UNIVERSITY OF IDAHO

AGRICULTURAL EXPERIMENT STATION

SANDPOINT SUBSTATION

The Cut-Over Lands of Northern Idaho

By

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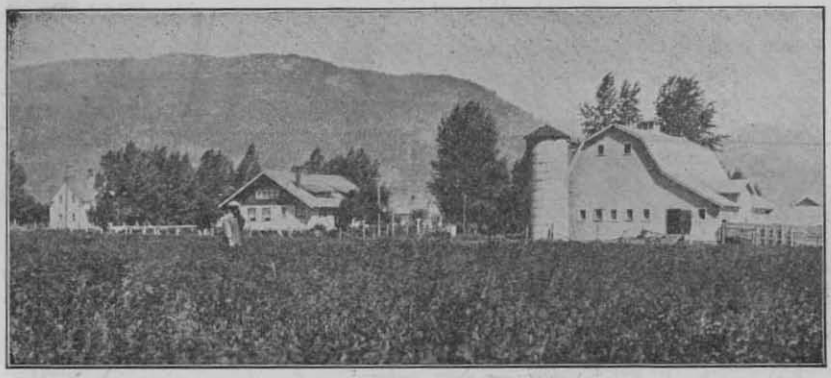

Field of alfalfa at the Sandpoint Substation

Bulletin No. 158 **May, 1928**

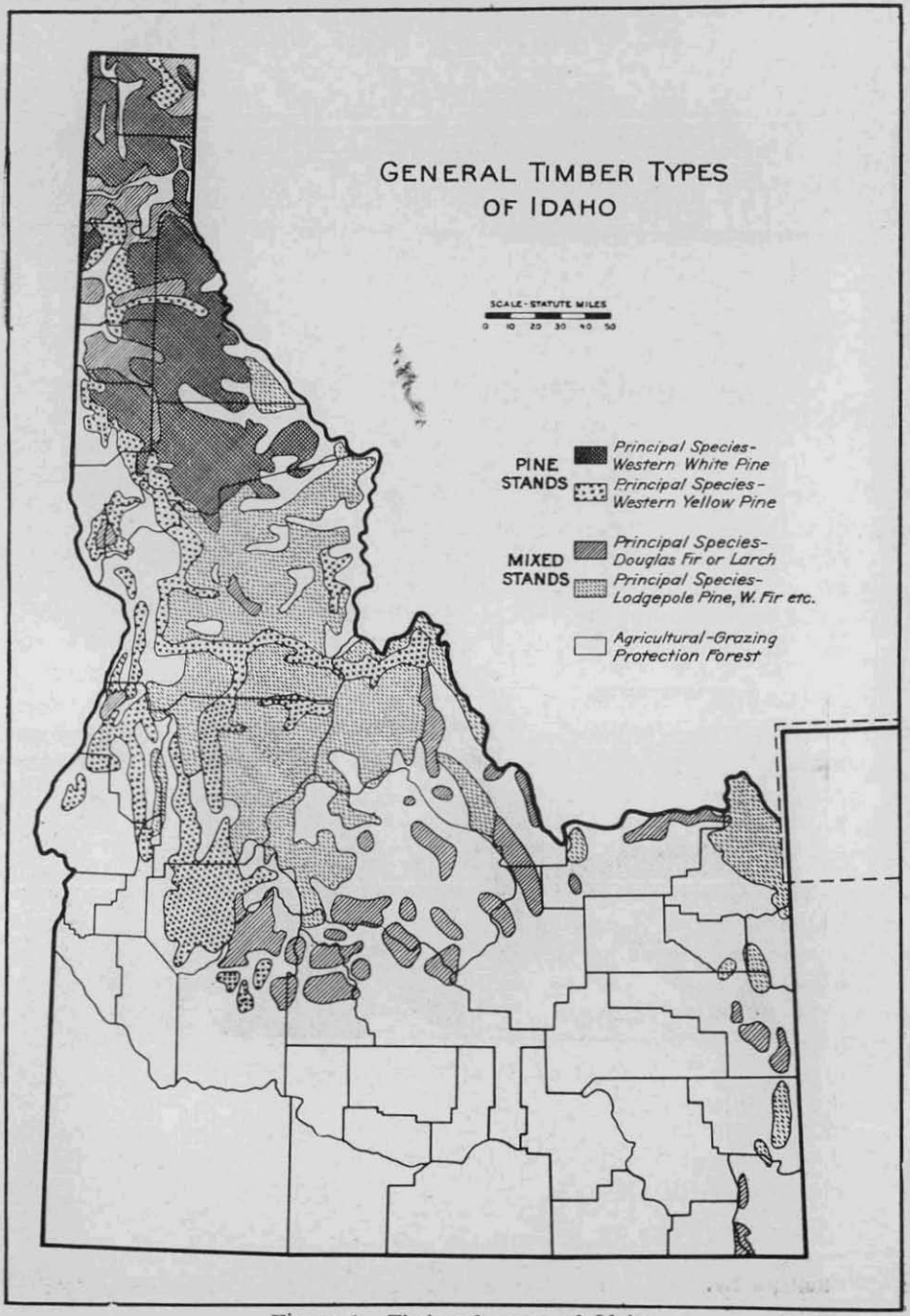

Figure 1. Timbered areas of Idaho

THE CUT-OVER LANDS OF NORTHERN IDAHO

INTRODUCTION

There is a constant demand for information regarding the conditions and farming practices that prevail in the counties of northern Idaho that have substantial areas of cut-over land. In view of the fact that most of these inquiries come from sections where conditions are quite different from those that prevail here it is deemed advisable to get material together in bulletin form that will give some of the major characteristics of the area in question. It is to be understood that in the discussion which follows any of the points described must be of a general character. Sections of northern Idaho vary widely in soils and climatic conditions and in adaptability to crops and to animal industries. Methods which hold true in one locality are not necessarily adaptable to another a short distance away.

The Sandpoint Substation of the University of Idaho Agricultural Experiment Station is located at Sandpoint. Its location in one of the extensive logged-off areas was chosen to cover as nearly as possible the prevailing conditions and thru experimentation to aid in the development of better cropping and soil management practices. While the results of experimental work presented in the tables which follow may not be adaptable over the whole of the region yet they do have value over a large portion of the area with which the station deals. It also is well to note that the station location is on land of fairly average fertility.

CHOICE OF LAND

To a newcomer in the cut-over areas the choosing of suitable land for his farming operations is of first consideration. This requires close study and investigation. The question of the value of the land and suitability for his agricultural purposes is one for him alone to judge. Ideas of farming possibilities can be obtained from other farmers in that neighborhood but at the same time there may be unsuitable conditions that will not be seen at first glance. In view of these factors it is nearly always advisable to one contemplating the purchase of cut-over land to make a thoro study of the conditions that prevail and if possible to be prepared financially to tide over the time of development of the farm until it can become in a large measure self-supporting.

