased the total to nearly a million more.

The present magnitude of the industry is further shown by the accompanying statistics shewing the number of trees of different varieties and ages planted in this district. The data was collected and published by the Wenatchee North Central Washington Growers League. The small number of recent plantings demonstrates the fact that the available acerage is now nearly all occupied. The

trend of opinion in planting is further indicated by the totals for the different varieties at the different ages.

IRRIGATION

The Wenatchee River and its tributaries form the principal source of supply of irrigation water. A few pumping projects are maintained along the Columbia River and for orchards above the canals, but most of the orchards are below the canals where gravity distribution is possible.

The development of the horticultural industry has been dependent on the development of irrigation projects. The earliest irrigation ditch was constructed in 1883 and is still utilized. 600 acres additional were brought under irrigation in 1896 by the construction of the Gunn Ditch. A number of other projects have since been developed, the chief of which is known as the High Line Canal. A large proportion of the acerage of the Wenatchee country is watered by this canal, and hence the completion of this project really marked the beginning of Wenatchee's prominence in the horticultural industry.

This canal is taken out of the Wenatchee River near Dryden. Most of the orchards from Cashmere to Rock Island, as well as many between Dryden and Cashmere are supplied from this source. In 1916 a total of 10581 acres were irrigated from this canal. Its total capacity is 130 second feet at the intake, but not all the water has thus far been used for irrigation purposes. The canal was completed by a private company in 1903. The corporation sold perpetual water rights of ½ miner's inch of water per acre to land owners at a price of $125.00 to $150.00 an acre, agreeing to furnish in perpetuity this amount of water thruout the growing season,

(April 15 to October 15). The land owner, on his part, agreed to pay annually his pro rata share of the expense of the upkeep of the canal. When land is transferred to new ownership the water right is ordinarily included in the deed. When all the water in the canal is allotted the canal property passes from the hands of the corporation to the ownership of the land owners, and is operated by them. In 1916 the High Line Canal became the property of the Wenatchee Reclamation District, composed of all the land owners receiving water from the Canal. The affairs of the District are in charge of officers elected by the property owners. Practically all of the irrigation projects of the Wenatchee country are organized and managed on the same plan as that followed in the case described above.

A constant measured quantity of water is delivered to each orchard and is available for use when desired. Practically all of the irrigable land of the wenatchee country is now utilized for orcharding under the irrigation system but not more than one fourth of the minimum flow of the Wenatchee River is used, hence a water shortage is out of the question for a great majority of the orchards. With a dependable water supply constantly at hand the grower is enabled to plan his operations with a certainty. The uniformity of the trees in a Wenatchee orchard, so commonly remarked by visitors is largely the result of this condition.

The rapidity of the growth of trees here is also a constant cause of surprise and question to visitors. Apple trees commonly commence to bear at 3 years of age and at 4 years are expected to bear a box or two, while at 5 years an orchard is considered in

commercial bearing, and will yield as high as 6 or 7 boxes per tree, depending on the variety. At 10 years all varieties are mature, and yield phenonemal crops, as high as 40 boxes per tree being known at this age. It is thus seen that trees are here forced into bearing and into maturity at about half the age commonly required in the east.

The evidence in this connection seems to indicate that the date of bearing of fruit trees is dependent on their acquiring an adequate size rather than the attainment of a particular age. This perhaps amounts to the same thing, for a 5 year old tree here is the equal in size of a tree of the same variety twice the age in the ordinary eastern orchard. Prime factors in the attainment of this size at such an early date in the Wenatchee country are; (1), soils rich in plant food: (2), the abundance of irrigation water to make this food available: and (3), exceptionally favorable climatic conditions, the abundance of bright warm sunshine thru the long days of the summer season, giving more opportunity for the elaboration of this plant food. (Longer days of summer are here accounted for by the relatively high latitude).

This forced growth could almost be compared to greenhouse forcing of plants, for the same factors of heat, moisture, sunlight, and rich soils apply. A season's terminal wood growth averaging above 4 feet is expected on young trees, and frequently double this amount is obtained. On mature trees an average terminal growth of at least 2 feet is expected and easily obtained by proper cultural methods. This new growth might not be hardened enough to stand the

severe winters of the East, but winter injury in the Wenatchee country is very rare. Irrigation is not usually stopped before the middle of September, but as real winter weather is not expected for three months more, at the earliest, there is no particular danger in actively continuing the growth of the trees to this seemingly late date. The degree of hardening required for the Wenatchee winters is likewise much less than that regarded as essential in the East on account of the relatively short and mild winters experienced.

From the very first the practice of planting trees relatively close together has prevailed. A few have planted even less than 18 feet apart, while others have planted as far as 36 feet apart, but the great majority of the orchards are set with trees from 18 to 24 feet apart. Economically, this close setting has been justified, for the high cost of orchards has made it essential that a maximum return be obtained as early as possible. The early bearing of the trees has made it possible to secure some returns as early as the 5th year. But the rapidity of the growth of the trees results in the production of long willowy branches which require severe heading back to insure the mature tree a proper balance, and to form stiff branches capable of holding up the phenonemal loads of fruit obtained. It may be remarked, however, that this heading back is rarely accomplished, and the common type of tree seen is one with long spindly branches which bend to the ground with every load of fruit, requiring much propping with its additional outlay of time and labor. The pruning practise of the Wenatchee country has been ill advised from the very start. This fact is all the more sur-

prising because of the avidity with which other modern scientific methods have been seized. It is perhaps accounted for by the short-sighted policy of attempting to secure a slightly increased early production at the expense of the mature tree.

Horticulturally, the close planting would not be objectionable if the trees were thinned out at the proper time. This, however, is rarely done. Where peaches and apples have been interplanted the peaches have, in most cases, been removed. This has not been done, however, because it is good orchard practise, in most cases, but because peaches have been unprofitable. Here again is an example that reflects the economic pressure which has dictated the policy of the country, and which will be more fully treated hereafter. Where apples have been planted close they have been allowed to grow until their branches intertwine in an almost impenetrable maze. If the trees had been properly headed back there would not be so much objection to leaving them unthinned for so long, but with the present practise there is no doubt that most of the orchards have been seriously impaired. Many orchards were not set on a plan that permits of efficient thinning out, and here the mistake was in the original plan and intention, but where the orchards were set with the idea of thinning them out at the proper time, as most of them were, and the plan has not been followed, economic pressure has dictated the policy pursued.

The ease of growing fruit in the Wenatchee country was early recognized, but the distance from market and the high cost of transportation encouraged no one to venture into the business on a commercial scale until about 1894 to 1900. At this time the older

section of Hood River, Oregon, began to place on the market a standardized pack of apples, - an astonishment to the trade, but it immediately found favor and a high price in the fancy fruit markets of the east. Wenatchee possessed all the advantages that Hood River lacked and immediately the boom at Wenatchee began. Wenatchee apples competed successfully in the eastern markets, and soon established themselves under their own name instead of masquerading as Hood River apples, as all fancy Northwestern apples had been known to the trade.

Returns as high as $5.00 and even more per box for the finest fruit were reported. Nothing but the very finest apples were shipped out. This however, included practically the entire crop for most of the trees were young and produced a large percentage of large sized fruit all beautifully colored. The crop was carefully handled, attractively packed, and guaranteed to be perfect and free from all defects, insects and fungous diseases. It created a sensation on the eastern market. The novelty of apples wrapped and packed like oranges, sized, attractively put up in boxes, and guaranteed to be perfect was a thing unheard of in most places, where the barrel with its jumble of bruised apples, all sizes, all grades or all interpertations of grade, with its interesting assortment of wormy, diseased, and defective fruit was the rule. And the Northwestern apple, particularly the Wenatchee apple lived up to its reputation - it has steadfastly maintained its high standard of grade and pack, and today bears the highest reputation wherever the boxed apple is known.

The Eastern apple grower has been slow to recognize the seriousness of this competition, but as he awakes he enviously cries,

"Beauty is only skin deep - your apples have no flavor!" The Wenatchee grower retorts, "Beauty may be only skin deep but most people see the beauty before they will taste the flavor." And it has been largely true. This fact has enabled the Wenatchee grower to induce an unsuspecting public to buy his beautifully colored Ben Davis in preference to a less attractive looking Michigan Northern Spy - and more than half of the consumers are never aware of what they are missing. They buy on looks. This is all aside from the point that a Wenatchee apple does not necessarily need to lack flavor, and that a high quality apple can possibly lose some flavor and quality thru adverse cultural conditions and still remain a good apple. If a Spitzenburg apple attains perfection in the Hudson River Valley of New York it does not necessarily mean that a Wenatchee Spitzenburg is not a good apple.

High returns continued to be the rule until 1912, altho during the latter part of this period signs were not lacking that a change might be expected. Apples still returned $1.50 to $2.00 a box net to the grower, but in 1912 the crash came, and for the first time returns were less than the cost of production, and since then the average return has been about 70¢ a box.

Until 1912 there had been only slight competition in the sale of boxed apples, and for several years previous there had been a depressed yield over the eastern section of the country. The bearing acerage of the Northwest was not large and the market was able to take for its fancy trade all the high grade boxed apples that were offered. In 1912, however, a large acerage of young orchard came into bearing, and all the older trees produced more bountifully

than ever. Local machinery for handling the crop was totally inadequate. An exceptionally heavy crop thruout the country demoralized the markets, and in consequence the Wenatchee growers met their first severe reverse. Panic immediately ensued.

Like all boom sections, Wenatchee had been oblivious to any possibility of failure, and was feverishly placing all its profits in expansion, buying more orchards, buying automobiles, wintering at expensive California resorts, living up to its income limit - and beyond, all too confident of the future. The shock of 1912 demoralized the industry, but it was only the beginning of a period of reverses that has ushered in the present reconstruction era, out of which Wenatchee should emerge chastened, and with its basic industry finally established on a firm basis.

The early phenomenal returns, together with a realization of the wonderful productive capacity of Wenatchee apple orchards precipitated the boom in the beginning, and has been the cause of rapid development for the country and the failure of so many people who have been lured to it. Land prices jumped and soared to points seldom heard of in connection with agricultural land values. Raw land with its sage brush and huge boulders still undisturbed sold as high as $600.00 an acre without water right. Bearing orchards sold as high as $4000.00 an acre, and instances are on record where even higher prices were refused. Most of the orchards sold above $1000.00 an acre, and with the high returns of early years paid good interest on such an investment. But there has never been any sound basis for land valuation. Orchards were eagerly bought at almost any price, and the constantly increasing demand, as more

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and more people were allured to the country by the fabulous tales given out from it, inflated the values beyond all reason or accounting. Even at present there is no real basis for valuation, and there cannot be until after the period of readjustment.

The system of orchard valuation employed by the Assessor of Chelan County, which includes most of the Wenatchee country, is illustrated by the accompanying blank form used in this work. On it are indicated the various factors taken into consideration in arriving at the valuation, such as whether or not the land is improved, the character of the soil, the water right, and the topography, the kinds of fruit grown, and such factors as are considered as justification for deductions, such as the necessity of pumping water for irrigation, poor location, &c.

Using this system of valuation the following figures for 1916 were arrived at for 1st class orchards in different sections of the County, where there was 1st class water right, trees 10 years old or older, and where soil, topography, and varieties all graded 100%.

Place	Valuation
Wenatchee and Cashmere	$1080.00 per acre
Dryden and Peshastin	900.00 " "
Entiat	880.00 " "
Malaga	720.00 " "

Of the above amounts, one-third represents the valuation on land and water right, and two-thirds the valuation on the trees. The average assessed value of all irrigated orchards in Chelan County in 1916 was $288.00 an acre, which represents 50% of their actual value on this basis of figuring.

The following varieties are rated as 1st class in these computations:- Winesap, Rome, Delicious, White Winter Pearmain, Stay-

man, Black Ben pavis, Arkansas Black, Jonathan, Spitzenburg, King David, Yellow Newtown, Winter Banana, and Grimes. The 2nd class includes all pears, and all other apples, while the 3rd class takes in all the soft fruits except prunes, which receive a special valuation of one-third that of 1st class apples. The 2nd class receives a valuation of 75% of that given the 1st class, and the 3rd class receives $50.00 an acre in addition to the valuation of the land and water right.

1st class topography, consisting of land level and smooth receives a grade of the full 30% accorded to it in the scale. 2nd class topography, consisting of gently rolling land is graded at 15%. 3rd class topography, consisting of very rolling, but tillable and irrigable land is graded at 10%, while 4th class topography which consists of all land too steep and rough for cultivation is graded at only 5%.

Soils are likewise graded on the same scale, and 1st class soil represents land free from rock and gravel and of good depth; 2nd class soil represents land with some gravel but of good depth; 3rd class soil is land very gravelly and rocky or shallow; 4th class soil is waste land.

1st class water rights are those provided by the best irrigation projects, where water supply is reasonably certain, and constitutes about 75% of all the water rights.

Deductions are made in the case of land irrigated by pumping. For a 50 ft. lift there is a deduction of 30% from the land and tree valuation; for a 100 ft. lift 40%; for 150 ft. 45%; for 200 - 250 ft. lift 50%.

The system employed here is perhaps the most intricate to be

found in the United States. It has grown out of the peculiar conditions surrounding the orchard industry of the Wenatchee Valley, and represents the results of years of effort to arrive at this data. It is perhaps the most scientific system of land valuation in use anywhere. However, the basic figures are more or less arbitrary and are subject to change. In 1914 the valuation accorded 1st class orchards at Wenatchee was $1500.00 an acre instead of $1080.00, the reduction having been made by the Assessor after a realization of the deterioration of values which is at present taking place.

After Wenatchee was embarked on its real estate boom, which has hardly been paralleled in the history of horticulture, speculation in land became the chief occupation of many of the people, and fruit growing became of secondary importance, being taken more or less for granted. The more accessable and desirable lands were quickly appropriated for use by actual settlers who cared for their orchards personally. The high cost of the land required an outlay for a few acres commensurate with the value of a large farm in most parts of the country. Consequently most of the holdings were small, averaging at Wenatchee less than 10 acres, with many from 3 to 5 acres each. This insured thick settlement, and today the whole Wenatchee country is very like a spread-out village, with houses only a short distance apart. This influx ofpeople anxious to own and operate their own places eliminated from the best parts of the Wenatchee country the "investment"schemes which have disgraced so many of the Northwestern apple sections. These schemes were built around the desires of people of small means to own an orchard tract. The promoters acquired sufficient land and divided it into small tracts to sell

on the installment plan - agreeing to plant and care for same until it reached the bearing age, meanwhile the purchaser could continue at his vocation, earning money to pay for the orchard. Such schemes have happily not been able to flourish in Wenatchee, where actual settlers were flocking to secure all the available land. But unscrupulous real estate promoters, using Wenatchee's reputation as a bait actually perpetrated many frauds in the form of such schemes. Many of the tracts were never planted, many never existed. Others apparently tried to be honest and fulfilled their contracts, but their locations were of necessity remote from the main Valley, or were located in undesirable places. One of the most successful of such schemes is located at Manson, on Lake Chelan, a section as favored in every way except in transportation as the best at Wenatchee.