Practically all of the land that is available for settlement is privately owned with a large bulk of it in the hands of lumber companies. This land owned by lumber companies with the timber cut off comprises the main source of supply of new lands available to settlers. Besides these raw lands there are others which have reverted to the original owners after being partially developed and still others well developed which the owner desires to sell for reasons of his own. The kind of a farm that is to be desired, therefore, will depend on the individual and on the amount of capital he has available for the purchase.

LAND COSTS

The costs of logged-over land present a wide variation mostly dependent on agricultural value of the land, location, ease of clearing and water supply. Information which has been received from companies having a considerable amount of this land for sale shows a range of prices from $1.00 to $30.00 an acre. The bulk of the desirable land probably averages about $20.00 an acre. Interest charges on deferred payments on land seem to be standardized at 6 percent. Method of payment is a variable factor. Certain companies require 5 percent cash payment on the value of the land, others 10 percent and others 20 percent. The time to complete payments also is variable with some requiring the balance of the purchase price to be made in 4 annual payments, others 5 and others in 10. Several companies offer special advantages where a certain specified amount of the land is cleared. With one company a 10 percent cash payment is required. Where none of this land has been cleared payments and interest are deferred the first and second years and only a 5 percent payment required for the third and fourth years. Another company requires a 10 percent

cash payment with 10 yearly payments at 6 percent. Where a specified amount of clearing is done each year the payments and interest can be deferred for a period of five years. The amount of clearing required each year is based in this case on the rate of 3 acres for each 40 acres purchased.

The costs of partially developed or fully developed farms depend on amount and value of the cleared or potential crop land, the amount of clearing done, location, water supply, buildings and fences. This phase of land costs cannot be covered in general terms because of the extremely wide range of conditions that are encountered. Information on such farms can be obtained from realty and investment companies, the Federal Land Banks, or from individuals having such lands for sale.

TRANSPORTATION AND MARKETS

Most of the northern Idaho area is well supplied with transportation and market facilities. The region is served by the main lines of several transcontinental railroads and also by many branch lines of these systems. Highway development is making rapid progress and many localities are served by auto transportation and freight companies.

Local markets form important centers in the marketing of many products. For the disposal of farm crops and livestock the larger markets are always available. Large amounts of farm products are shipped to Spokane, Portland, Seattle, and to the eastern and middle western centers.

1925 *CENSUS REPORTS*

The major features of the northern counties are given in the following tables which have been taken from the United States agricultural census reports of 1925. It must be borne in mind that the principle areas of cut-over land lie in the counties of Boundary, Bonner, Kootenai and Benewah with lesser amounts in Latah, Lewis and Nez Perce and still less acreages in Shoshone, Clearwater and Idaho. Since the 1925 census was compiled the most striking changes have been the reclamation of large areas of over-flow land along the Kootenai river in Boundary County and the rapid development of the alfalfa acreage in Boundary, Bonner, Kootenai, Benewah and Latah counties. There also has been a stimulation in the clearing of land due to the availability at a low price of the left-over war explosives. As in other farming centers there has not been a very rapid expansion in population but at the same time there has been a steady influx of settlers and more land is being developed all the time.

TABLE 1 SHOWING NUMBER OF FARMS AND FARM ACREAGE 1925 CENSUS

	Number farms	Approximate County Acreage	Percentage in Farms	Farm Acreage	Average per Farm	Total Crop Land	Pasture Land	Woodland not used for pasture	All other land
Boundary	304	816,640	7.0	57,552	189.3	14,328	34,690	6,943	1,591
Bonner	1,107	1,118,720	13.7	153,699	138.8	30,860	96,512	11,136	15,191
Kootenai	1,288	801,920	23.1	185,356	143.9	66,407	101,562	11,048	6,339
Shoshone	118	1,662,080	1.0	16,294	138.1	2,817	10,491	2,521	465
Benewah	477	503,040	19.2	96,704	202.7	40,304	40,277	9,823	6,300
Latah	1,286	685,440	31.1	213,299	165.9	134,071	56,961	9,250	13,017
Clearwater	438	1,605,120	5.1	82,260	187.8	24,200	49,745	6,675	1,640
Lewis	622	300,800	71.0	213,630	343.5	127,474	52,368	4,198	29,590
Nez Perce	1,165	544,640	62.2	338,988	291.0	163,373	154,633	4,080	16,902
Idaho	1,508	5,464,960	11.1	606,612	402.3	192,548	368,555	10,017	35,492

TABLE 2 SHOWING THE NUMBER OF LIVESTOCK IN COUNTIES 1925 CENSUS

	Number of horses	Number of cattle	Number of sheep	Number of swine	Number of chickens
Boundary	846	3,816	629	683	15,789
Bonner	1,908	7,158	1,120	1,247	42,630
Kootenai	3,218	6,721	1,187	1,822	67,628
Shoshone	397	1,082	167	143	4,309
Benewah	1,992	3,154	530	1,783	18,693
Latah	6,156	7,842	1,490	6,206	61,047
Clearwater	1,570	3,966	1,212	2,096	18,087
Lewis	5,272	6,081	3,777	6,883	29,811
Nez Perce	7,936	11,458	8,184	10,671	62,820
Idaho	11,345	26,290	50,016	50,610	80,493

TABLE 3 SHOWING ACREAGE OF PRINCIPLE CROPS 1925 CENSUS

	Corn	Wheat	Oats	Barley	Hay total Acres	Timothy alone	Timothy & clover	Clover	Alfalfa	Potatoes	Apple trees	Pear trees	Plum & prune trees
Boundary	49	1004	1520	35	10550	1776	950	70	616	205	10056	440	349
Bonner	64	580	896	15	22202	3686	12354	1005	677	457	36317	1986	2308
Kootenai	1536	13751	5878	208	20255	2114	4666	1077	1997	967	173181	8489	6608
Shoshone	2	5	71	4	2466	900	1178	7	84	58	1704	183	235
Benewah	115	12722	4093	359	10419	3836	2205	120	422	308	7036	432	983
Lewis	1385	59582	5115	10102	17931	3084	651	119	1258	517	15647	951	1063
Clearwater	879	3848	2318	689	12105	3160	2763	332	1923	274	10786	1745	1803
Latah	948	43036	16146	1260	31603	4625	4019	379	16552	746	25389	4244	6966
Nez Perce	7070	59356	6309	8949	29497	1553	1084	781	7445	661	60415	4158	18587
Idaho	2705	67985	8509	16956	43488	7270	2445	1466	7840	682	40266	4052	5723

CLIMATIC CONDITIONS

The cut-over and timber regions of northern Idaho are located on the western slope of the Rocky Mountain system and consequently a large proportion of the land in the timbered counties is mountainous or hilly. In the mountainous districts the glaciers and streams have cut deep valleys and have been the agents in the formation of the agricultural benches and bottom lands. In a region that presents such a wide range of elevations there is likewise a wide climatic variation. More generally it is found that the precipitation increases from the western boundaries of the state to the mountains on the east. Length of the frost free period increases from east to west.

The prevailing wind direction is from the southwest. Occasional wind and dust storms occur in the summer months and in the winter the region may be visited by cold north winds. These winds, however, are not of long duration and are not as common as in the territory east of the mountains. Snow cover is variable. In the more mountainous country the snow stays until well into the spring months while at the lower elevations a snow cover throughout the winter months is rare. The climate as a whole is moderate with cool nights in the summer months and days in which the heat is not oppressive. The months of heaviest precipitation are from November to February and the months of the least rainfall July and August.

In the table which follows a summary is given of the major climatological features from weather bureau stations either in or adjacent to forested areas.

TABLE 4 SHOWING A SUMMARY OF THE U. S. WEATHER BUREAU RECORDS FOR VARIOUS LOCALITIES ADJACENT TO OR IN THE CUT-OVER AREAS OF NORTHERN IDAHO

Location	Length of record years	Average precipitation inches	Precipitation April 1 to Sept. 1 inches	Elevation feet	Mean Temperature	Highest temperature	Lowest temperature	Average annual snowfall inches	Average number days with 0.01 precipitation or more	Average date last killing frost in spring	Average date first killing frost in fall	Prevailing wind direction
Porthill	28	21.43	6.58	1665	44.3	100	-28	76.4	102	May 11	Sept. 29	SW
Bonners Ferry	9	21.12	7.43	1850	44.3	99	-25	66.2	92	May 4	Sept. 19	SW
Sandpoint	10	27.51	8.42	2100	44.9	99	-21	84.5	114	May 22	Sept. 19	SW
Priest River Forest Exp. Station	9	31.06	9.37	2380	42.5	101	-30	92.0	144	June 14	Sept 17	SW
C. .d'Alene	15	24.70	6.41	2157	47.6	104	-34	52.3	99	May 12	Oct. 14	S
Kellogg	16	30.52	9.48	2305	45.4	104	-23	62.5	134	May 17	Sept. 24	SW
St. Maries	22	26.92	7.67	2155	47.2	106	-26	54.6	114	May 6	Sept. 19	NW
Potlatch	6	24.70	7.54	2550	44.8	104	-27	61.4	117			SW
Moscow	27	22.07	6.65	2748	46.6	103	-18	52.5	104	May 6	Oct. 7	SE
Orofino	16	28.03	8.15	1027	49.8	111	-24	56.0	121	Apr. 28	Oct. 14	
Kooskia	12	22.71	9.07	1261	49.4	111	-30	37.1	99	May 1	Oct. 11	SW

SOILS

The soils of the logged-off areas of northern Idaho present extremely varied and diverse types. Some of the types are very fertile and produce good crops from the first; others are very poor and suited only for grazing or reforestation. Soil surveys, completed in Kootenai, Latah, Nez Perce and Lewis counties, give the characteristics of the soils in those regions in detail. For purposes of general discussion of the area the main types to be found can be grouped as rolling wind blown soils, bench soils, alluvial river bottom soils, gravel and sandy soils, peat and muck soils, scab land and rough mountainous land.

Practically all of these soil types with the exception of the alluvial river soils and the muck and peat soils have supported coniferous forests. The trees to be found over the area are western yellow pine, western white pine, spruce, lodgepole pine, Douglas fir, white fir, cedar, hemlock and tamarack. The alluvial soils and the peats and mucks for the most part supported a growth of deciduous trees such as cottonwood, alder, birch, thorn apple, willow and quaking aspen. The fertility of these soils varies widely and can be best discussed by considering each type singly.

The rolling wind blown soils are to be found in Nez Perce, Lewis, Latah, Benewah and Kootenai counties. These lands usually are fairly well supplied with plant food elements and support good crops of alfalfa, clover and other legumes as well as wheat, and other grains.

The bench soils do not differ greatly in physical aspect from those mentioned above. They constitute the most general farming type of the whole area. These soils have resulted either from the disintegration of the native rock or have been laid down by glaciation and water deposits. Many of the soils of this character are underlayed with a clay layer 6 to 10 inches thick sometimes erroneously called hardpan. These soils have a good water holding capacity and crops on them very seldom suffer from drouth. These soils likewise support good crops of legumes and are well adapted to fall seeded grain. Crop production can ordinarily be increased by building up the organic matter, nitrogen and sulfur content of the soil.

The alluvial soils are the most fertile in the cut-over district and are found in the bottom soils of the various streams. The largest areas of this type are along the Kootenai,

Clarksfork, Coeur d'Alene, St. Joe and St. Maries rivers. These are subject to overflow during the seasons of high water except where the land has been properly diked. These soils are high producers of all kinds of grain, root crops and hay.

The gravelly and sandy soils are the result of glacial outwash and vary from a coarse gravel to fine sand with intermediate gradations. Some of these phases are quite fertile. Due to the fact that they have a poor water holding capacity many of them are unsuited for cultivation. Some require irrigation to supplement natural rainfall. Summer fallowing is practiced over a portion of this area. Soils of these types are found mainly in Kootenai county and in the southern portion of Bonner county. Fall wheat is the crop most commonly grown under dry farming conditions. Where irrigation is practiced a large part of the land is devoted to orchards.

The peat and muck soils form a minor portion of the agricultural land. These organic soils are the result of plant accumulations in lakes or dammed up water courses. After these soils are drained they are well adapted to the production of timothy and other grasses. Oats and peas form the best adapted grain crops and in the original state of fertility produce very heavy crops. After continued cropping it usually is necessary to resort to commercial fertilizers, particularly phosphate and potash, to maintain high production. Most of the peat and muck areas are found in Boundary, Bonner, Kootenai and Benewah counties.

The scab land and the rough mountainous land comprise the greatest area of the cut-over lands. This can be used for reforestation or for the development of the farm wood lot if in the farming area. The land after logging usually reverts to second growth timber and brush. If its does not grow up to timber, grass and clover will become established and together with the brush will form grazing land. The amount of stock that it will maintain depends on the growth present. It is probably better for sheep and beef cattle than for dairy stock. After being burned over these areas are relatively easy to seed to native forages.