The Wenatchee people have come from every state in the Union and from all walks of life, but farmers were, perhaps, least represented of all classes of settlers. A large proportion of the newcomers were professional men and business men - lured by the call of the soil, the wonderful climate, and the seemingly marvelous possibilities of the Wenatchee apple game. It gave a population largely inexperienced in fruit growing, but unprejudiced toward the idea of learning, - an exceptionally intelligent class of people. To such as these the influence of the State Horticultural Inspection Service was of great benefit. The organization of this service is described in the attached copy of the Horticultural Laws of the State of Washington.

STATE HORTICULTURAL INSPECTION SERVICE

This influence was felt in two ways, viz; the educational work and the police work done by local inspectors. The State is divided into several Districts with a District Inspector and a corps of deputies in each, all working under the direction of a State Commissioner of Horticulture. The District in which Wenatchee is located comprises the four north-central Washington counties of Chelan, Okanogan, Douglas, and Grant.

Briefly, it is the duty of these inspectors to instruct the growers in the care of their orchards, in the control of pests and diseases, and to assist them in any way possible in the production of their fruits; - also to see that all pests and diseases are controlled in the orchards, being empowered to undertake such work at the expense of the owner if he fails to do the work himself. They are also charged with the duty of inspecting all incoming fruit and nursery stock, excluding all infected or infested, and to inspect all outgoing fruit and nursery stock, preventing the shipment of all infected or infested, and, lately, to prevent the shipment of any fruit not properly graded according to the standard grading rules of the State.

In this capacity efficient men who have served as inspectors in the Wenatchee country have been of immeasurable service to the inexperienced growers. Without their advice and help, furnished gratis upon application, Wenatchee could not possibly have made the consistent and successful progress for which it has been noted. Perhaps nowhere else has scientific advicebeen more consistently adhered to. This has been because the great majority of the people

realized their lack of knowledge and experience, and, being most anxious to achieve the highest success, applied for the best advice and adopted it.

This condition also gave rise to a new profession, that of "Consulting Horticulturist", which has been variously used and misused. Some able horticulturists have engaged in this work, charging for their advice or superintendence of orchard properties. Others, without adequate qualifications, seeing the possibilities for financial gain in this work, have mulcted many a grower for questionable service.

Another influence of the State Horticultural Inspection Service is found in its police work. It has been made impossible, by enforcing a stringent law on this subject, for growers to neglect their orchards and still make a living. Fortunately for Wenatchee the catalog of pests and diseases which prevail here is a short one.

Practically the only pests of importance are the San Jose scale and the codling moth, and only the latter is at all widespread. Fire blight has been rigidly controlled and never has secured a firm foothold. Whenever it has shown itself it has been eradicated at once, infected trees being ruthlessly destroyed or cut back beyond the points of infection. Blight has been the particular foe of the industry most carefully watched by the inspectors. The disease has been so thoroly advertised, and the examples of less fortunate districts, damaged or eliminated as fruit centers because of blight, have been so constantly before the minds of the growers here that all are on the watch for it, and most anxious to cooperate with the inspectors to protect their high priced investments.

If a man does not report his infection his neighbors do, and willy nilly the inspector uses his ax, and patrols the neighborhood until he is sure the disease has been eliminated.

San Jose scale is also dealt with severely. In case a grower fails to eradicate the pest the inspector will, after proper warning, see that the orchard is efficiently sprayed or is chopped down. San Jose scale still exists in the Wenatchee country but it is rigidly controlled.

Codling moth is the worst pest the Wenatchee grower has to fight. There are always two broods and often a part of three. Due to the difference in elevation of different sections the proper spraying date varies. It is here that the help of the inspector is again invaluable. He maintains breeding cages in such sections that he can advise any grower as to the proper date for spraying, - information most of the growers would otherwise not be able to obtain. Growers usually spray very thoroly for codling moth - since wormy apples are unmarketable, but since the period of low returns there has been a marked tendency to slight this work, resulting in much loss. This culminated in 1915, when many orchards yielded from 25% to 50 % wormy fruit, while properly sprayed orchards alongside yielded crops 95% to 98% sound, the proportion usually sought for.

There exist other pests such as the peach twig borer, the salmon fly, which destroys blossoms of apricots and peaches, woolly aphis, rosy aphis, and green aphis, but none of them can be classed as of major importance, and all are successfully dealt with.

Collar rot of apple trees is assuming serious proportions, and as yet no satisfactory method of prevention has been found. When

discovered in time trees are often saved by cleaning out and disinfecting the injured areas, or by bridge grafting, but more often the disease has progressed too far before the grower is aware of its presence.

Apple and peach mildew have at times assumed epidemic proportions but do not appear to have become endemic. Apple mildew yields to treatment with sulphur sprays but their use during the hot summer months of this climate is attended with severe risk of fruit injury.

Apple scab and other fungous diseases common to most fruit sections are unknown and probably will never prevail in the Wenatchee country because of its arid climate. The comparative freedom of this region from insect pests and fungous diseases constitutes one of its superior advantages as a fruit growing section. The maintainence of this advantage is insured by the State thru its Horticultural Inspection Service, which is always on guard against the introduction of new pests and which is constantly fighting those already established.

A further healthy stimulus to the industry is afforded by the inspection service in the inspection of fruit shipments. No diseased fruit and no fruit infested with any insect is allowed to be shipped. The inspection of a crop of the magnitude now produced by Wenatchee involves a herculean task and an efficient organization. How well this is accomplished is evidenced by the high reputation borne by Wenatchee fruit and pack in the trade circles.

GROWERS' COOPERATIVE ASSOCIATIONS

This reputation would not, however, be possible without the hearty cooperation of the shipping organizations which market the fruit. They are constantly in touch with the trade and realize to the full what the high standard product so far maintained means to Wenatchee. They have often had far more stringent grading rules than those provided by the State and most of them have exerted a restraining influence on the inclination of growers to market low grade fruit. Recent laxity in cultural methods has resulted in an abnormal amount of poor fruit being thrown on the market. The results were so highly disastrous that there is now evidence that Wenatchee is returning more firmly than ever to the idea that her greatest success is dependent in the maintainence of a strictly high grade product.

To these growers' cooperative associations is due the development of the art of packing apples and other fruits in the attractive manner they are now found on the markets. They have also been active in disseminating the best information obtainable in regard to cultural methods and general orchard practices, always endeavoring to have their growers produce the highest percentage of extra fancy fruit.

Naturally however, their chief function has been the marketing of the orchard product. In the early years there was but one cooperative organization handling any considerable tonnage. This was the Wenatchee Valley Fruit Growers Association, a strictly cooperative growers' organization, which has lately been succeeded by the Wenatchee Northern Warehouse and Marketing Co., a private

corporation operating on a cash basis. The old Wenatchee Valley Fruit Growers Association had but one competing concern of prominence, the Wenatchee Produce Co., which operated on a brokerage and commission basis. With the growth of the industry, however, other organizations have entered the field until in 1916 they numbered a score or more.

These concerns do a general warehouse and marketing business, pooling the crops of all their patrons. It has been noted that most of the orchards are of small acerage, and each has several or, too often, many varieties of apples, so that from many varieties a grower could not secure tonnage enough to ship in carload lots, which is a necessary consideration due to the location of Wenatchee at such a distance from the great markets.

It is generally recognised in the Wenatchee country that the marketing of the fruit is a business in itself, and is beyond the province of the grower - hence the field of the shipping agency or cooperative associations which warehouse, load, ship, and sell the fruit for a certain fixed charge, usually 10¢ a box. By the enforcement of standard grading rules they are enabled to pool the fruit from a number of growers without danger of injustice to any, and enabled, furthermore, to have a working basis for the sale of the fruit in carload lots.

They maintain sales agencies all over the country and in foreign markets. They not only market his fruit for the grower, but also buy for him such supplies as boxes, paper. nails, and spray materials. By purchasing in large quantities they are enabled to get the minimum price and the grower has the benefit for they add merely the cost of handling. They also act as bankers, loaning

the grower a certain specified amount to handle his crop. The usual advance is at the rate of 50¢ a box on the estimated yield.

The marketing agencies have had an important role in the development of the fruit industry of the Wenatchee Valley,-their function has been indispensable. Until 1912 their service was satisfactory, the bulk of the business being done on a cash basis FOB Wenatchee. But in 1912 the markets were demoralized. Eastern markets were flooded, and there was no adequate machinery in the Wenatchee country to handle the immense crop. Returns were far below the cost of production. Growers blamed the shipping agencies, rancor was stirred up, many growers pulled away from old affiliations and new concerns were formed. Since then the marketing situation has steadily become more complicated. Growers have gone from one organization to another, from one plan of marketing to another, never holding together long enough in any one organization nor combining enough tonnage at any time to give it a chance to demonstrate its capacities. They have constantly grown more suspicious of all agencies and more disrupted among themselves.

In 1916 the growers formed a large organization which was pledged to sell for cash only. They look with disfavor on all agencies which do not deal on this basis. The panic which followed the marketing of the 1912 crop is primarily responsible for this condition. The selling organizations lost no money thru that deal for their charge of 10¢ a box was fixed, regardless of the return to the grower. Taking advantage of the state of mind of the growers at this time new organizations were able to enter the field and compete for tonnage and a share in the sure profits of the market-

ing business. Many of these were organized by growers to save this cost but these compete as sharply as any. The tonnage was divided, the handling and sales machinery were duplicated in each concern, and the same markets invaded with attendent price cutting and loss to the grower all around.

The marketing agency which in early years formed so necessary a cog in the machinery of development of the fruit industry has become a source of friction that demoralizes the business. The idea that cooperation among fruit growers of the Northwest has been ideally perfected is entirely erroneous. A measure of cooperation is absolutely essential in order to get the fruit from the small orchards onto the market, but the cooperation which has existed for this purpose in recent years has not gone much further - certainly it has not, in most instances, worked for the maximum financial benefit of the growers. That this is being recognized and that the necessity of a change is realized by the shippers is shown by the number of concerns which have recently begun to operate on a cash basis. On his part, the grower has reached the point where he is quite willing to let the other fellow speculate with the fruit and is satisfied with a price sufficient to yield a reasonable profit. He is no longer out to make a "killing" - he is now most anxious to make a living. As long as this attitude is maintained the situation should improve. The intricacies of the marketing situation cannot be gone into further within the limits of the present discussion, for in themselves, they present a separate and major problem.

PRESENT STATUS OF THE INDUSTRY

The recent demoralization of the fruit growing business cannot be said to have undermined the industry or in any way threatened its prominence in the Wenatchee country. It has rather seemed to emphasize the fact that fruit growing is firmly established as the leading industry of the section and that it must be readjusted to insure stability in the face of adverse conditions. There is no idea of supplanting the orchards with other agricultural crops. It is realized that no other crops so lend themselves to specialization on high priced land as do fruits. So instead of resulting in the failure of the industry the recent panic has merely pointed out the glaring defects which have developed and changes essential to be made. Under the old system profits were possible only under favorable market conditions and lack of competition. The fruit growing industry must now undergo reorganization and readjustment so that it will be stable under ordinary market conditions and in the face of stern competition.

The foundation of the horticultural industry is unquestionably the growing of apples. Reasons for this are plain. The apple is more of a staple than any of the other deciduous fruits. It lends itself to long distance shipment and to long periods of storage. It is therefore the fruit which best meets the conditions imposed by Wenatchee's geographic location at a great distance from the principal fruit markets. Another factor which has already been brought out is that Wenatchee can produce this fruit in perfection. The cool nights and hot days, with abundant sunshine puts a finish and a color on the apples not found on those grown outside the Northwest. The peculiar advantages of soil, irrigation, and climate

produces a higher percentage of large sized apples than is found in Eastern fruit. All these conditions unite to create a demand for the Wenatchee product and make the apple the most desirable fruit for Wenatchee to grow.

Soft fruit fillers, particularily peaches, which have not made a profitable return, are being removed in large numbers and attention is concentrated on apple growing.

That Wenatchee is unquestionably the premier apple growing district of the Northwest is evidenced by a comparison of the per cent of different grades of representative varieties shipped from the various districts. In 1914 the North Pacific Fruit Distributors reported such data. This concern shipped fruit from all the different districts of the Northwest and enforced uniform grading rules. Their records should, therefore, be reliable. The data shows that Wenatchee leads all the other districts in the shipment of extra fancy apples of a majority of the standard varieties of the Northwest.

With such a record Wenatchee is surely entitled to its boasted prominence as an apple growing section and is surely justified in concentrating attention on this phase of fruit growing. With this proof of its adaptibility to high grade apple production there is little chance for argument over the question as to whether Wenatchee should continue to grow apples. If the Northwestern apple business is overdone it is plain that retrenchment should not begin in Wenatchee but in those districts which cannot produce as good apples.

The superiority of Wenatchee as an apple producing section is further evidenced in a comparison of the cost of producing apples in Wenatchee with like costs in Hood River Valley, Oregon, and the Western Colorado districts (Grand Valley), which are, perhaps, more widely known and generally regarded as having an established apple-growing industry. It is not intended to enter into a detailed discussion of the matter of costs at this point, but for the purpose of emphasizing the advantages of Wenatchee over other districts reference is here made to reports of the U. S. Department of Agriculture, which has made a careful survey of the cost of apple production in these districts.[1]

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[1] Miller, G. H. and Thompson, S. M. The Cost of Producing Apples in Wenatchee Valley, Washington. Bull. 446. U. S. Dept. Agri.
Ibid. The Cost of Producing Apples in Western Colorado. Bull. 500. U. S. Dept. Agri.
Ibid. The Cost of Producing Apples in Hood River Valley. Bull. 518. U. S. Dept. Agri.

It was found that the average investment per acre of bearing apple orchard in the different districts was:

Western Colorado	$ 708.51
Hood River Valley	990.74
Wenatchee Valley	1925.00

The average cost of production, including 8% interest on investment was:

Western Colorado	$0.844 per box	$239.79 per acre
Hood River Valley	1.02 " "	226.96 " "
Wenatchee Valley	0.792 " "	469.72 " "

The individual items entering into the above costs, - labor, materials, and fixed costs, are all higher at Wenatchee, but despite this fact the cost of producing a box of apples is least in Wenatchee. This advantage is brought about by higher yields which offset the higher per acre costs in Wenatchee. The average yield per acre in boxes for the different districts is reported as follows:

Western Colorado	284 boxes
Hood River Valley	222 "
Wenatchee Valley	593 "

The problems confronting the Wenatchee country today may be grouped under three heads, orchard problems, marketing problems, and economic problems. They are all related and have intimate bearing on the present status of the horticultural industry. The manner in which they are met and solved will, in large measure, determine the rapidity with which Wenatchee emerges from its period of readjustment to a sound and stable economic basis.

ORCHARD PROBLEMS

The orchard problems are all connected with the ordinary orchard practises. That these problems are important and significant is indicated by the increasing amount of cull apples produced by the district, all traceable to a gradually increasing inattention to the painstaking care which characterized the early handling of orchards in Wenatchee. In the annual report of the District Horticultural Inspector for 1908 it is estimated that less than 2% of the total crop of apples could be classes as culls, but the report for 1916 estimates the culls and windfalls at 25%. Part of this increase is accounted for by a destructive windstorm which swept the upper Valley in August, but the major portion must be attributed to wormy fruit, undersized fruit, sunburned fruit, all due to conditions more or less under the control of the growers.