This in general comprises the main soil conditions. There are many gradations. Smaller areas present special conditions not common enough to warrant specific discussion. In general however the condition usually found in the upland cut-over soils is a fairly high water holding capacity, a deficiency

of organic matter, sulphur and nitrogen, an acid top soil and a slightly alkaline subsoil, good natural drainage and a soil that is easy to work.

IRRIGATION

Irrigation is not practiced very extensively over much of the cut-over area of northern Idaho. In certain sections where fruit is being grown on a large scale irrigation is depended upon. In those sections the soils are usually of the coarser types and have a poor moisture holding capacity.

Many farmers have access to small streams or creeks which they divert and use for garden truck or for a portion of their farming land. This practice is not very general and could be developed to a greater extent than is now being done. While moisture is available for good crop production from the natural rainfall, yields in many places can be increased by the addition of water at critical periods during the growing season.

LAND CLEARING

Methods of clearing land and the costs involved are dependent on many factors. Several of the points that have to be taken into consideration are size, number and kind of stumps per acre, condition of the soil and the length of time since logging operations.

Since hardwood trees are not found extensively over the cut-over area and also because they rot in a relatively short period of time the discussion of clearing operations will be concerned entirely with the stumps of coniferous trees. The nature of the root systems of the various trees is of prime importance in blasting stumps. Tamarack and red fir both have a heavy taproot. Red fir rots more rapidly than tamarack. White pine has a fairly heavy taproot and also has well developed lateral roots. Cedar is shallow rooted. Yellow pine has a well developed taproot and also fairly heavy lateral roots. White fir and hemlock are shallow rooted and decay in a relatively short period.

It is well to note that these coniferous stumps do not rot readily except in a few cases as previously mentioned. As stumps get older the small fibrous roots decay and less powder is required for blasting. This process is hastened by the seeding and pasturing of the land. Newly logged land is the most ex-

pensive to prepare for farm land. It not only requires more powder and labor to remove the fresh stumps but also necessitates the removal of undergrowth and materials left from the logging operations.

Usually after logging, clover and grass become seeded down and furnish range or pasture for livestock. The growth of the crops increase the decay process in the stumps and the use of pasturing by livestock helps to keep down the second growth. Stump removal under such conditions is simplified

Figure 2. Slash and small trees left after logging in Douglas fir and larch timber

because it does not require as much powder and the stumps come out cleaner than where newly logged.

Where second growth has become established a combination of the two foregoing conditions is obtained Any growth of suitable size is ordinarily made into cordwood or is cut and burned. A good burn under such a clearing system helps greatly in the preparation of the land for stumping as it usually is necessary to pile and burn all the down stuff before stumping. Second growth stumps of trees which are not too old will rot rapidly and in a few years can be pulled by a team or blasted with a light charge of powder.

Burning throughout the cut-over area is a matter that is covered by state forestry regulations. During the fire season a

permit to burn stumps or slash is required from the State Forester or his authorized agent. At other times of the year the debris from stumping operations can be disposed of according to the desires of the settler. When burning is done in the neighborhood of the national forests or other timber lands great care must be exercised to prevent the fires from spreading to those areas as the one responsible for the fire getting beyond control is held liable for the damage done.

The methods of stump removal commonly used in the cut-over sections are blasting with powder, pulling, powder and pulling or burning. Most of the stumping is done by a combination of powder and pulling. Where powder alone is used an effort is made to remove everything. Any fragments of stumps that are left then can be pulled by a team with a chain. This is one of the fastest methods of clearing and over much of the area one of the cheapest. The main item of expense comes in the purchase of powder but at the prevailing prices of powder and labor the powder is considered the cheaper of the two. It also gets the land in shape for crop in the shortest possible time.

The use of stump pullers, either hand, horse or tractor types, have not found a general use as the sole method of removing stumps. The process is slow with either hand or horse pullers and with the heavy tractor types the cost of the equipment is too great for the average farmer or group of farmers. When stumps are removed in this manner they usually carry large quantities of soil with them and this must be removed before the stumps will burn.

The method most commonly used and one requiring less capital is that of blasting and pulling. In this process all the shallow rooted stumps can be pulled by a team with blocks and tackle. All the larger heavy rooted stumps are split with powder. Compared to blasting the stump out clean this method of cracking or splitting requires considerably less powder. The stump can then be blocked out in several pieces by the use of team and cable. A smaller hole is left than by the use of powder alone. The method appeals to many of the farmers for the stumping can be done at seasons of the year when the press of labor is not so important and also because it does not require such a large cash outlay per acre for powder.

Most of the stumping powders are of a 20 to 30 percent grade. When powder is purchased in carload lots by the pooling of orders the cost will probably be between $12.00 and $15.00 per

hundred pounds. When free use is made of powder in clearing the amount used probably will vary between 100 and 225 pounds per acre depending on nature of the land, number of stumps, etc. Where small stumps and cracked stumps are pulled the amount of powder used will ordinarily run one-third to one-half of that required for clean blasting.

Burning is not used extensively over a very large portion of the area as a method of stump removal. Most of the stumps are too small for the use of special burners and where there are large number of stumps per acre they require too much attention. Improper burning usually results in the stump being burned off just below the surface of the ground and it presents a difficult problem of removal when discovered in plowing or other tillage operations. On the yellow pine areas where the stumps are large and scattered very good results have been reported from burning by the char pit method. These stumps are resinous, and burn readily and completely. Where this can be done satisfactorily stumping is an inexpensive process but over the great majority of the forest land of northern Idaho the method is impractical.

After the land has been cleared and the stumps and other debris burned the next problem is that of the preparation of the land for a crop. The stump holes can be filled by hand with a grub hoe or shovel or they can be plowed in or filled by using a scraper. Stump holes should be well filled as they settle and leave depressions that make it difficult to use horse drawn equipment. After the land is plowed it is good practice to level the land by the use of a drag or float. The use of these tools after a few plowings makes the land easier to handle in subsequent cropping operations.

In the following table is presented a record of the cost of clearing a field of 6.68 acres on the Sandpoint Substation in the spring of 1924. Logging had been done 25 years before. The cost charges are reduced to the acre basis. On this land the down stuff had been removed and there was no second growth. At that time the powder cost was $8.00 per hundred pounds, it being one of the left over war explosives. Man labor was charged at the rate of 50c per hour and a two horse team at 50c per hour. In this stumping operation effort was made to remove the stumps so that anything that was not shot clean could be pulled by a team without the use of block and line.

Table 5 Showing the Cost of Clearing an Acre of Land and Preparation for the First Crop on the Sandpoint Substation, 1924.