The growth of a more careless attitude has already been traced to the discouragement following the advent of low returns, - to the disinclination of the growers to freely risk money in costly orchard operations when commensurate returns seemed questionable. It must not be deduced from this statement that the orchards have been

neglected, as the term is commonly applied in most parts of the country. As a matter of fact orchard conditions compare very favorably with commercial orchard practises everywhere, and, judged by the same standards Wenatchee orchards would doubtless average a very much higher percent of marketable fruit than Eastern orchards, but due to superior location with reference to markets the average Eastern orchardist has a source of income in his "culls" that is denied to the Wenatchee grower. What is meant is simply that Wenatchee has retrograded from its former high standard of orcharding.

Spraying practises have been slighted, thoroness and consistency in fighting codling moth has been sacrificed thru questionable attempt to meet economic pressure. Growers who in years past have offered to pay a dollar a worm for all found in their apples - and never had to pay a cent, now find themselves with 5% to 15% and even a higher percentage of wormy apples. Lessened attention to detail caused by worry over impending financial ruin is largely responsible. With only the codling moth to confront as an enemy of prime importance the present attitude is hardly excusable.

Pruning likewise has been neglected. The common fault in the pruning of young trees which does not insure a good framework has already been noted, and has prevailed from the beginning. In pruning mature trees, however, there has in recent years, developed a tendency toward neglect to which much of the present loss can be traced.

The thick planting of trees and the lack of heading back has produced a keen competition among the trees for food and sunshine. Branches intertwine and shoot up into the air - carrying much of

the bearing surface beyond the reach of the sprayer. The intertwining branches obstruct the spray machine and make the use of a tower impossible. This condition has made effective spraying practically impossible in a large number of orchards.

The dense growth has cut off sunlight and given a higher per cent of undercolored fruit, and hence less profitable fruit. The trees, lacking the stimulus of pruning and growing older, produce smaller sized fruit - fruit likewise less profitable.

Another factor involved in the production of small sized fruit is the neglect of proper thinning. Those growers who have adhered to the original scheme of moderately heavy annual thinning have insured themselves constantly increasing crops of uniform good size and quality, while growers who no longer thin admit the unevenness of their crops, and the preponderence of smaller sizes.

The problem involved in cultivation practices may briefly be stated as "too much clean cultivation". Wenatchee orchards need permanent cover crops and not clean cultivation. It may be stated that in this connection general practice has progressed and not retrograded. That this has been in line with the least effort on the part of the grower by involving a minimum of labor and expense, is not to be doubted but its value is not thereby affected.

In the early history of orcharding in the Wenatchee country a fetish was made of clean cultivation. The soil was constantly worked and not a weed or blade of grass was allowed to show itself. Persistent stools of alfalfa were industriously attacked with a mattock, and the man who kept his orchard best tilled was considered to have the best place. Growers who allowed alfalfa to grow

among their trees to provide the forage for stock which others shipped in were regarded as lazy and hardly a credit to the community. Real estate dealers avoided such places in showing prospective settlers over the country. After a time, however, it was noticed that the orchards under clean cultivation began to have less regular bearing habits. The foliage took on a yellowish, sickly color, - the soil became more difficult to cultivate, being hard and cloddy, and it was impossible to irrigate properly. The water would not penetrate, and "hard-pan" was often spoken of. Subsoiling and dynamiting afforded only temporary relief. The orchards in alfalfa, on the other hand, continued to bear regular crops and retained their vegetative vigor, while the soil unmistakeably improved its physical condition. It was observed that these orchards, far from requiring more water supply, really took less than those under clean cultivation. It became evident that in growing alfalfa in his orchard a grower was farming two farms - one below the other, for the alfalfa roots penetrate much deeper than the apple roots and compete little if any with the trees for either food or water. The old roots decay and open up channels for irrigation water to follow, as well as furnish the humus and nitrogen so sorely needed by all these arid soils. The alfalfa stubble also serves as a trap and catches all the leaves from the trees as a further contribution to the humus content of the soil. It became known that the best method of treating alfalfa is to cultivate it thoroly in the spring before growth starts. After an alfalfa plantation is established it may be disc-harrowed almost as thoroly as an unplanted field, and the alfalfa thrives better. This early harrowing incorporates the

leaves with the soil and consequently it is yearly improved. The general practice is to remove two crops of hay and leave the third as a mulch. In this way forage is provided and more stock can be kept, adding another source of income to the orchard, as well as insuring against soil depletion.

Alfalfa is preferred as a cover crop because of its value as a forage crop and its persistence after seeding as well as because of its deep feeding habits. Other leguminous cover crops such as vetch and red clover feed in the same area as the tree roots and compete. Orchards so treated suffer all the effects noted against the practice of sowing grain in eastern orchards. It is estimated that fully 75% of the orchards in the Wenatchee country are now in permanent cover crops, while of this number practically 75% are in alfalfa.

In his harvesting operations the Wenatchee grower meets practically the only condition not under his own control. He must depend for labor on help secured outside the district. Heretofore the expert packing has all been done by local residents - young men and women of the Valley. But with the enormous increase in the amount of fruit to be packed has come the necessity for employing outside help. This has been supplied by professional fruit packers who go up and down the Pacific Coast packing oranges, canteloupes, and apples. As a rule they are not as careful or reliable as the Wenatchee packer, altho probably more swift. Scarcity of packers has constantly raised the price of packing until many of the packers are able to make from $7.00 to $8.00 a day. Other help for picking, sorting, and handling the fruit is likewise scarce

and commands good wages, from $3.00 to $3,50 a day. Itinerant help is depended upon here, men from the Coast cities, attracted by the high wages and the chance for pleasant out of door employment. But recently have come all too many of that class known as the I.W.W. They are utterly unreliable and inefficient, interested chiefly in stirring up trouble. They frequently organize strikes among the workers, indulging in intimidation and terrorism to gain their points, which having been won are discarded for new demands. Coping with the I.W.W. does not lessen the worry of the Wenatchee grower at harvest time.

Labor scarcity has been one of the main influences behind the recent establishment of central packing plants, where the work of packing is done cooperatively at a maximum of efficiency and a minimum of expense. The grower is thereby enabled to turn the efforts of himself and his family wholly to the picking of the fruit. He contracts for the hauling of the fruit to the packing plant and for the packing of the same. Usually the packing plant is operated by the selling agency, so a minimum of handling is necessary. But groups of growers, conveniently located, often organize a cooperative central packing plant and it seems that this plan must eventually find favor with all growers as it certainly is in line with any movement looking toward greatest efficiency. Few orchards have enough apples to justify the purchase of a grading machine and the other ingenious handling machinery employed in a central packing plant, and consequently orchard packing cannot be done as cheaply as in the central plant. Likewise there are few orchards equipped with the storage space to handle even a small percent of the crop,

consequently it must be removed almost as soon as taken from the trees. Usually there is not to exceed six weeks time in which to do this without danger from frosts, and this causes great congestion of work at harvest time and adds a very forceful reason for the efficient central packing plant.

MARKETING PROBLEMS

The marketing problems have been covered in a general way in the discussion of the recent period of depression following the failure to market the crop of 1912 successfully. There are, however, involved in the marketing problem several other factors which affect the present economic situation.

The lack of adequate storage facilities in the producing territory is one of the most important. In the whole Wenatchee district there are but two cold storage plants with a combined capacity of 175 carloads of apples. Most of the shipping warehouses are of frost-proof construction, and they, together with the meagre home storage facilities of the growers can handle approximately 2500 carloads in addition. This provides for only a minor portion of the crop, and necessitates the rapid movement of fruit out of the district during the harvesting season. This calls for a supply of refrigerator cars which the rail-road has thus far not been able to furnish. The Wenatchee country is served by only the Great Northern Railway, and it has about 4000 refrigerator cars. Very few of the cars loaded for distant points can make more than one trip a season, and the rail-road is not always able to secure sufficient cars from other lines to avoid a car shortage. Great congestion therefore usually results at the shipping points, and if this should come

at a time, as in 1916, when cold weather starts, severe losses result that might be avoided if adequate storage space were available.

Adequate storage space within the Wenatchee country would also obviate the necessity of shipping to distant points for this service before marketing, and would make possible a more efficient marketing service, involving less costly handling and greater returns. In years past apples which have been shipped and held in storage at distant points have, at times, sold for less than the accrued charges, whereas, if stored at home, transportation costs and some handling expense could have been avoided at a considerable saving to the grower.

The Wenatchee grower can never find himself as favored for the transportation of his product as his Eastern competitor. The City of Wenatchee is located on the main line of the Great Northern Railway, 1611 miles from St. Paul and 2042 miles from Chicago, thru which points the bulk of the fruit moves to consumption. A reduction in freight rates may possibly be looked for but in view of recent increases in costs for the railroads it is hardly to be expected. In any event it is always going to cost a great deal more to transport Wenatchee fruit to market than that grown in the great fruit districts of the East. It is a handicap which cannot be changed by the Wenatchee grower, and which must be met thru advantages in other directions if he is to survive in business. At present it costs 50¢ a box for transportation of apples from Wenatchee to Eastern markets with additional charges for refrigeration which brings the total cost of delivering a bushel of Wenatchee apples to points east of the Mississippi River from 60¢ to 65¢. The average

Eastern grower can transport at least twice the amount of fruit to the same market for the same cost. Express shipments take the bulk of Wenatchee's soft fruits, the rate being 4¢ a pound to any point east of the Mississippi, except exclusive offices of the Southern Express Co., which does not concur in this flat rate. The differential in this type of shipment still holds in favor of the Eastern shipper.

It was thought that the opening of the Panama Canal would offer some relief from the high costs of transportation, but the advent of the European war and the consequent removal of most of the shipping from the Pacific has prevented an adequate test in this respect. However, it is not likely that much relief can be expected from this source. Considerable saving might be expected if fruit could be efficiently handled by this route, but this is not the case. The greater length of time required over this route compared with the rail route precludes its use except for apples. To handle any considerable portion of the Wenatchee apple crop as well as that of the other Northwestern districts, which in all totals somewhere between 15,000 and 20,000 carloads, would require a greater number of ships to operate thru the limited apple shipping season than the traffic thruout the remainder of the year would warrant. This might not be a serious difficulty if ordinary boat facilities only were required, but efficient refrigeration is absolutely essential, and is equipment not ordinarily available - and which it would not be profitable to install merely for temporary use.

The same trouble is met in a degree in the annual refrigerator

car shortage. Refrigerator cars are expensive equipment, and are idle a good share of the year. It is unreasonable to expect the rail-road to provide itself with more than the minimum number required. Shippers, therefore, must cooperate to the fullest extent with the rail-roads. Aside from the building of adequate storage facilities, the utilization of ventilated box cars for early shipments would conserve the refrigerators until such time as danger of freezing is met thru the Rocky Mountains and the Great Plains region, and obviate in great measure the danger of car shortage.

Competition in marketing is not confined to the competition between the local agencies previously described. This is perhaps the most harmful competition which must be contended with, but there is also competition with other Northwestern districts, and with other fruit districts of the country. The boxed apple business is no longer confined to the Northwest, for the Eastern grower has taken a lesson from the early success of his Northwestern competitor and is now making an effort to secure a share of the fancy apple trade. In isolated instances some eastern growers successfully compete, and even secure higher returns for certain high grade apples in restricted markets. But it is unlikely that this competition in extra fancy apples will ever assume proportions to seriously affect the Northwestern grower, since the conditions which have forced him to put out his high grade product can never be expected to generally prevail in the East. In the past the East has produced the apples for the masses, while the Northwest has furnished them for the classes. The rapidly increasing production in the Northwest is overcrowding the fancy trade, and more and more of this

product must compete with Eastern fruit in cheaper markets. This certainly involves an economic handicap for the Wenatchee product, with its high cost of production, high transportation charges, and must induce economies thruout the industry. At the same time it is likely that the better looking Wenatchee product will sell better and the competition will induce better grading and packing practices in Eastern districts. If this should prove true consumers may eventually benefit, by receiving a better apple, more attractively presented than now can be generally procured.

Competition between districts of the Northwest is very keen. Many of the marketing agencies cover all the districts and sell the fruit in the same markets. This competition would not be so serious if each district would restrict itself to the production of only those fruits or varieties which are best adapted to the particular conditions prevailing there, but this is a utopian condition not to be expected.

The entire marketing problem could, perhaps, best be solved by the organization of all the fruit marketing interests of the Northwest in a plan patterned after the California Fruit Growers Exchange. If the bulk of the fancy apple tonnage out of the Northwest were controlled as in the case of the California citrus output, markets could be stimulated and protected in a way that is impossible under present conditions. Past attempts at such coordination of effort have all failed, but it is not unlikely that the eventual solution of the marketing problems of the Northwest will be found in this direction.

At present the cash buyer is always at hand when apples are

not plentiful, but he is absent when large crops are found in the East. When growers can sell for cash FOB Wenatchee, they can dispose of their fruit quickly and they are prosperous, but when they have to depend on a marketing agency to ship and sell in distant markets the pools are often not closed until the next mid-summer and, while advances are usually made, the grower is often hard up, and his returns are usually questionable. Some years he makes money - other years he loses, and as has proved to be the case in Wenatchee, he just about keeps even with the game. Successful years in recent times have merely given opportunity to compensate for the unprofitable seasons, and few have been able to get much ahead. It is plain that a more rational system of marketing must be evolved before the industry settles upon a firm and stable basis. At present the marketing situation is perhaps more disorganized than at any time in the history of Wenatchee. The earlier cooperation seems to have entirely broken down.

ECONOMIC PROBLEMS

Closely related to the orchard and marketing problems are the various economic problems besetting the country. The chief of these is the high cost of production.

This is influenced primarily by the high overhead expenses connected with each orchard. Most of the places are capitalized at far more than their present producing capacity would warrent. Growers are no longer assurred of interest on an investment of $1000.00 to $3000.00 an acre, and consequently land values are shrinking down more nearly to a rational level. This shrinkage of capital must go on until this level is reached. It is likely that

a large percent of the present owners will be forced out in the process for few are fortified against the losses involved. It is stated on reliable authority that 80% of the orchards of the Wenatchee country were mortgaged in 1915, and that 20% of this number also had a second mortgage obligation. Interest rates on mortgages are never below 8%, and more often are 10% and 12%. A large majority of the owners have been unable to keep up interest payments at these rates in recent years, much less to reduce the principal indebtedness. Most of them have considered themselves lucky if they broke even on the orchard and harvesting costs and made a living. Many growers have already been forced out and the property has reverted to the mortgagee. It seems that this process must go on until a point is reached where the capital is no longer watered, and where growers can maintain their liabilities.

The orchard costs, aside from the high overhead expense are likewise high, and must be reduced in order to successfully meet the competition which is lowering the returns on Wenatchee fruit.

A detailed study of the cost of producing apples in the Wenatchee Valley was made in 1914 by Miller and Thompson[1] of the

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[1] "The Cost of Producing Apples in the Wenatchee Valley, Washington." C. H. Miller and S. M. Thompson. U. S. Department of Agriculture Bulletin 446.