Item		Cost per Acre
Boring holes and shooting stumps		$12.20
Picking up Stumps		12.49
Pulling snags		12.98
Filling holes		1.72
Grubbing brush		1.42
Picking brush		1.20
Powder 145.2 pounds		11.62
Caps and fuse		8.70
Breaking		6.30
Disking		2.98
Leveling		.82
Average number stumps per acre	112	
Average number caps per stump	1.1	
Average pounds powder per stump	1.3	
Total cost		$72.43

The most satisfactory time to do clearing is when the soil is well filled with moisture. This condition prevails from the time the snow leaves until well on into spring and also in the late fall. Less powder is required for clearing at these times and a better job of blasting is usually done.

SOIL PREPARATION AND TILLAGE METHODS

With the precipitation which this region receives summer fallowing finds but little place and continuous cropping is practiced. Diversification of crops is well established and while there are no specific methods in use over the whole of the area the rotation systems are usually built around a legume base. Under such conditions the farm tools used are much the same as in other general farming localities. Fall plowing is the common practice and in most cases is to be recommended. More of the winter and early spring moisture is retained and it also permits of earlier seed bed preparation than where spring plowing is done. Thoro disking and harrowing in the spring are essential in the preparation of good seed beds. Listing or the stubbling in of grain crops has not met with success. Rolling the lighter soils with cultipackers or other rollers is beneficial in bringing on a more uniform germination of fall and spring

grains and legume seedings. Combined harvesters and threshers and hay loading equipment are not used except on large acreages. Most of the harvesting and tillage machinery is handled by horses but in many places tractors are becoming more common. Where tractors are used the land needs to be well cleared and of sufficient acreage to justify their use. The land for the most part is easily worked and does not clod or puddle readily and consequently no special cultural implements are necessary.

CROPPING METHODS AFTER CLEARING

When newly logged land is obtained one of the first steps in the preparation of a farm is to seed down as much of the land as possible to clover and grass, except that which is to be cleared during the first year. This procedure establishes the pasture land and also benefits the soil in building up fertility. It likewise helps in the decay of the stumps. Seeding of clover and grass can be made in the fall or in the early spring and in ordinary years good stands can be obtained. Seeding is done in such cases without any previous soil preparation. The seed is covered by the action of the rains and frosts and by fall the growth makes good coverage and a fair amount of pasture. Alsike, red clover, timothy and bluegrass are the crops in most common use for this purpose. Where logging has been completed for some time clovers and grasses come in naturally and often represent the appearance of having been specially seeded.

Where land is cleared sufficiently early in the spring it can be put into crop immediately. Experience and experiments have shown that the debris from the coniferous trees have a depressing effect on crop growth and until this is burned or the condition is overcome in the soil normal production cannot be expected. Where the land is left in a summer fallow condition these effects usually will disappear by fall and seedings of fall grain will produce a satisfactory crop. On older logged lands which have been broken up out of sod the effect of the coniferous products will have disappeared.

On new land the primary consideration is that of obtaining a hay crop the first year. For this purpose grain hay offers the best solution but even that does not usually give a very great production. Peas and oats or oats alone offer good feeds and are commonly used. Spring wheat also is used to some extent. Millets and the sorghums and vetch have been tried but with poor success. Growth of spring seeded legumes is not suf-

ficient to furnish enough hay to put up. As most of the men are interested in some form of livestock farming the customary procedure is to get the land into a high yielding legume, particularly alfalfa. Before an alfalfa seeding is made, however, the soil should be cropped for a long enough period to kill out the grass. When alfalfa is once established the hay problem is usually well settled. Winter wheat is well adapted over much of the area except on the low wet lands and is very seldom subject to winter killing. It is the highest producing of the grains and not only furnishes feed but also supplies a cash crop. Potatoes and other root crops, while they do not yield as well on new land as on other land in which the fertility has been increased thru the use of legumes or manure, make a fair production and help out with the immediate needs of the farmer.

Figure 3. Second growth about 25 years after logging.

Usually by the second year the pasture will be producing well and seedings can be made to clover and alfalfa. Grain hay or the cutting of hay from among the stumps may be resorted to to take care of the hay problem that year. By the third year the problem of having sufficient hay should be well taken care of by previous seedings of permanent hay crops.

Crops and Farming Practices adapted to the Cut-over Areas.

In the discussion which follows most of the material presented has been obtained on the Sandpoint Substation of the University of Idaho Experiment Station. As previously men-

tioned these results may not be applicable to all conditions but it is believed that this work has general application over a large share of the cut-over area.

ALFALFA

Prior to the introduction of alfalfa the hay situation for most of the farmers on cut-over lands was acute in years of low spring and summer rainfall. With the more general introduction of this crop the hay problem has been greatly stabilized and the way is paved for the introduction and maintenance of more and better livestock. First experiences with alfalfa were not uniformly successful and it has been only within the last five years that a general use has been made of this crop. Chief difficulties in obtaining and maintaining satisfactory stands were due primarily to the use of unadapted seed, lack of inoculation, poor seeding practices and unsatisfactory seed bed preparation. When well established alfalfa will maintain good production for a long period of years and will furnish two good cuttings a year and in some places a third crop. Alfalfa requires a well drained soil and is not adapted to low wet areas where water stands for any length of time. All grass should be completely killed out by cropping systems using grain or potatoes before the land is to be put into alfalfa. Plowing should be done in the fall and the seed bed worked up early in the spring by thoroly disking and harrowing. Planting should not be made until after the danger of the heavy spring frosts is past. Grimm or other hardy varieties of alfalfa are to be recommended over the less hardy common strains because they stand more severe winter conditions. On well prepared land 10 pounds of seed usually are sufficient to obtain a good stand. The seed should be inoculated prior to seeding with cultures of nitrogen fixing organisms. Seeding can be done either by broadcasting or drilling. Broadcasting is to be recommended on most farms because of the rough, uneven character of the land. Seeding with a drill on such land causes an uneven germination and a variable stand. On most soils alfalfa will not withstand the use of a nurse crop. After seeding broadcast the seed is covered with a light harrowing and then rolled either with a commercial type of corrugated roller or with a home made log roller. Unless the first year's crop is heavy enough to make a crop of hay or a heavy growth of weeds are present, which would come in the hay the second year, it is usually not advisable to clip the crop. Alfalfa comes into its best pro-

duction about the third year. Gypsum is used to furnish the sulfur, necessary to maintain high yields. Information on gypsum will be found further on in this bulletin under the discussion of fertilizers.

RED CLOVER

Red Clover is not grown very generally as a pure stand but in most cases in a combination with timothy. This mixture is widely grown and in moist years makes good yields. In dry years the yield is not so good and often seriously handicaps the grower in his livestock operations. Over most of the cut-over territory red clover acts as a perennial and will maintain a good stand for several years. It is easy to get started under freshly logged land conditions but when it is reseeded the same care should be used in getting a stand as with alfalfa. Twelve pounds usually is sufficient seed to use per acre.