Office of Farm Management, U. S. Department of Agriculture. Their results, secured from a detailed survey of 87 orchards between Wenatchee and Cashmere show an average cost of $.7921 per box in clean cultivated orchards and a reduction of about .02 per box

in orchards with alfalfa or clover cover crops. These figures represent the results of the most careful and detailed investigation of the subject ever made, and may, therefore, be taken as approximately correct.

The survey above mentioned contains a complete analysis of the cost of apple production in this region, and in this connection it will be of interest to quote several tabulations showing how the cost of production is distributed.

Summary of Cost of Production

Items of cost	Total cost			% of total cost
	Per acre	Per box	Per tree	
Labor	$179.09	$0.3020	$2.211	38.13
Material	103.71	.1749	1.280	22.08
Fixed cost	186.93	.3152	2.308	39.79
Total	469.73	.7921	5.799	100.00

How these several items of cost are made up is shown by the following tabulations.

Fixed Costs

Item	Cost per Acre	Cost per Box
Taxes	$13.08	$0.0221
Water tax (maintainence fee)	1.69	.0028
Insurance	.96	.0016
Interest on investment	154.00	.2597
Equipment charge	10.42	.0176
Packing house building charge	6.78	.0114
Total	186.93	.3152

Material Costs

Item	Cost per Acre	Cost per Box
Box shooks	$62.27	$0.1050
Nails	1.48	.0025
Paper	16.82	.0284
Labels	5.93	.0100
Lime sulphur solution	8.41	.0142
Lead arsenate	4.74	.0080
Manure	3.46	.0058
Gasoline and oil	.60	.0010
Total	103.71	.1749

Labor Costs

Item	Cost per acre	Cost per box	Cost per tree
Labor before harvest (clean cultivation)	$72.64	$0.1225	$0.8968
Labor before harvest (alfalfa)	60.99	.1028	.7406
Harvesting labor	106.45	.1795	1.3140
Total labor, (clean cultivation)	179.09	.3020	2.211
Total labor, (alfalfa)	167.44	.2823	2.067

The above figures are based upon the following:

Average investment per orchard ---------- $20,974.00
Average investment per acre ---------- 2,026.00
Average size of orchard, 11.4 acres
Average size of apple orchard, 6.5 acres
Average value per acre of bearing apple orchard ------- $ 1,925.00
Average yield per acre, apples, 593 boxes
Average yield per tree, apples, 7.3 boxes

In a consideration of the above it will be noted that the fixed costs are given as approximately 40% of the total cost of production, represented largely by interest on the investment, which amounts to 33% of the total. That it must be lowered has already been shown, and it is further indicated by the fact that the costs of materials and labor must inevitably tend upward in the face of present economic conditions thruout the country. Competition and other factors are at the same time lowering the returns to the Wenatchee orchardist so that the principal way the pressure can be met is in the lowering of the fixed charges as already indicated. Savings may be made, and must be made wherever possible in labor and materials, but such savings can not alone suffice. Labor can be saved by generally adopting the central packing plant system and by bringing more of the acerage under alfalfa cover crop. Materials can be saved by marketing low grade fruit unwrapped and in less expensive containers. It does not seem unreasonable to expect that the cost of production may be lowered

eventually by at least 20%. Such a saving in the recent past would have spelled the difference between failure and success for many of the Wenatchee growers.

The Wenatchee country is essentially a one crop country both because of the limited acerage available and the high cost of the land. It has depended on the outside for stock feed, dairy products, vegetables, and meats. In the early years a cow was seldom seen on any of the ranches, and hundreds of gallons of milk were brought in daily for sale in the towns, while condensed milk was generally used in the homes of the ranchers. Butter, likewise, was shipped in, also practically all the meats. Vegetables were grown in limited quantity but the supply was never certain and grocers were forced to ship in great quantities of both fresh and canned vegetables to sell to the farmers as well as the townspeople. Happily, this unhealthy economic condition is passing and Wenatchee is now more nearly self-supporting. Now, with such a large per cent of the orchards in alfalfa nearly every farmer produces enough forage not only for his horses but for a cow or two besides, and in many cases a few hogs are also kept. There is comparatively little fresh milk shipped into the Valley and the use of condensed milk has largely decreased. Butter is still imported but not in such amounts as formerly. The home supply of meats is increased but probably can never be expected to be adequate under the intensive orchard conditions prevailing.

Vegetable gardening has become established as an important side-line on many ranches and, in season, Wenatchee does not depend on other sections for this class of food. This development has

been in the right direction and has been, perhaps, as important as any one thing in placing Wenatchee on a sounder economic basis, but the period of readjustment is far from terminated. How long it will endure depends on conditions. Occasional seasons of profit will but prolong the steps which remain to the final level of stability, when the industry may be considered upon a sound economic basis and when engaging in that industry will not be a gamble but become a business.

The principal facts in the development of the industry have been reviewed above, together with some of the causes which have seemed to influence the economic organization of the same. The text has perhaps, inferred suggestions for a more profitable organization of the business, with a better correlation of its various parts, but it may be well to gather together at this point such specific factors as seem to have an influence in this connection.

SUGGESTIONS FOR THE PROFITABLE ORGANIZATION OF THE INDUSTRY

With the revaluation of the orchards which must eventually take place two acres may perhaps be bought for the present price of one, - two orchards may be combined in one. In any event the small holdings must be eliminated. They are based on a fundamentally wrong idea of business. The small apple orchard may be compared with the small retail store or the small factory. They depend on a small turnover at a large percent profit. With the curtailment of profits(which has already come in the apple business) the small establishment is forced out in favor of the large concern which depends on a large turnover at a small percent profit, the

total of which, however, insures success instead of failure.

It is conceivable that a 5 acre orchard with a production of 2500 boxes might have yielded a profitable return when apples returned $1.50 or more a box, but when prices cannot be expected to average more than $1.00 a box, the profits accruing from this volume of business are not sufficient for the living of an average family. It is certain that the day of the small grower is past, and that henceforth we may expect the orchards to be combined in larger units, the size of which will be determined by the profits of the business, - in general, the smaller the profits the larger will be the orchards. The capitalization necessary per acre will be less than now, but the capitalization per orchard will be more.

With this readjustment of orchard acerage must come a readjustment of the makeup of the orchards. Undesirable fruits and unprofitable varieties must be eliminated. It seems probable that specialization in apple production has been carried farther than is desirable, and that soft fruits have not been allowed to demonstrate fully that they might profitably serve as an adjunct tc the apple business.

Peaches might be cited as the one exception to this statement. Peach growing has unmistakeably been demonstrated as unprofitable. To reach distant markets in the fresh condition it is necessary to pick the fruit green. The lack of flavor of such peaches is always noted. A Northwestern peach on an Eastern market is, and ought to be discriminated against in favor of its tree-ripened Eastern competitor. Canned, the Wenatchee peach must compete with the California product and less favorable freight rates. This it has

thus far not been able to do.

But in the other soft fruits which reach perfection in the Wenatchee country there is no question as to their ability to compete on the markets to which they can be sent, and this includes practically the whole country. It would seem that the growing of cherries, apricots, pears, and plums should be encouraged. This would provide an essential diversification, give a greater seasonal distribution of labor, and bring in money at the season of the year when it is most needed - for the handling of the main crop, - apples. Moreover, profitable returns on these fruits have nearly always been obtained.

Pears have been especially profitable. Fire blight is not feared, scab and other fungous troubles are unknown, and insect pests are of minor importance. A crop of pears can be grown with far less trouble and expense than a crop of apples, and it has been the experience of many growers that pears have yielded consistent profits while apples have not. Pears have a high average yield in the Wenatchee country, 3 to 4 boxes per tree for all varieties and for trees 5 years old and above.

Bartlett is the principal variety grown, and is at present represented by approximately 60,000 trees in this region. Anjou comes second with about 20,000 trees, followed by Comice with 4,000, and Winter Nelis with 3,000. Other varieties are also found in smaller numbers.

The Bartlett follows the California product on the market and is often affected by conditions created by it, but on the average has yielded profitable returns. Of the other varieties

the Anjou appears most likely to be favored. It does very well under Wenatchee conditions and heretofore the supply has never equalled the demand, and prices as high as $2.00 a box have prevailed. An objection to it is that its lateness brings it into conflict with the rush of the apple harvest. However, its qualifications ought to recommend it more favorably than certain varieties of apples.

Stone fruits do well in this region, and the arid climate precludes any danger from fungous troubles which so often make this type of fruit growing unprofitable.

Cherries are represented mainly by four varieties, which, in order of their prominence are; Bing, Royal Ann (the Napoleon of the East), Lambert, and Black Republican. There are in the Valley about 31,000 cherry trees, distributed mainly, however, only a few trees to a ranch, with few cherry orchards of more than an acre.

There is a wide and growing demand for all of the varieties grown here, the black kinds for shipment fresh, and the Royal Ann for canning and the manufacture of "maraschino" cherries. The Bing and Lambert reach perfection in this climate, and their solid meaty texture gives unequalled shipping quality. The large size which they attain under Wenatchee conditions, together with their high dessert quality brings instant favor on the market and profitable returns to the grower. The Black Republican is of smaller size and of poorer quality, but is equally good as a shipper. It does not, however, command as high prices.

The Wenatchee cherry grower is not confronted with much competition, for the sweet cherry industry is confined largely to

the Pacific Coast. In this region Wenatchee is particularily favored because of the absence of rains at ripening time, which elsewhere cause great loss in cracked fruit. Cherries grown in the more humid sections of the Northwest are practically forced onto the canning factory market for the prevalence of fungous rots prevents their shipment to distant markets, and so removes them from competition with Wenatchee. The California cherries are off the market before the wenatchee product arrives. The California varieties are, moreover, mostly inferior in dessert quality, and so should offer no serious competition. The possibilities of development for the sweet cherry trade are as yet unrealized, and perhaps, offer greater opportunities for success than is the case with any other soft fruit.

But to achieve success in cherry production the Wenatchee grower must be prepared to devote greater care in handling and packing than he now does, and must give to the business the serious attention it deserves, instead of the incidental manner in which he now regards it.

It has been proved experimentally that of the four principal varieties grown here, the Bing, Lambert, and Royal Ann are both self-sterile and inter-sterile. This fact is not generally appreciated by cherry growers, but should be taken into consideration in the further commercial development of the industry. Such other varieties as will insure perfect pollination should be introduced, and in this way the present objection of the growers to cherry growing, that is, of yields not being heavy enough, will be overcome.

On certain of the lighter soils the apricot does remarkably

well, altho it thrives in all parts of the valley. But in those sections where it does the best, as at Rock Island, it is one of the most profitable fruits which can be grown. It should be planted more extensively in the effort toward diversification. The market supply of fresh apricots is limited by factors similar to those prevailing in the case of cherries. It seems therefore that Wenatchee, which produces this fruit in such perfection, should accord it more emphasis, and efforts be made to supply and extend the market for this fruit. The bulk of the California crop, which included most of the apricots grown in the United States, is dried or canned, which removes it from competition with Wenatchee. In any event the fresh apricots which California could supply would be off the market before the arrival of the wenatchee product.

The principal variety grown is the Moorpark. It represents fully 75% of the total. Other varieties such as the Royal and the Tilton should be given more prominence to extend the season. The Moorpark is subject to the fault of ripening one side of the fruit before the other, - but properly ripened is of fine quality, large size, and excellent appearance, selling well in the markets. Tilton is superior in dessert quality, is equally productive, and should be more generally grown.

The same remarks accorded to cherries and apricots could, in general, be applied to plums and prunes. What few plantings of these fruits that exist are very productive and profitable. It is a noteworthy fact, however, that aside from the Italian prune there is not a single fine dessert variety grown, and yet all the plums are shipped for the fruit stand and dessert trade. It is

true that the requisite qualities for yield, shipment, and dessert are best combined for this region in the Italian prune, but if so inferior varieties such as the Peach plum, which is at present liberally planted, should be replaced by the Italian. If other varieties are desired for diversification preference should be given those which have proved their merit.

In addition to the soft fruits above discussed, summer apples, especially for markets west of the Mississippi might well be included in efforts toward diversification in the industry. Summer apples are always in good demand, and yield profitable returns, often comparing with the winter varieties to the disadvantage of the latter. Summer apples are out of the way before the last brood of the codling moth can do much damage, and hence fewer precautions and less labor is required in their production than in growing winter apples.

A proper balance only is to be sought between summer fruits and the winter apples, which must continue to be the main reliance of the Wenatchee orchardist. This balance can best be worked out by each individual grower thru attention to the factors involved in his own particular problem. Certain it is that at present the business is overbalanced and handicapped by the emphasis placed on winter apples, and the lack of attention to sources of income in summer fruits.

A consideration of the varieties of apples that are regarded as undesirable, and which should therefore be eliminated might properly involve a discussion of each in detail. However, in this

connection it will not be necessary, for the experience of shippers yields abundant evidence on this point. In certain years all varieties grown in the district have yielded profitable returns, but, considered on the basis of returns thruout all the past seasons, only a few have shown themselves as consistently profitable. Growers are naturally reluctant to remove full-grown trees, especially as they may have occasionally returned a profit, yet such heroic measures as may be involved in the removal of these varieties is essential to future permanent success.

It is the concensus of opinion among shippers that the following varieties are the ones upon which reasonable reliance can be had for consistently profitable returns: Arkansas Black, Delicious, Grimes, Jonathan, Ortley, Rome, Spitzenburg, Winesap, Winter Banana, White Winter Pearmain, Yellow Newtown. No hesitancy should be shown toward expansion in planting any of these varieties, or in grafting over other varieties to these. Delicious and Winesap have proved especially profitable to Wenatchee growers and the former especially might well be much more generally grown.

There appears to be honest difference of opinion as to a few varieties, notably the Aiken Red, Delaware Red, Gano or Black Ben Davis, Mammoth Black Twig, and Stayman. In Southern markets the Delaware Red and the Black Twig find a ready sale. For export to European markets the Aiken Red has good possibilities. Large sizes of Stayman are in demand, but its reputed poor keeping quality is responsible for a loss of favor. It is likely that these varieties grown in limited quantity and in desirable sizes can be handled at

a profit.

For the remainder of the list of varieties grown in the Wenatchee country it must be said that their culture offers no permanent possibility of success, and the sooner they are replaced either with summer fruits or with standard varieties of winter apples, as indicated above, the better it will be for the industry. The standard varieties will produce enough low grade fruit to supply the demand for cheaper grades without competition from undesirable varieties.

The desirability of the elimination of both local and sectional competition of shippers and marketing agencies has already been covered in a previous discussion, but attention may again be directed to the importance of this in any permanent organization of the industry. Upon the final solution of this difficulty probably hinges the future success of the industry. Its solution will call for years of experiment and evolution, and it is not now possible to predict in what direction future action will lie. But growing out of past experience are evolved certain suggestions whose development lies in the natural progress of this phase of Wenatchee's problems.

Natural outlets to consumption must be accepted, and new markets must be developed. This is being done to a degree at present, but it seems that certain markets are being neglected, while others are given too much attention. At present the great bulk of Wenatchee's fruit, apples particularly, is marketed east of the Mississippi and right in the territory covered by the cheaper product of Eastern orchards, where the price level of all Wenatchee fruit is

automatically lowered, while the markets of the Pacific Coast and the Great Plains region are not cultivated as they might be.