ALSIKE CLOVER

Alsike is used under much the same conditions as red clover but it is adapted to more moist soils than either red clover or alfalfa. Alsike suffers more from drouth than either of the two legumes previously discussed. The seed is relatively cheap and is used extensively in seeding woodland pastures in conjunction with timothy. When seeded alone six pounds of seed per acre is sufficient and the same method of seeding suggested with alfalfa is used to good advantage.

SWEET CLOVER

Sweet clover is adapted over much the same area that is used for alfalfa. It may be used for a hay crop, for pasturage and for increasing the fertility of the soil. The same care should be used in seeding as with alfalfa using about fifteen pounds of seed per acre. Sweet clover is not easily established in run-down pastures or waste land and consequently is not often found except where specially planted. Difficulty is sometimes experienced with the crop being heaved out by alternate freezing and thawing weather in the early spring. This is most common on the heavier clay soils. As the crop lasts but two years it is possible to plow it up after the second crop is taken off and seed to fall wheat. The use of sweet clover is an important means of increasing the nitrogen and organic matter content of the soil.

VETCH

Vetch is not grown very extensively. Fall planted hairy vetch is used to a slight extent in pure seedings but more commonly with fall wheat or rye. When seeded in August it withstands the winter well and makes a heavy growth. It is easier to handle when seeded with a grain crop for hay. Vetch and rye make a greater production than vetch and wheat. The rye however does not make as palatable a feed as wheat hay. When vetch is seeded alone it usually is seeded at the rate of thirty pounds per acre. About the same amount is used when seeded with grain. Rye with vetch is seeded about seventy pounds per acre and wheat with vetch about ninety pounds.

YIELD OF LEGUME HAY CROPS

In the following table are given the average yield of various legumes at the Sandpoint Substation over a period of four years.

Table 6 Showing the Four Year Average Yield of Legumes at the Sandpoint Substation 1923-26.

Variety	Average Acre Yield
Alfalfa	3.5 Tons
White sweet clover	3.8 "
Yellow sweet clover	2.8 "
Medium red clover	2.5 "
Mammoth red clover	3.2 "
Alsike clover	2.4 "
Hairy vetch	1.5 "

METHOD OF SEEDING LEGUMES

The method of seeding legumes is briefly summarized below. It is particularly adapted to seedings on upland soils. On lower more moist soils various modifcations can be substituted.

Fall plowing on cultivated land
Work up seed bed well in early spring
Seed after danger of heavy frost is past
In the case of alfalfa use hardy varieties
Inoculate the seed
Seed without a nurse crop
Rate of seeding: alfalfa 10 pounds, red clover 12 pounds; sweet clover 15 pounds; alsike 6 pounds
Broadcast the seed
Follow seeding with a light harrowing
Roll the land after harrowing

TIMOTHY AND OTHER GRASSES

Timothy has been used very extensively in the cut-over sections. Seed is cheap and together with clover forms a combination that is easy to get established on pasture and range land. It also is well adapted to the low moist soils. When the logging industries were at their peak timothy was an important crop but with the decline of logging or the removal of operations to more distant sections its production has not been found so profitable. Its use is discouraged for several reasons. The yield and value of the crop is low, it is a poor feed for cattle and sheep and the constant growing of timothy seriously depletes the soil of fertility elements essential to the production of other crops.

Other grasses that do well are orchard grass, brome grass, slender wheat grass, meadow fescue, tall meadow oat grass, redtop and Kentucky bluegrass. Bluegrass is commonly found in the pastures with white and alsike clovers. This grass makes very good feed during the spring and early summer months but in most sections fails rapidly after the middle of July. Effort is being made to use some of the other grasses mentioned above to hold up pastures for a longer length of time and also to supply more feed than is furnished by bluegrass.

FALL GRAIN

Fall seeded wheat is one of the best adapted grains of the cut-over lands. Under ordinary conditions the yields are higher in pounds of grain produced per acre than of any other grain crops. Fall wheat is grown generally over all upland soils. It is not adapted to areas that are subject to overflow or to deep peat soils. Other soils that are wet and seepy do not produce well unless the drainage water is taken off. Seeding is done from the middle of August until the latter part of September. The most favorable period is from the middle of August until the forepart of September, as seeding after that time may result in poor stooling and more liklihood of winter killing. Ninety pounds of seed per acre is the standard rate in seeding. Winter killing is not very common except on low areas on which water and ice stand. The fall wheat is usually ready for harvest by the 15th of July. In the table which follows yields are given for the best adapted varieties. Winter barley is not grown to a very large extent because of lack of sufficient winter hardiness. In the five year period from 1923 to 1927

Winter Club barley has averaged 22.6 bushels per acre. Rosen rye in the four year period from 1924 to 1927 has averaged 30.8 bushels and Black Winter emmer in the same period has averaged 26.7 bushels.

Table 7 Showing Average Yields of Fall Wheat Varieties for the Five Year Period of 1923-1927 at the Sandpoint Substation.

Variety	Average Acre Yield
Mosida	29.9 bushels
Hybrid 128	26.2 "
Turkey Red	26.1 "
Jones Fife	25.2 "
Goldcoin	24.5 "
Jenkin	14.3 "

SPRING WHEAT

Spring wheat is best adapted to those sections that have too wet conditions for good growth of fall wheat or in which the cropping system will not permit the early planting necessary for fall wheat. In limited tests spring wheat has not shown to very good advantage on peat soils. Planting ordinarily is done in April after the soil starts to warm up slightly. Seeding usually is done at the rate of ninety pounds per acre. Harvesting takes place about the first of August. The average yield of most prominent varieties over a five year period are given in the following table.

Table 8 Showing the Average Yield of Spring Wheat Varieties at the Sandpoint Substation for the Five Year Period 1923-1927.

Variety	Average Acre Yield
Jenkin	25.5 bushels
Pacific Bluestem	24.3 "
Defiance	21.9 "
Marquis	21.2 "
Early Baart	20.9 "
Federation	20.7 "
Hard Federation	16.5 "

Jenkin is well adapted over a large area but should not be used where the season is short as it requires at 10-14 day longer growing season for maturity than the other varieties.

OATS

Oats are more variable in production on the upland farms than the wheats. Best oat production sections of the cut-over area are found on the peat soils and on other low moist soils. Seeding is done at about the same time as seeding wheat at a rate of 100 pounds per acre. The crop usually is ready for harvest by the last week in July. Average yields of the common varieties are given in the table which follows.

Table 9 Showing the Average Yield of Oat Varieties at the Sandpoint Substation for the Four Year Period 1924-1927.