The great bulk of the American apples are undoubtedly consumed in the great industrial centers of the East. However, the great bulk of the American apples are produced in close proximity to these centers, and this market very naturally belongs to the Eastern fruit. The more expensive Wenatchee product cannot be expected to compete successfully, and yet, under present conditions, it is endeavored to bring this about. The large percent of questionable and undesirable varieties, and the bulk of the cheaper grade apples of standard varieties naturally finds greatest demand in this class of market, where prime condition and highest quality yield to lower price as a sales inducement. It would seem that this type of apple from Wenatchee, while being curtailed at home by methods before outlined, should, in the future, be largely taken care of in Western markets where it will not meet the competition of the East. There is an enormous expanse of country which does not grow apples, but settled by a prosperous farming population thruout the region west of the Mississippi which should be able to absorb at prices profitable to the grower the greater proportion of this type of apple from the Northwest.

Without competition from this type of Northwestern boxed apple, the extra fancy grades of Wenatchee's standard varieties would meet a ready sale, and be in constantly increasing demand for the fancy trade to which they are best adapted. No extensive Eastern competition in this line need be feared and the limiting factor appears to be centered at home - in the competition of

low grades and small sizes of good varieties, and all grades and all sizes of varieties coming more and more to be recognized as undesirable. Wenatchee has nothing to fear as to its ability to satisfy the fancy trade but it has everything to fear from its ability to confuse that trade with undesirable grades and varieties. It should exclude the fruit which will not maintain its reputation and stimulate a demand for its specialties.

At present there is a tendency to use the Pacific Coast cities as a dumping ground for low grade fruit. Extra fancy apples do not enjoy the sale in this home territory which they could be made to. A demand for apples is not attracted by the class of fruit which is thrown upon these markets. Intelligently cultivated, these cities could be made to offer a constantly increasing demand for the products of the Northwest. This is particularily true in connection with the soft fruits produced in the Wenatchee country. While much of this fruit can be successfully marketed in the East there is a large territory near at hand in the Northwest which is never supplied.

The careful handling and uniform high quality of Wenatchee apples makes them especially desirable for export. Foreign markets are cultivated to some extent at present, but this trade has not been fully developed. In most European countries apples are of limited production and are treated as luxuries, selling at high prices. If the Wenatchee apple can get into these markets with an even chance to compete at prices comparable to those charged for home grown apples its superior condition and finish should give it an advantage which would justify constantly increasing attention to this outlet for a considerable portion of those varieties best

suited for foreign shipment.

Shipments to Australia and South America have already assumed considerable proportions. The alternation of seasons, in this case, is a favorable condition, and brings Wenatchee fruit into the markets of the Antipodes during the time of year when home grown fruit is not to be had. Australia demands small apples - and has not seemed particular about high quality varieties. Most of the fruit heretofore shipped to Australia has consisted of apples 1½ to 2 inches in diameter, showing only a little color, and thinned from the trees during the latter part of August. Many growers have made a practice of doing most of their thinning at this time. The fruit must be perfectly sound in order to pass inspection but immaturity is not considered. If it pays to ship this kind of fruit it would seem that there might be possibilities in sending good quality and first class varieties.

The South American markets differ somewhat from the Australian in demanding large sized fruit, but this qualification is easily met in Wenatchee apples. Brazil, Argentina, and Chili now take small quantities of the Wenatchee output and can doubtless be made to take more if their market demands are intelligently met.

The Orient now takes only a negligible portion of the Wenatchee foreign trade, and indeed imports very few apples. It would seem that in this direction great possibilities could be opened up. However, most of the potential foreign trade cannot immediately be hoped for even if machinery were present for securing it. Shipments to these countries cannot be depended on until after the war and the sea routes are again established.

Sporadic invasion of these markets will not establish the trade. Assurance of a constant supply is a matter of prime importance in obtaining a permanent and stable market. Under the present organization of the marketing agencies no great progress can be expected in the extension of foreign markets. Only a preponderant marketing force, controlling a major percentage of the Northwestern crop, and capable of intelligent, non-competitive distribution, and the extension and protection of markets - only with such an organization can the maximum of efficiency and success in marketing be assured both in the domestic and foreign field.

The Canadian prairie Provinces occupy much the same field in relation to Wenatchee fruit as do the Great Plains area of the United States. The prairie Provinces have long been regarded by the British Columbia and Ontario fruit growers as their own special markets, yet the higher cost of production in the former region, and the remoteness of the latter really gives Wenatchee a chance to enter with them almost on a parity. Tariff barriers have been raised by Canada in an effort to handicap the Northwestern fruit in favor of the Canadian product. But thus far Wenatchee fruit is able to successfully compete, and it is likely that this section of Canada can be made to absorb a constantly increasing amount.

With the development of Alaska a constantly increasing tonnage will be attracted to that market, and always at good prices. But due to climatic conditions early shipments only can be made and attention should be directed to securing for this trade the maximum of quality instead of the high percent of junk which at present is sent.

There remains one other influence which must have an important bearing on the future successful management of the industry - the manufacture of all low grade fruit and present waste into by-products.

The past history of by-products factories in the Northwest is not an encouragement to enter this business. Statistics show that of the cooperative plants that have been established 83% have been entire failures, 10% of the remainder have never yielded a profit worth mentioning but have been carried as a side line by some other activity in which the cooperative organization was engaged. With the organization however, of a dominant marketing force to handle the Northwestern apple, the production of by-products could be put on a sounder basis than has been possible in the past, and could be made to care for a large percent of the apples that at present yield no returns to the growers, and also a large proportion of the soft fruit.

Essential for success with by-products is diversification of fruits handled - one fruit alone cannot be handled successfully. Another equally important consideration is stability of output. By-products cannot be expected to be used for relief one year and their manufacture abandoned in favor of marketing the fruit in a fresh condition the following year. The by-products demand must be cultivated and maintained year after year if permanent success is to be achieved. Unless, therefore, this part of the business is under the control of a dominant organization appreciative of these facts and capable of meeting them there can be no hope for success in this line.

Such then are the problems to be met. That they can be

successfully met is certain, but that they will be speedily solved is not probable. However, it is clear that the horticulture of Wenatchee is a permanent, basic industry, developed out of unrivaled natural advantages. Nature seems to have specially endowed the Wenatchee country for fruit production, and Nature's gift will not be withdrawn. Man, thus far, has not been able to synchronize himself with Nature's efforts, but that he will eventually do so may confidently be expected. The future of Wenatchee's horticultural industry is assured altho the process of evolution may be severe and extended.

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ILLUSTRATIONS

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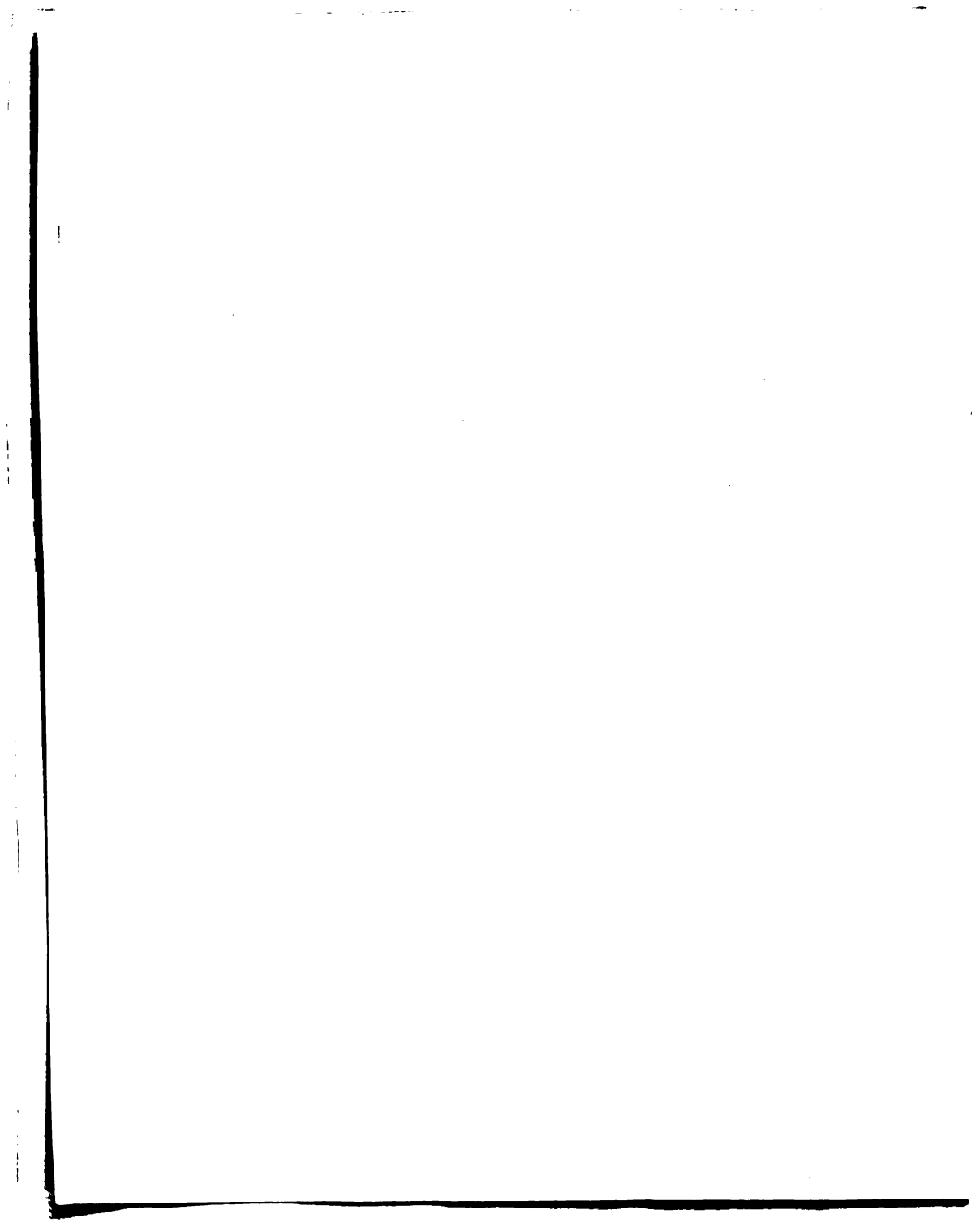


Map showing geographic location of the Wenatchee Country.

Raw land in the Wenatchee country. Covered with sagebrush.

Panoramic view of the Wenatchee district. Left section.

Panoramic view of the Wenatchee district. Center section.

Panoramic view of the Wenatchee district. Right section.

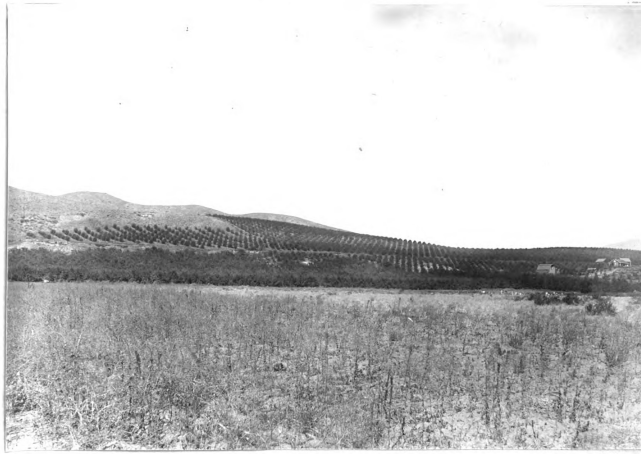
Panoramic view of the Cashmere district. Right section.

Panoramic view of the Cashmere district. Center section.

Panoramic view of the Cashmere district. Left section.

View across the Wenatchee Valley near Monitor, Wash.

View showing the furrow system of irrigation employed in the Wenatchee country.



Orchards located above the High Line Canal at Wenatchee, Wash., and irrigated by pumping.

A four year old Winesap orchard in the Wenatchee country.

A 10-year old Winesap tree at harvest time in the Wenatchee Valley.

Alfalfa cover crop in a young orchard. Trees rows cultivated but later the alfalfa is allowed to cover the entire area.

Heavy irrigation induces a rank growth of vetch cover crops.

Trees planted in exposed locations are much misshapen by the strong winds which blow from the mountains to the west of Wenatchee.

"Thinning out" an Arkansas Black orchard that was planted too close. Illustrates the ill-advised pruning practices which prevail in the Wenatchee country.

State Inspectors cutting out fire blight from an infected Spitzenburg tree in the Wenatchee Valley. Note that opportunity has been left for grafting.

Picking apples in the Wenatchee Valley.

Packing apples in an orchard packing shed, Wenatchee, Wash. In this case the packers are sorting and grading as they pack direct from the orchard boxes of loose fruit.

STATE OF WASHINGTON

Horticultural Laws

OF THE

State of Washington

Chapter 166, Session Laws 1915

OLYMPIA.
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1915

CHAPTER 166.

[H. B. 74.]

AN ACT relating to horticulture and horticultural plants and products and the protection thereof, prescribing certain rules of evidence, requiring certain contracts to be in writing, authorizing the levy and collection of taxes for horticultural purposes, providing for the enforcement of the provisions hereof by writs of mandate and injunction, authorizing counties and municipalities to aid in the enforcement hereof, validating certain expenditures heretofore made for the protection of horticultural interests, providing penalties for violations of this act and methods of collecting the cost of enforcing the same in certain cases, repealing sections 3075, 3079, 3080, 3083 to 3110 inclusive; 3113, 3115, 3116, 3117, 3119, 3120, 3122 to 3127 inclusive; 3131 and 3134 to 3139 inclusive of Remington and Ballinger's Annotated Codes and Statutes of Washington, and declaring this act shall take effect immediately.

Be it enacted by the Legislature of the State of Washington:

SECTION 1. That the term "Commissioner" whenever used in this act shall be held and construed to mean the commissioner of agriculture of the State of Washington, and the term "assistant commissioner" and "assistant" shall be held and construed to mean the assistant commissioner of agriculture for the division of horticulture; the term "horticultural inspector" and the term "inspector" wherever used in this act shall be held and construed to mean an inspector of the department of agriculture, assigned to the division of horticulture; the term "nursery stock" wherever used in this act shall be held and construed to mean and include fruit trees, fruit tree stock, nut trees, grape vines, fruit bushes, rose bushes, rose stock, forest and ornamental trees and shrubs (both deciduous and evergreen), florists' stock, and cuttings, scions and seedlings of fruit or ornamental trees or shrubs, and all other fruit bearing plants and parts thereof and plant products for propagation or planting; the term "infect" and its derivatives "infecting," "infected" and "infection," wherever used in this act shall be held and construed to mean and include being affected by or infested with the dis-

ease or insect pests to which horticultural plants and products are subject and which are required to be guarded against, controlled, cured, removed, and eradicated as in this act provided; the term "disinfect" and its derivatives shall be held and construed to mean and include the cure, removal or eradication of such diseases or pests by cutting and destroying the infected parts, or the application of fungicides or insecticides specified in this act or such other effective solutions or emulsions as may be discovered by science and specified and described in the bulletins issued by the commissioner of agriculture, and the term "person" wherever used in this act, shall be held and construed to mean and include individuals, partnerships, associations, joint stock companies and corporations.

SEC. 2. The commissioner of agriculture shall have the power and it shall be his duty:

(a) To exercise a general supervisory and directory control over the horticultural interests of the state:

(b) To arrange for and hold meetings for the discussion and dissemination of information as to horticultural subjects and for the demonstration of methods of preventing diseases of and pests injurious to horticultural plants, fruits and vegetables, and of curing and removing the same:

(c) To publish and distribute circulars and reports upon horticultural subjects, the pests affecting and the diseases of fruit trees, vines or bushes, ornamental trees or shrubbery, horticultural plants, fruits, vegetables and nursery stock, and the means and methods of controlling, curing, removing, eradicating and disinfecting for such diseases and pests:

(d) To issue licenses to nurserymen and dealers in nursery stock and their agents, salesmen and solicitors and revoke the same for violations of or failure to comply with this act, and to keep in his office a record of all licenses issued, showing the character of the license, name and address of the holder, the date of issue and the date of expiration or revocation:

(e) To furnish to the board of county commissioners of each county, annually, on or before September 1, an estimate of the expenses for the ensuing year of inspecting and disinfecting orchards, vineyard, berry farms, vegetable farms and nurseries, and packing houses, warehouses, store-rooms, depots, docks and other places where fruits, vegetables or nursery stock are grown, packed, stored, shipped or held for shipment or delivery or offered for sale within said county;

(f) To appoint inspectors to enforce and carry out the provisions of this act, which inspectors may be of two classes, inspectors at large and local inspectors: *Provided*, That not more than twenty inspectors at large shall be appointed.

(g) The commissioner may also in his discretion appoint any officer or member of any local fruit protective association to act as inspector, vested with power only to enter premises and inspect orchards and report to the inspector-at-large. Such inspectors shall receive no compensation for services and shall not be required to take the regular examination required of inspectors-at-large and local inspectors.

(h) To make, adopt, issue and publish from time to time and enforce general rules and regulations governing the grading and packing of apples, and other fruits.

The commissioner of agriculture, and under his direction and control the assistant commissioner and the horticultural inspectors, shall have the power and it shall be their duty:

(a) To enforce the provisions of this act and all laws relating to horticultural interests:

(b) To inspect orchards, vineyards, berry farms, vegetable farms, nurseries, fruit trees, vines or bushes, ornamental trees or shrubbery, horticultural plants, fruits, vegetables, nursery stock and horticultural supplies, and packing houses, dry houses, warehouses, store-rooms, depots, docks, cars, vessels and other places where fruits, vegetables or nursery stock are packed, stored, shipped or held for shipment or delivery or offered for sale, and other

property liable to be infected with any disease or pest injurious to horticulture, and to require the disinfection of all such property and premises found to be infected and for that purpose shall have free access to such property and premises at all times.

(c) To inspect and examine orchards, vineyards, nurseries, berry farms, vegetable farms, fruits, vegetables, nursery stock and all other horticultural plants and products, at the request of the owner thereof for the purpose of discovering the existence of any disease or pest, and to report to the applicant the result of such investigation and prescribe proper remedies;

(d) To disinfect orchards, vineyards, berry farms, nurseries, fruit trees, vines and bushes, ornamental trees and shrubbery, horticultural plants, fruits, vegetables and nursery stock, and packing houses, dry houses, warehouses, store-rooms, depots, docks, cars, vessels and other places where nursery stock, fruits or vegetables are packed, stored or shipped or held for shipment or delivery or offered for sale, in case the owner or person having the same in charge shall neglect or refuse so to do, after notice; and in case any infected fruit trees, vines or bushes, ornamental trees or shrubbery, horticultural plants, fruits, vegetables or nursery stock cannot be successfully disinfected to condemn and destroy the same or cause the same to be destroyed;

(e) To require all partially infected fruit, vegetable and nursery stock shipments to be sorted and repacked and, in case the owner or person having charge of the same shall neglect or refuse so to do after notice, to condemn and destroy the same;

(f) To issue certificates of inspection to licensed nurserymen and dealers in nursery stock, on stock inspected and approved.

SEC. 3. Inspectors-at-large may be assigned to duty in one or more counties and transferred from one county to another in the discretion of the commissioner, and their salaries, compensation and actual and necessary traveling

expenses shall be paid by warrants drawn upon the state treasurer by the state auditor upon vouchers signed and verified under oath by such inspectors and countersigned by the commissioner or the assistant commissioner. In addition to inspectors-at-large the commissioner shall, whenever the board of county commissioners of any county by resolution request it, appoint such number of local inspectors and for such length of time as such resolution shall specify and assign them to duty in such county. The salaries, not to exceed four dollars per day, and actual and necessary traveling expenses, within the county, of all local inspectors shall be paid out of the current expense fund of their respective counties upon vouchers signed and verified under oath by such inspectors and approved by the commissioner or the assistant commissioner, and the county auditor shall issue warrants therefor upon the said county fund. All local inspectors shall be under the direction and control of the commissioner of agriculture and the assistant commisisoner. In case any inspector is dismissed from the service or transferred to another place, or to other duties, any qualified inspector or officer of the agricultural department may continue or complete any work or perform any duty initiated by such dismissed or transferred officer.

SEC. 4. It shall be the duty of every person owning, leasing or occupying any land or premises on which there is or shall be growing, grown or situate any nursery stock, fruit trees, vines or bushes, shade trees, ornamental trees or shrubbery, or any horticultural plants, and of the owner or lessee of any such nursery stock, trees, fruit trees, vines, bushes, shrubbery or plants growing or situate on premises leased or occupied by him, and of the owner of any such nursery stock, trees, fruit trees, vines, bushes, shrubbery or plants growing, situate or being at any place within the State of Washington, for sale or delivery, and of every grower, shipper, commission merchant, consignee, dealer in and person in charge of any nursery stock, fruit or vegetables about to be shipped, or shipped, or held for

delivery or offered for sale, to take and use sufficient methods and means for the prevention of infection by all pests and diseases to which such nursery stock, trees, fruit trees, vines, bushes, shrubbery, plants, fruits or vegetables may be subject, and to keep the same free from disease and pests, and, in event it is found that any such nursery stock, trees, fruit trees, vines, bushes, shrubbery, plants, fruits or vegetables are infected with any disease or pest, to promptly take and use effective means to control, cure, remove, eradicate and disinfect for the same, and in case such nursery stock, trees, fruit trees, vines, bushes, shrubbery, plants, fruits or vegetables cannot be successfully disinfected, to promptly destroy the same, and it shall be the duty of every owner and of the lessee of any premises upon which there are growing any infected fruit, fruit trees, shade or ornamental trees, vines or bushes, to thoroughly spray the same with a proper solution or emulsion or otherwise disinfect the same for the control, cure or removal of such infection.

SEC. 5. The pests injurious to and diseases of nursery stock, fruit trees, shade trees, ornamental trees and shrubbery, horticultural plants, fruit and vegetables to be guarded against, controlled, treated, removed, eradicated and disinfected for, as in the next preceding section provided, shall be all bacterial diseases, including fire blight of apple, pear and quince, crown gall or root gall, and hairy root; all fungus diseases, including black spot canker, pear scab, apple scab, apple powdery mildew, peach leaf curl, peach mildew, brown rot of peach, cherry and prune, chestnut blight, potato wart, powdery scab of potato and peach twig blight; all insect pests, including chewing insects, such as bud moth, peach twig borer, caterpillars, pear slug, flat-headed borer, round-headed borer, imported cabbage worm, potato tuber moth, potato nematode or eel worm, Mediterranean fruit fly, lesser apple worm, tussock moth, gypsy moth, brown tail moth, coddling moth, and the larva of any thereof, and sucking insects, such as San Jose scale, scurfy scale, oyster shell

bark louse, aphids, pear leaf blistermites and red spider; and such other bacterial and fungus diseases and insect pests as may be identified by science and specified and described as injurious to horticulture in the circulars to be issued from time to time by the commissioner of agriculture.

The methods and means required to be used for the prevention, control, removal, eradication and cure of the diseases and pests above specified, shall be as follows: For bacterial diseases, eradication by the removal and destruction of the infected plant or part thereof, care being taken to disinfect all tools used in such removal to prevent the spread of the infection or by any other methods that shall have been approved by the insecticide and fungicide board; for fungus diseases, control or cure by spraying with effective fungicides, such as bordeaux solution, lime-sulphur solution, sulphide of iron or other effective fungicides; for chewing insect pests, control or removal by spraying with effective insecticides, such as arsenate of lead solution and arsenite or zinc solution; for sucking insect pests, control or removal by spraying with effective insecticides such as lime-sulphur solution, crude oil emulsion, tobacco solution, distillate oil emulsion, kerosene emulsion, soap solution, and sulphur solution, or combinations thereof; and for fungus and insect pests, control, cure or removal by spraying with such other effective solutions and emulsions as may be discovered by science and specified and described in the circulars issued by the commissioner of agriculture.

SEC. 6. There is hereby created a board to be known as the state insecticide and fungicide board, which board shall consist of the commissioner of agriculture or the assistant commissioner, the director of the agricultural experiment station at Pullman and three members of the agricultural experiment station to be appointed by the director, one of whom shall be an entomologist, one a plant pathologist and one a chemist. It shall be the duty of the said board to analyze and report upon any insecticides and fungicides offered for sale to be used in the control and re-

moval of insect pests and fungus and bacterial diseases to which horticultural plants are subject. It shall be the duty of all horticultural inspectors to from time to time procure and submit to such board samples of such insecticides and fungicides offered for sale.

SEC. 7. It shall be unlawful for any person to offer for sale in the State of Washington any horticultural insecticide or fungicide which is adulterated or misbranded within the meaning of this act. The term "insecticide" as used in this act shall include any substance or mixture of substances intended to be used for preventing, destroying, repelling, or mitigating any insects which may infest vegetation. The term "Paris green" as used in this act shall include the product sold in commerce as Paris green and chemically known as the aceto-arsenite of copper. The term "lead arsenate" as used in this act shall include the product or products sold in commerce as lead arsenate and consisting chemically of products derived from arsenic acid (H_3AsO_4) by replacing one or more hydrogen atoms by lead. That the term "fungicide" as used in this act shall include any substance or mixture of substances intended to be used for preventing, destroying, repelling, or mitigating any and all fungi that may infest vegetation or be present in any environment whatsoever.

SEC. 8. That for the purpose of this act an article shall be deemed to be adulterated—

In the case of Paris green: First, if it does not contain at least fifty per centum of arsenious oxide; second, if it contains arsenic in water-soluble form equivalent to more than three and one-half per centum of arsenious oxide; third, if any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

In the case of lead arsenate: First, if it contains more than fifty per centum of water; second, if it contains total arsenic equivalent to less than twelve and one-half per centum of arsenic oxid (As_2O_5); third, if it contains arsenic in water-soluble form equivalent to more than seven-

ty-five one hundredths per centum or arsenic oxid (As_2O_5); fourth, if any substances have been mixed and packed with it so as to reduce, lower, or injuriously affect its quality or strength: *Provided, however,* That extra water may be added to lead arsenate (as described in this paragraph) if the resulting mixture is labeled lead arsenate and water, the percentage of extra water being plainly and correctly stated on the label.

In the case of insecticides or fungicides, other than Paris green and lead arsenate: First, if its strength or purity fall below the professed standard or quality under which it is sold; second, if any substance has been substituted wholly or in part for the article; third, if any valuable constituent of the article has been wholly or in part abstracted; fourth, if it is intended for use on vegetation and shall contain any substance or substances which, although preventing, destroying, repelling, or mitigating insects, shall be injurious to such vegetation when used.

That the term "misbranded" as used herein shall apply to all insecticides, Paris green, lead arsenates, or fungicides, or articles which enter into the composition of insecticides or fungicides, the package or label of which shall bear any statement, design, or device regarding such article or the ingredients or substances contained therein which shall be false or misleading in any particular, and to all insecticides, Paris greens, lead arsenates, or fungicides which are falsely branded as to the state, territory, or country in which they are manufactured or produced.

That for the purpose of this act an article shall be deemed to be misbranded—

In the case of insecticides, Paris greens, lead arsenates, and fungicides: First, if it be an imitation or offered for sale under the name of another article; second, if it be labeled or branded so as to deceive or mislead the purchaser, or if the contents of the package as originally put up shall have been removed in whole or in part and other contents shall have been placed in such package; third, if in pack-

age form, and the contents are stated in terms of weight or measure, they are not plainly and correctly stated on the outside of the package.

In the case of insecticides (other than Paris greens and lead arsenates) and fungicides: First, if it contains arsenic in any of its combinations or in the elemental form and the total amount or arsenic present (expressed as per centum of metallic arsenic) is not stated on the label; second, if it contains arsenic in any of its combinations or in the elemental form and the amount of arsenic in water-soluble forms (expressed as per centum of metallic arsenic) is not stated on the label; third, if it consists partially or completely of an inert substance or substances which do not prevent, destroy, repel, or mitigate insects or fungi and does not have the names and percentage amounts of each and every one of such inert ingredients plainly and correctly stated on the label: *Provided, however,* That in lieu of naming and stating the percentage amount of each and every inert ingredient the producer may at his discretion state plainly upon the label the correct names and percentage amounts of each and every ingredient of the insecticide or fungicide having insecticidal or fungicidal properties, and make no mention of the inert ingredents, except in so far as to state the total percentage of inert ingredients present.

SEC. 9. The commissioner of agriculture, the assistant commissioner and all horticultural inspectors are authorized and empowered to at any time enter upon any premises where any nursery, orchard, vineyard, berry farm or vegetable farm is situate or whereon any nursery stock, fruit trees, shade trees, ornamental trees or shrubbery or horticultural plants are growing, or upon any premises or into any building, packing house, dry house, warehouses, store-room, depot, dock, car, vessel, or other place wherein any nursery stock, fruits, vegetables, or horticultural products are situate, being prepared or packed for shipment, stored, shipped, held for shipment or for delivery upon any shipment or sale, or offered for sale for the pur-

pose of examining and inspecting such premises or property to ascertain whether the same or any thereof are infected, and it shall be unlawful for any person to hinder or prevent or to attempt to hinder or prevent any such officer from entering such premises or inspecting such premises or property or performing any duty required by this act.