Variety	Average Acre Yield	
Banner	52.5	bushels
Abundance	51.0	"
Idamine	50.1	"
Silvermine	49.6	"
Markton	49.5	"
Victory	49.0	"
Early Mountain	46.2	"
Regenerated Swedish Select	45.2	"
Side Oats	42.6	"

In a study of variability in oat yields the Banner variety yielded 49.3 bushels in 1924; 83.1 bushels in 1925; 44.9 bushels in 1926 and 32.6 bushels in 1927.

BARLEY

Barley is not grown to any large extent. Beardless varieties are grown occasionally for hay or for hogging off but the most common are the bearded varieties. On the light soils barley does not make a very heavy growth and is oftentimes difficult to handle because of the short straw. On the heavier more fertile soils barley can be used to good advantage and makes good yields. Barley furnishes a good concentrated feed for all classes of livestock and is in demand for such purposes. Some of the varieties grown at the Sandpoint Substation and their average yields are given in the table below.

Table 10 Showing the Average Yield of Barley Varieties at the Sandpoint Substation for the Four Year Period 1924-1927.

Variety	Average Acre Yield
White Smyrna	33.7 bushels
Trebi	31.4 "
Hooded	29.2 "
Winter Club	28.6 "
Han River	28.3 "

Barley is seeded at about the same time of seeding wheat and matures about the middle of July. The rate of seeding is about 100 pounds per acre.

PEAS

Peas may be used for hay or for seed, and in combination with oats or other grain for hay or silage. When grown for hay they form one of the most satisfactory annual hay crops and can be handled with little difficulty. The hay is of excellent quality and well liked by live-stock. When grown for the seed this grain forms a good protein concentrate and the seed is also in demand for planting purposes. The pea straw also is a valuable by-product for roughage. Pea and oat hay is a very good feed for all classes of stock and peas and oats for silage purposes are used in a limited way on areas where the season is too short for the production of other silage crops. It is a valuable silage feed but on most land a greater tonnage can be obtained from either sunflowers or corn. Peas are becoming more extensively grown principally for seed purposes. They are very well adapted on the lower lands and often produce suprisingly large yields. The seed brings a good price from seed companies or from local dealers. For best results peas should be seeded as early in the spring as the land can be prepared. Where peas have not been grown before on the land the seed should be inoculated. Yields of peas for hay have averaged about a ton per acre on the Sandpoint Substation and where grown in combination with other crops a slightly larger yield is obtained. When grown with oats or other grain the crop is somewhat easier to handle with harvesting machinery. The usual rate of seeding peas alone is 120 pounds per acre and when grown with oats the rate of seeding which has given good results has been peas 90 pounds and oats 70 pounds per acre. Peas usually are ripe by the last of July.

In the following table the yields of peas at the Sandpoint Substation for a five year period are given.

Table 11 Showing Average Yields of Pea Varieties at the Sandpoint Substation for the Five Year Period 1923-1927.

Variety	Average Acre Yield	
White Canada	20.0	bushels
Kaiser	19.2	"
Bangalia	16.0	"
Bluebell	15.6	"
Alaska	15.1	"

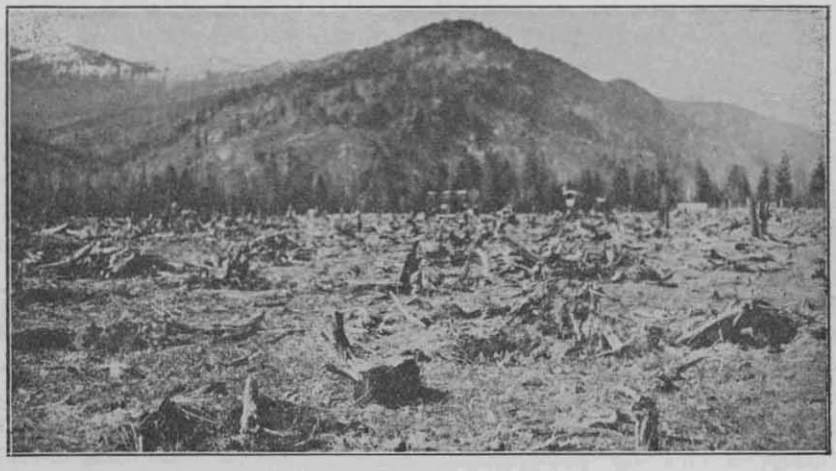

Figure 4. Stumps blasted ready for removal

CORN

Corn is not used to any great extent in the cut-over sections. It is in more general use in the southern and western portions of the area than in any other. The chief hindrances to the growing of corn are the wet cold springs and cool nights during the growing season. Where corn is used locally developed strains of early maturing varieties are found. Some of the varieties that are commonly grown are Rustlers White Dent, Northwestern Dent, Gehu and Minnesota 23. Corn is also used to some extent for silage purposes but in most places it is out-

yielded by sunflowers. In a test to find the relative differences in yielding ability of the two crops at the Sandpoint Substation the average yield for corn for a five year period was 3.8 tons per acre and for sunflowers 11.5 tons.

POTATOES

Potatoes are well adapted to the whole of the region except in the very frosty localities. While production is not very large except on the more fertile soils or where the fertility has been built up by the use of legumes and manures the quality of the product is excellent. Potatoes for the most part are not grown on a very large scale and very seldom do we find more than five acres on a farm. Surplus potatoes usually are handled thru the local markets and in heavier producing sections carload shipments are made to more distant points. Stimulation is being given to the production of a high class of seed potatoes for the irrigated sections of southern Idaho and of Washington. Since this class of production requires more time and effort on the part of the grower than the production of commercial lots the growing of such potatoes finds only limited adaptation. As the markets for good seed stock are developed more general production of seed potatoes can be recommended. Potatoes are ordinarily planted and dug by hand on the smaller acreages but with the larger operators the use of machinery for planting and digging is common. Planting is usually done the middle of May and harvesting takes place about the first of October. Average acre yields are given in the following table for common varieties grown at the Sandpoint Substation for a five year period. The Idaho Rural variety is the best of the late varieties for the upland soils. On lower areas where the soil moisture is more constant the Netted Gem is an excellent late variety. Limited tests with the Bliss Triumph indicates that it may be one of the best of the early varieties.

Table 12 Showing Average Acre Yield of Potatoes at the Sandpoint Substation for the Five Year Period 1923-1927.

Variety	Average Acre Yield
Idaho Rural	6924 pounds
Green Mountain	6212 "
Irish Cobbler	5781 "
Netted Gem	5474 "
Early Ohio	5049 "

ROOT CROPS

On most farms carrots are about the highest yielding of the common root crops. On lower soils or where irrigation can be practiced undoubtedly mangels and half-sugar beets would show up to better advantage. The average yields for this test of the common root crops are given below.