SEC. 10. In case the officer making the inspection provided for in the preceding section shall find that the premises or property inspected is infected, he shall condemn the same and serve upon the owner or upon the person having possession or charge of said premises or of said property a notice in writing that the same is condemned and ordering the disinfection of any and all thereof which is capable of disinfection and the destruction of such property as is incapable of disinfection, which notice shall describe the premises or property ordered to be disinfected or destroyed with reasonable certainty and shall specify the time within which the same shall be so disinfected or destroyed; and shall give notice that unless the premises or property ordered disinfected or destroyed is disinfected or destroyed as directed, in the manner and within the time specified in said notice, the same will be done by the officer giving the notice and the expense thereof charged against the premises and the owner of said premises or property. In case said premises or property is in the possession or charge of any person upon whom service can be made, the officer making the inspection shall serve a copy of such notice upon such person and, in case the premises or property is in possession or charge of any other person than the owner thereof, or service cannot be had upon any person in possession or charge thereof, the officer shall serve said notice upon the owner of said premises or property by mailing or telegraphing him a copy thereof, if his name or postoffice address are known to the officer or can with reasonable diligence be ascertained. In case personal service of said notice cannot be had upon any person in possession or charge of said premises or property and the

name and address of the owner of such premises or property are not known and cannot with reasonable diligence be ascertained, said notice shall be served by posting the same in a conspicuous place upon the premises where the property to be disinfected or destroyed is situated, as the case may be. In case the name and postoffice address of the owner are not known and cannot with reasonable diligence be ascertained and in the absence of fraud and gross neglect, service of such notice upon the person in possession or charge of said premises or property shall be construed to be substituted personal service upon the owner, and, in case service of such notice upon a person in possession or charge of such premises or property cannot be had and the name and post office address of the owner is not known and cannot with reasonable diligence be ascertained and in the absence of fraud and gross neglect, such posting of the notice upon the premises shall be construed to be constructive personal service upon the owner of such premises or property. Upon the giving of such notice as hereinabove provided it shall become and be the duty of the owner and person having possession or charge of the premises or property described in the notice to, within the time specified in said notice, disinfect said premises or disinfect or destroy said property, as the case may be: *Provided*, That in the case of nursery stock, fruit or vegetables about to be shipped or any shipment thereof, or which is offered for sale, or held for the purpose of delivery upon any shipment or sale thereof, if the officer making the inspection shall find that only a part thereof is so affected that it cannot be successfully disinfected, he shall state in such notice that the owner or person in charge thereof has the privilege of separating the same into two or more of the following classes, to-wit, such as does not need disinfection, such as can be successfully disinfected, and such as cannot be successfully disinfected, and in such cases it shall be the duty of the owner and person in charge of such property to, within the time specified in said notice, disinfect such nursery stock, fruit or vegetables as can be successfully

disinfected and destroy such as cannot be successfully disinfected: *And provided, further*, That in the case of fruit or vegetables that cannot be successfully disinfected the inspector may grant the owner or person in charge thereof the privilege of manufacturing the same into by-products or of shipping the same to a by-product factory and issue a permit in writing so to do, and in such case it shall be unlawful for the person receiving such permit to sell or dispose of such infected fruit without having first manufactured the same into a by-product or shipped the same to a by-product factory, or to divert any such shipment when made, and it shall be unlawful for the consignee of any fruit or vegetables shipped to a by-product factory, to sell or dispose of the same without first manufacturing it into a by-product. It shall be unlawful for any person to ship, deliver, sell, barter, give away or otherwise dispose of or part with the possession of any nursery stock, fruit or vegetable which has been found infected and condemned until all of the requirements of said notice and order have been complied with, and permission given in writing so to do by an inspector.

SEC. 11. In case the owner or person in charge of any premises or property required to be disinfected or destroyed as in the previous section provided, shall fail or neglect to comply with the notice within the time specified therein, the officer giving the notice shall have the right and it shall be his duty to enter upon the premises to be disinfected or where the personal property required to be disinfected or destroyed is situated and perform the acts required in such notice, or cause the same to be performed at the cost and expense of the owner of such premises or property as the case may be. The officer shall keep an accurate account of such cost and expense and the same shall be a lien upon the premises or personal property so disinfected, which lien may be enforced by the methods hereinafter provided. The liens in this section provided for shall in the case of personal property have precedence over all other liens.

SEC. 12. The officer disinfecting any personal property may, in case the owner or person in charge shall not pay such cost and expense, impound and sell such property to enforce the lien of the state and collect such cost and expense. The officer impounding personal property as above provided shall give notice in writing that the property is impounded which notice shall describe the property with reasonable certainty, state where the same is impounded, specify the amount of costs and expenses charged against it and state that unless the charges are paid within a time specified in said notice the property will be sold to satisfy the charges against it and the transportation and storage charges accrued, if any, and the cost of making the sale. The officer giving such notice shall post it in a conspicuous place upon the premises where such property is impounded and serve the same upon the owner or upon the person in possession or charge of such impounded property in like manner with like effect as hereinabove in this act provided for service of notice to disinfect. The time within which a sale shall be had after the giving of the notice shall not be less than ten days: *Provided*, That in the case of perishable fruits or vegetables, the same may be had immediately. Sales may be either at public auction or private sale as in the sound discretion of the officer may be for the best interest of the state and the owner of the property to be sold. The proceeds of any such sale shall be applied first to the payment of the cost of making the sale, second to the payment of the cost and expense of disinfection and third to the payment of accrued transportation and storage charges, if any, and the balance, if any, shall be paid the owner or person in charge of the property sold, upon demand. In case the proceeds of such sale be not sufficient to pay the cost of making the sale, and the cost and expense of disinfection, the deficiency may be recovered from the owner of the property disinfected in an action at law in the name of the state on the relation of the commissioner of agriculture, and the prosecuting attorney of the county where the property was disinfected shall,

when directed so to do by the attorney general, bring such action for the recovery of such deficiency. The officer making such sale shall make and keep a full and detailed record of all acts done by him with reference to such property, stating the name of the owner or reputed owner of such property when known, the location thereof, the date of inspection, the facts found upon inspection, the date and manner of giving the notice to disinfect, the failure of the owner or person in charge to disinfect, the disinfection by or under the direction of the officer, the cost and expense thereof in detail, the date and manner of giving the notice of impounding and sale, the date, place and manner of sale, the name of the person to whom the property was sold, the amount of the proceeds of the same and the disposition made thereof, which record shall be signed by the officer making the same. Upon demand of the owner or person in charge of such property, the officer making the sale shall furnish him with a copy of such record verified under oath, and shall tender him the balance of said proceeds. If no demand is made upon the officer making such sale within thirty days from the date of sale, or in case the balance of said proceeds is not accepted when tendered, the officer shall file a verified copy of such record with and remit the balance of the proceeds of such sale to the commissioner of agriculture, who shall retain the same for a period of six months subject to the order of the owner of the property sold, and if at the end of six months such proceeds be not claimed and accepted by the owner or his order, the same shall be turned into the state treasury. The record required to be kept as hereinabove provided and the verified copy thereof shall be *prima facie* proof of the truth of the facts therein stated in any court in any action or proceeding where proof of such facts is competent.

SEC. 13. It shall be the duty of the board of county commissioners of each county at the time of making the regular annual tax levy in each year to include a tax upon the taxable property of such county in such an

amount as they shall find will produce funds sufficient to meet the expense of inspecting and disinfecting orchards, vineyards, berry farms, vegetable farms, nurseries, fruit trees, vines or bushes, ornamental trees or shrubbery, horticultural plants, and packing houses, warehouses, dry houses, store-rooms, depots, docks and other places where fruits, vegetables or nursery stock are packed, stored, shipped or held for shipment or delivery or offered for sale within said county, which shall be inspected or disinfected by or under the direction of an inspector, which tax shall be known as the "horticultural tax." In estimating the amount to be levied for such horticultural tax, the county commissioners shall take into consideration the expense of inspecting and disinfecting the above mentioned property within said county for the ensuing year and the amount that will be collected from levies on property disinfected as in this act provided. The horticultural tax shall be levied and collected in the same manner as other general taxes and when collected shall be placed in the current expense fund of said county. Until the collection by any county of the taxes to be levied under the provisions of this section at the next annual tax levy after the taking effect of this act, the county commissioners of such county are authorized and empowered to cause to be paid, by warrants drawn upon the current expense fund of such county, all expenses for inspecting and disinfecting premises or property within said county properly chargeable to such county under the provisions of this act, and all expenditures made from and warrants drawn upon the current expense fund of any county by order of the board of county commissioners of such county, subsequent to the repeal of section 3133 of Remington and Ballinger's Annotated Codes and Statutes of Washington and prior to the passage of this act for the purpose of paying the cost and expense of inspecting or disinfecting premises or property in such county as provided in this act, are hereby validated.

SEC. 14. The cost and expense of disinfecting any nursery, orchard, berry farm, vineyard or vegetable farm,

or any nursery stock, fruit trees, vines or bushes, shade trees, ornamental trees or shrubbery or horticultural plants growing on any premises, or any packing houses, warehouse, dry houses, store-rooms, depots, or other premises where nursery stock, fruits, vegetables or horticultural products are stored, situated or being prepared or packed for shipment or offered for sale or held for the purpose of delivery upon any shipment or sale, may be recovered as in this section provided. The officer disinfecting any premises or property growing upon any premises or causing the same to be disinfected as in this act provided shall make and keep a full and detailed record of all acts done by him with reference to such property or premises, stating the legal description of premises upon which property disinfected was growing, the name of the owner or reputed owner, the date of inspection, the facts found upon inspection, the date and manner of giving of notice to disinfect, the failure of the owner or person in charge to disinfect, the disinfection by or under the direction of the officer, the cost and expense thereof in detail, which record shall be signed by the officer making the same. In case the cost and expense of disinfecting any premises, or the property growing thereon, are not paid within five days after the completion of the work of disinfecting, the officer making such record shall make and file with the county auditor of the county where such premises are situated two verified copies of the record of his acts with reference to said premises and the charge against the same, and shall also file a claim of lien against said premises for the amount of such charges and expenses, which said claim shall refer to said record. Upon the filing of such verified record and claim of lien the county auditor shall record the said claim of lien as other lien claims are recorded. The county auditor shall also, at the time when said record and claim are filed, forthwith issue proper warrants in payment for labor of men employed in the work and fix a day for a hearing upon the report before the board of county commissioners, which date shall not

be less than twenty days from the date of said filing and shall prepare a notice of the filing of such record and claim and of the date of hearing upon the same and in all proceedings the county shall be deemed substituted to all the rights of laborers paid as herein provided. Said notice shall be directed to the owner, or reputed owner, and shall give notice of the filing of said record and claim and of the amount thereof and shall also give notice of the time and place when and where the board of county commissioners will hear and determine the same. The county auditor shall deliver said notice, together with a copy thereof, to the sheriff of the county in which said claim is filed and the sheriff shall make service thereof in like manner and with like effect as herein provided for the service of notice to disinfect and shall make return of such service upon the original notice and file the same with the county auditor before the time of hearing of the same, and he shall also certify with said return the amount of his fees for such service, which shall be the same as is provided for service of summons in civil proceedings. In case the amount of said claim, together with the amount of sheriff's fees and auditor's fees, which shall be the same as is charged for the filing and recording of other liens, is paid to the county treasurer on or before the date of said hearing before said board of county commissioners, the auditor shall, upon the presentation to him of a duplicate receipt of said treasurer for the amount above specified, cancel the said lien in the records of his office and notify the board of county commissioners of his action in the premises. The county treasurer shall disburse the fund received by him as above provided to the parties entitled to receive the same according to the record as shown in the office of the county auditor. In case the amount of said claim, together with costs as above provided, is not paid at or before the time of the hearing before the board of county commissioners, the county auditor shall present a verified copy of said claim and record to the said board, which shall proceed with the hearing upon the same and shall, if offered, hear sworn testimony con-

cerning the matter set forth in said record and claim. The record required to be kept by the officer disinfecting, as hereinabove provided, and the verified copy thereof filed with the county auditor, shall be *prima facie* proof of the facts therein stated in any proceedings before the board of county commissioners and in any court in any action or proceeding where proof of such facts is competent or the validity of such charges or any tax levied therefor is questioned. After the hearing as herein provided for, the county commissioners shall make an order fixing the amount of such claim and costs and shall order the amount so fixed paid out of the current expense fund of said county, and the auditor shall draw warrants for the payment of such claim as fixed by the county commissioners. The said order of said board fixing the amount of said claim and costs shall be recorded by the county auditor as are other lien claims and shall stand as a lien in favor of said county against the premises therein described until cancelled as herein provided. In case the amount of said lien, together with interest thereon at the rate of six per cent per annum from the date of said order of said board of county commissioners, is paid to the county treasurer of said county on or before the first Monday in October following the date of said order and a duplicate receipt therefor of said treasurer is presented to said county auditor, the county auditor shall cancel said claim of lien in the records of his office. Payment to the county treasurer as above set forth shall be made by presenting to said treasurer a statement over the signature of the county auditor of the amount due upon said claim together with the amount of money shown by said statement to be due. Upon said payment being so made the treasurer shall stamp said statement as paid, showing the date of said payment, and shall file said statement so stamped in the records of his office; he shall also issue a duplicate receipt for said payment and shall deliver one of said receipts to the party making payment and immediately transmit one of said receipts to the county auditor. In case the amount of said claim and

costs, together with interest at the rate of six per cent. per annum from the date of said order of said board of county commissioners, is not paid as hereinabove provided, on or before the first Monday in October following the date of said order, the board of county commissioners shall, at the regular meeting for the levy of taxes in the month of October following the date of said order, make an order that the amount of such claim, costs and interest, together with a penalty of six per cent. thereon, shall be a tax on the premises described in said claim and collected as other taxes are collected and said last named amount shall be added to the amount of taxes levied against said premises for current expenses. Upon the making of said order the county auditor shall mark the recorded order of said board fixing the amount of said claim of lien "cancelled and amount hereof charged as taxes against the property." Upon the collection of said tax by the county treasurer the same shall be credited to the current expense fund of the county.

SEC. 15. It shall be unlawful for any person to import into this state, sell, barter, or otherwise dispose of or offer for sale or have in his possession for the purpose of sale or barter any fruit which is or has been infected with peach mildew, peach twig borer, San Jose scale or other insect pests or the larvae of the codling moth or peach twig borer, and the fact that any fruit bears the mark of any such scale insect or is worm eaten by any such larvae, shall be conclusive evidence that the fruit is infected, within the meaning of this section: *Provided*, That nothing in this section shall be construed to prevent the grower of such infected fruit grown within the State of Washington from manufacturing the same into a by-product or selling and shipping the same to a by-product factory.

SEC. 16. It shall be the duty of every person growing or packing and selling, offering for sale or shipping in closed boxes or packages, any fruit grown in this state, to plainly mark the same on the outside of the box or package with the name of the variety contained therein or with the

words "variety unknown," the name of the place or locality where grown and the name of the grower, or, in case of sale or shipment through an association or organization of growers, the name of such association and the lot number of the grower, and, in case of apples, pears or peaches, the net weight or the number contained in the package, and it shall be unlawful for any person to mark, or place upon, any such package the name of any other place or locality than the place where such fruit was grown, except the place to which shipped, or to falsely mark any such package as to variety, name of grower, association or organization, or place where grown, or to obliterate or change the original marks on any such package or to re-mark the same with the name of any other grower or of any other place than that by or in which the contents were grown, or in case such package is marked with the name of an association or organization of growers to re-mark the same with the name of any other association or organization, and it shall be unlawful for any person having in his possession for sale or offering for sale or selling any fruit grown in this state and shipped in closed packages, to repack the same in the boxes or packages of any other grower or shipper or from any other place, or to sell or offer for sale in closed packages any such fruit except in the original packages, or to pack in or offer for sale from any marked box or package any fruit other than that originally contained or shipped therein. In addition to the marks required to be placed upon any closed package of fruit grown in this state, as hereinabove provided, the grower thereof or association or organization of growers packing the same, may mark upon the outside of such package the grade of the fruit contained therein either as "First Grade," "Grade No. 1," or "Extra Fancy," "Second Grade," "Grade No. 2," or "Fancy," "Third Grade," "Grade No. 3," or "C Grade," or such other designation as will indicate first, second or third quality of fruit and "Washington Standard Pack" and it shall be unlawful for any person to re-mark any such closed

package as a higher or superior grade than that originally marked by the grower thereof or association or organization packing the same, or for any person other than the grower or association or organization packing such fruit grown in this state to place upon any such closed package not marked with the grade of the contents thereof any mark or brand indicating the grade of such contents. *Provided* that nothing in this section shall be construed to apply to canned or dried fruit.

SEC. 17. It shall be unlawful for any grower thereof or association or organization of growers packing apples to mark the package with the grade of the contents unless such contents shall comply with the general rules and regulations made, adopted, issued and published from time to time by the commissioner of agriculture, which general rules and regulations shall define and establish the standard for (1) "First Grade," "Grade No. 1," or "Extra Fancy," (2) "Second Grade," "Grade No. 2," or "Fancy," (3) "Third Grade," "Grade No. 3," or "C Grade," and (4) "Orchard Run," which general rules and regulations shall be adopted, issued and published within thirty days after the taking effect of this act and the commissioner of agriculture is authorized and directed to in the month of December of each year make, adopt, issue and publish general rules and regulations governing the packing of apples and establishing and defining the grades thereof for the ensuing calendar year and in adopting the same the commissioner is authorized to consult and advise with fruit growers, the officers of associations or organizations of apple growers or distributors or dealers in apples. Before making the rules and regulations for which provision is made in this section the commissioner of agriculture shall provide for a public hearing of horticulturists thereon, notice of which shall be given by mail to every horticultural society, growers' association or marketing organization which shall have filed with him a notice of its existence thirty days before the date of any such hearing, and which shall be a resident of the State of

Washington. For the conducting of such hearing the commissioner of agriculture may prescribe all necessary reasonable rules, but said rules must be such as to insure a fair, full and impartial opportunity for all interested districts to be heard. In establishing the grading rules herein mentioned the commissioner of agriculture shall base them on the necessities and proprieties as shown at said hearing, taking into consideration the tonnage of commercial fruit in each district of the state affected by the grading rules to be established.

SEC. 18. It shall be the duty of every person within forty-eight hours after removing any cuttings or prunings from bacterially infected trees or plants to destroy or disinfect the same by burning or scorching.

SEC. 19. It shall be the duty of the proper state officials, of the board of county commissioners of each county, of the mayor and council or other governing officials of each city and town and of the officers of each irrigation district and school district to, in compliance with the provisions of this act, cause the disinfecting of all infected trees and shrubbery growing upon the public highways, grounds, canals or other public property of such state, county, city, town or district, and such county commissioners and municipal officers are hereby authorized to expend the funds of such county or municipal corporation in carrying out the provisions of this section, and in case of the failure or neglect of any of the aforesaid officers to comply with this section, compliance therewith may be compelled by writ of mandate sued out in a superior court of competent jurisdiction in an action begun in the name of the state upon the relation of the commissioner of agriculture.

SEC. 20. It shall be unlawful for any person, firm or corporation to engage in, conduct or carry on the business of selling, dealing in or importing into this state for sale or distribution, any nursery stock, or to act as agent, salesman or solicitor for any nurseryman or dealer in nursery stock or to solicit orders for the purchase of nursery stock, without first having obtained from the

commissioner of agriculture and having in force a license so to do, and it shall be unlawful for any person to falsely represent that he is the agent, salesman, solicitor or representative of any nurseryman or dealer in nursery stock. No license shall issue until the applicant therefor shall have paid the fee and furnished the bond, as in this act required. The license fee shall be five dollars for nurserymen and dealers in nursery stock and one dollar for agents, salesmen and solicitors. All licenses shall be in the name of the person, firm or corporation licensed, and shall show the purpose for which issued, the name and location of the nursery or place of business of the nurseryman or dealer licensed or represented by the agent, salesman or solicitor licensed, and no license shall be issued to any agent, salesman or solicitor unless the nurseryman or dealer represented shall be licensed. All licenses shall bear the date of issue and shall expire on the first day of July next following the date of issue: *Provided*, That all licenses in force at the time of the taking effect of this act shall continue in force during the term for which they were issued, unless sooner revoked, and any holder of such license applying for a license under this act prior to the first day of July next following the expiration of his former license, shall be required to pay therefor only the proportional part of the fee required for an annual license for the remaining portion of the year until the first day of July next following.

SEC. 21. Every nurseryman or dealer in nursery stock, applying for a license under this act shall make, execute and file with the commissioner of agriculture a bond running to the State of Washington, in the sum of one thousand dollars with surety or sureties to be approved by the commissioner, conditioned for the faithful compliance by the applicant with all of the provisions of this act and the laws of the State of Washington relating to the sale, disposition, delivery, inspection and disinfection of nursery stock grown, dealt in, imported, sold, handled or delivered by him during the term of the license applied for and the

term or terms of any renewal of the same, and conditioned further that all nursery stock sold or delivered by him during said term or terms shall be true to name, age, and variety as represented, and free from the diseases and pests required to be guarded against by this act.

Every licensed nurseryman or dealer in nursery stock who shall have complied with the provisions of this section shall be entitled, upon the expiration of his license or any renewal thereof, by the payment of the fee of five dollars on or before the date of the expiration of his license or any renewal thereof, to have his license renewed for the ensuing year ending July 1st, by the giving of a bond as herein specified.

The cancellation or revocation of, or the withdrawal of the sureties from, any bond filed in accordance with the provisions of this section, shall *ipso facto* work a suspension of the license of the principal of said bond and the license of all agents, salesmen and solicitors employed by and representing him, until such time as such principal shall furnish a new bond to be approved by the commissioner of agriculture.

SEC. 22. Upon complaint in writing, verified under oath by the complainant, being made to the commissioner of agriculture, that the holder of any license in this act provided for has violated or failed to comply with the provisions of this act or the laws of the State of Washington relating to horticulture, the commissioner, if in his judgment the complaint justifies a hearing thereon, shall serve upon the holder of such license by registered mail, a copy of such complaint and a notice of the time and place of hearing the same, which hearing shall not be less than ten nor more than thirty days from the date of mailing said notice, and shall be at such place to be determined by the commissioner, as shall be most convenient to all the parties to the hearing: *Provided*, In case the nursery and principal place of business is within this state then hearing shall take place in the county where the nursery or principal place of business is located for the attendance of witnesses.

The complainant and the person complained of shall have compulsory process to compel the attendance of witnesses at such hearing, to be issued by the commissioner. Hearings may be held by the commissioner in person or by the assistant who shall report in writing a synopsis of the testimony taken and his findings thereon to the commissioner for his decision. If upon such hearing or report it shall appear to the satisfaction of the commissioner that the person complained of has violated or is violating or failing to comply with the provisions of this act or the laws of the State of Washington relating to horticulture, he may revoke the license of such person, and no new license shall issue to such person until it shall be made to appear to the satisfaction of the commissioner that the cause of the complaint has been removed.

From the decision of the commissioner revoking a license, or refusing to issue a new license, an appeal shall lie to the superior court of the county where the hearing shall have been held.

SEC. 23. It shall be unlawful for any person to deceive or defraud any person on the sale of any nursery stock by substituting inferior or different varieties from those ordered, or to wilfully or intentionally bring into this state or to offer for sale or distribution within this state or to ship, sell or deliver upon any sale any nursery stock that is infected, and in case of any such deceit, fraud or substitution, the person, firm, or corporation damaged or injured thereby shall have recourse against the bond filed by the licensed nurseryman or dealer from whom such stock has been purchased, for all damages sustained, which damages may be recovered at the suit of the party injured against the nurseryman or dealer causing the damage and the sureties on such bond in any court of competent jurisdiction.

SEC. 24. It shall be the duty of all nurserymen and dealers in nursery stock and all salesmen, solicitors and agents therefor to give to every person ordering any nursery stock a duplicate copy of such order which shall

show: (a) the name of the nurseryman from whom ordered and the name of the solicitor, salesman or agent taking such order: (b) the season of the order and the date when delivery is to be made: and, (c) the number, name, and price of each variety of tree or plant ordered.

SEC. 25. It shall be the duty of every person growing or dealing in nursery stock to notify the commissioner of agriculture of his, their or its intention to ship any nursery stock from one point in this state to another or from any point without the state to a point within the state for sale or delivery or for planting or propagation. Such notice shall be made in writing and in duplicate and signed by the person giving the notice and shall show the name and address of both the consignor and consignee, and the name of the person or transportation company from whom the consignee is to receive such goods, and whether such nursery stock has been inspected and approved at the initial point of shipment within this state by an horticultural inspector. Said notice shall be mailed not later than the date of shipment and the duplicate thereof shall be mailed to the horticultural inspector stationed nearest to the point of consignment and all such shipments of nursery stock shall be plainly marked on the outside of the package with the words "nursery stock." A descriptive invoice of all goods shipped during the season shall be mailed to the commissioner of agriculture before the first of July following shipment.

SEC. 26. In the event of the shipment into this state from any point without this state of any nursery stock by a person, firm or corporation not licensed to do business in this state as in this act provided, it shall be the duty of the purchaser or person receiving such nursery stock to have the same inspected by a horticultural inspector in the same manner as is required upon the delivery of nursery stock sold and delivered by a licensed nurseryman or dealer in nursery stock within this state and to pay an inspector's fee of ten per cent. of the invoice price of such shipment, provided that the minimum fee for such inspection shall

be fifty cents and the actual and necessary traveling expense of the inspector making the inspection: *And provided further*, That for the inspection of shipments of nursery stock shipped to nurserymen or dealers in nursery stock licensed under the provisions of this act to do business in this state, no fee shall be required.

SEC. 27. Upon the arrival at its point of destination of any nursery stock shipped into this state from another state or country or shipped from one point within this state to another, it shall be the duty of the freight agent, express agent or the agent of the persons or transportation company having such shipment in charge for delivery, unless the same is accompanied by a certificate of inspection and approval by a horticultural inspector of this state showing that the same was inspected and approved at the initial point of shipment within this state, to notify the horticultural inspector stationed nearest to the point where said shipment is received, of the receipt of such shipment giving the name of the consignor and consignee and stating that such shipment is ready for inspection and delivery. Said notification may be by telephone or telegraph, or by written notice delivered personally to said inspector or to some person of suitable age and discretion at his residence or office, or by mail addressed to said inspector at his place of residence or at his office; and it shall be unlawful for any such agent or person having such shipment in charge to deliver the same to the consignee or to any other person until the same shall have been inspected by a horticultural inspector: *Provided, however*, That such agent shall not be required to hold such shipment more than forty-eight hours after notifying the inspector as aforesaid, except in case the notice is given by mail, in which event such shipment shall be held for such period beyond said forty-eight hours as is ordinarily required for the delivery of mail to the address of said inspector; *And provided further*, That no inspection at the point of delivery shall be necessary if the shipment is accompanied by a certificate of a horticultural inspector of this state showing inspection and ap-

proval at the initial point of shipment within this state as aforesaid, and upon the delivery of such shipment to the consignee, the agent or person making the delivery shall deliver such certificate of inspection to the consignee and retain the duplicate to show his authority for making delivery without inspection. Any nurseryman or dealer in nursery stock within this state may demand the services of an inspector at his place of business or point of shipment during the shipping season by paying four dollars per day for his services.

Upon the arrival at its point of destination of any shipment of fruit or vegetables shipped into this state from another state or country, it shall be the duty of the freight agent, express agent or agent or persons or transportation company having such shipment in charge for delivery, to notify the horticultural inspector stationed nearest to the point where said shipment is received, of the receipt of such shipment giving the names of the consignor and consignee, and upon the delivery of such shipment to the consignee or his order, the agent or person making such delivery shall demand and receive from the person to whom such shipment is delivered a receipt therefor showing the name and address of the consignee or his order and the place to which said shipment is to be removed, and shall thereupon mail said receipt to the horticultural inspector stationed nearest to the point where said shipment is received.

SEC. 28. No inspection of shipments of nursery stock as provided in the last preceding section shall be made until all transportation charges thereon have been paid: *Provided, however,* That the agent or person having such shipment in charge for delivery may waive in writing the payment of such transportation charges prior to inspection, and in case the transportation charges are not paid or waived such shipment shall be held until the same are paid and inspection had.

SEC. 29. It shall be the duty of every horticultural inspector upon the inspection of any nursery stock found

free from diseases and pests, to deliver to the owner or person in charge thereof a certificate of inspection over his signature, showing the date of inspection and stating that such nursery stock was not infected, which certificate, in case inspection be made at the initial point of shipment, shall be in duplicate, and it shall be unlawful for any person to substitute for any such nursery stock so inspected and approved, any other nursery stock not covered by said certificate, or to ship, sell or dispose of any other nursery stock than that actually inspected and approved, under such certificate of inspection, provided that the inspector may issue certificates of general inspection for shipment to points within this state in addition to the regular certificates of inspection.

SEC. 30. Every person violating or failing to comply with the provisions of this act shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined in any sum not less than $25.00. All fines imposed under the provisions of this act shall, when collected, be paid to the treasurer of the county where imposed and remitted to the state treasurer and placed to the credit of the general fund.

SEC. 31. Whenever any person is about to or threatens to violate any provision of this act, the commissioner of agriculture may, with the advice of the prosecuting attorney of the county where such violation is threatened or of the attorney general, begin an action in the superior court of such county in the name of the state upon the relation of such commissioner to restrain and enjoin such threatened violation, and in case such prosecuting attorney shall fail or refuse to begin such action upon the request of the commissioner, the same may be begun by or under the direction of the attorney general. In such action no bond shall be required for the issuance of a restraining order or injunction, but the state shall be liable for any damages occasioned by the unlawful suing out of such restraining order or injunction.

SEC. 32. The commissioner of agriculture, the assistant commissioner and all horticultural inspectors are hereby authorized and empowered to seize and hold for use as evidence any article or thing found in the possession of or used, held for shipment, shipped, offered for sale or sold by any person in violation of any of the provisions of this act or of any law relating to horticulture, and to serve and enforce compliance with any restraining order or writ of injunction or mandate or any other writ issued by any court under the provisions of this act.

SEC. 33. It shall be the duty of all clerks, bookkeepers, express agents, railroad officials, employees, or employees of common carriers to render to the commissioner of agriculture and his inspectors all the assistance in their power in tracing, finding, or discovering the presence of any article named in this act. Any refusal or neglect on the part of such clerks, bookkeepers, express agents, railroad officials, employees, or employees of common carriers to render such friendly aid to assist in the carrying out of the provisions of this act shall constitute a misdemeanor.

SEC. 34. That all acts incorporated and enumerated in the following schedule, and all acts and parts of acts in conflict with the provisions hereof, are hereby repealed.

SCHEDULE.

Sections 3075, 3079, 3080, 3083, to 3110, inclusive; 3113, 3115, 3116, 3117, 3119, 3120, 3122 to 3127, inclusive; 3131 and 3134 to 3139, inclusive of Remington and Ballinger's Annotated Codes and Statutes of Washington.

SEC. 35. This act is necessary for the immediate preservation of the public peace, health, and safety and shall take effect immediately.

Passed the House March 1, 1915.

Passed the Senate March 8, 1915.

Approved by the Governor March 19, 1915.

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