Table 13 Showing the Average Yields of Various Root Crops at the Sandpoint Substation for the Period 1922-1926.

Variety	Average Acre Yield
Carrots	17,240 pounds
Turnips	10,898 "
Mangels	9,279 "
Rutabagas	8,578 "
Sugar beets	8,107 "
Halfsugar beets	6,798 "

MISCELLANEOUS CROPS

Tests are being made continually at the Sandpoint Substation on the performance of the less important or newly introduced crops to find if they have any particular advantage for cut-over conditions. Some of the crops that have been tried but which have not given striking performances are Sanfoin, Hubam, Ladino clover, soy beans, navy beans, flax, buckwheat, winter oats, spring emmer, spring rye, millets, sorghums, Dalea, and artichokes (Jerusalem).

FRUIT AND GARDENING

The production of good quality fruit is general over practically all of the cut-over sections. Heaviest centers of production are in irrigated districts but there are also many commercial producers on other lands. A moist subsoil condition is essential for high yearly production. Care must be made in the selection of orchard land because of danger of frost conditions that may result from poor air drainage. On unirrigated land the size of product is ordinarily not as large as where irrigation is practiced but the quality of the fruit is good and well colored. The most common apple varieties are Delicious, Jonathan, Wealthy, Rome Beauty, Yellow Transparent, Red June and McIntosh. Pears most commonly grown are Bartlett,

Flemish Beauty, Winter Nelis and d'Anjou. Under present conditions the expansion of the commercial apple industry is not to be desired but with pears an increased acreage can be taken care of readily. Most varieties of plums and prunes do well. All varieties of sour cherries seem to do well but in certain sections the sweet cherries kill badly. Peaches are not grown to any extent except in the warmer localities. Small fruits such as raspberries, currants, strawberries and gooseberries are well adapted but if the supply of soil moisture is not constant provision should be made for irrigation during dry seasons.

Certain garden crops find particular adaptation in special sections. The most common kinds are grown generally. As with fruit production best results are had where there is a plentiful supply of moisture. Truck gardening to supply the needs of canneries and the larger markets is being developed in some places. Vegetables can be stored for long periods, a condition that is very beneficial to producers of the various root and garden crops.

FERTILIZERS

Commercial fertilizers have not found a very prominent place among cut-over farmers. Most of the men depend on building up and maintaining the fertility of the soil thru the use of available manure and the use of legumes. Peat soils are the only ones to which very extensive use has been made of commercial products. After the continued cropping of these soils to grass and grain the yields are seriously reduced compared with original plantings. On such lands a mixture of potash and phosphate applied at the rate of 150 pounds per acre usually will result in greatly increased stimulation of the crop.

Most of the upland soils in their original state are not well enough supplied with nitrogen, sulfur, and organic matter to give maximum production. Nitrogen is supplied by the growing of legumes and by the addition of manure. Alfalfa, sweet clover, red and alsike clovers are most commonly used for this purpose and likewise help to build up the organic matter content of the soil.

The use of some form of sulfur on practically all of the upland soils results in increased growth of leguminous crops. Most general use is made of gypsum for this purpose. Gypsum

carries about 18 per cent of sulfur and it is easily obtained at a low cost. The usual rate of application is 200 pounds per acre every three or four years. Largest increases in yield are obtained from its application to perennial legumes and it also has proven of value to meadow seedings which contain a fair proportion of leguminous crops. The most satisfactory time of applying gypsum is in the fall or early spring but it can be put on at any time after the crop is seeded. Spreading gypsum when there is plenty of moisture tends to make the reaction quicker and the sulphur becomes more readily available to the crop.

Lime is not used to any great extent. Most of the forest soils show a distinct acid reaction in the surface soil but the subsoils often are well supplied with lime. Most of the soil types support good production of alfalfa and sweet clover, crops which must have a plentiful supply of lime for good growth. In experiments which have been conducted increases have been obtained from the use of lime on legumes but highest production has been obtained from the use of gypsum.

In the table which follows yields are given from the use of lime, gypsum and phosphorus on hay crops for a five year period at the Sandpoint Substation. The results here presented were obtained from but one initial application of fertilizer which was made to the newly seeded crop in 1921.

Table 14 Showing the Effect on Yield of Several Fertilizers on Various Hay Crops at the Sandpoint Substation for the Five Year Period 1922-1926.

Crop	Average yield in pounds per acre			
	No treatment	Phosphate	Gypsum	Lime
Alfalfa	2898	3515	6159	3716
Sweet clover	1777	2223	3543	2570
Red clover	2255	2400	3300	3120
Alsike clover	1860	2017	2767	2416
Grass mixture	2593	2588	3895	2700
Peas	1433	1480	1778	1807
Vetch	2110	1885	2095	2770

LIVESTOCK

The success and development of any extensive livestock enterprise depends on the abundance and low price of the proper feed stuffs. Most of the areas in northern Idaho have been handicapped in this regard. One of the principle drawbacks to more extensive livestock operations has been that of marked fluctuation in hay production from year to year. The main feeds depended upon were clover and timothy. In years of high rainfall production of hay was good and under adverse conditions the hay supply was short of the local needs necessitating the shipping in of hay from other states. With the rapid increase of alfalfa the hay supply is becoming stabilized and the farmers are finding that they have a more dependable supply of feed and are able to produce a larger tonnage on the same acreage. As the supply of hay increases there is a better prospect of increase in the livestock population. The supply of concentrated feeds is not being taken care of in the same ratio that the hay situation is being solved. There are indications that more grain is being grown each year but many of the farmers feel that they can better afford to purchase shipped in grain than imported hay. The more extensive use of wheat, barley and oats in the seeding systems of the farms undoubtedly will help solve the problem. The carrying capacity of much of the stump land pasture can be increased by a more general use of sweet clover for pasturage purposes or by the more extended useage of the higher producing and more rapidly growing grasses.

DAIRY CATTLE

Dairying is the chief livestock enterprise of the farmers on cut-over lands and furnishes their main cash income. The large area of stump or pasture land on most farms is well utilized thru dairy cattle. On pastures that have not been overgrazed the growth of the native or introduced vegetation usually is abundant and lasts well thru the summer. Where the pastures are overgrazed they ordinarily hold up well until the first of August and then deteriorate rapidly. With the coming of the fall rains, pastures come back. Under good pasture management cattle can run on pasture from the last of April until the first of October and sometimes later, depending on the seasonal conditions. Dairying will improve in direct relation to the increase in the alfalfa acreage. The farmers realize the neces-

sity of marketing the products of the farm thru the medium of animal products.

Interest is being taken in the building up of better herds by the use of better sires and by the disposal of the poorer cows. Several counties have well organized bull associations and many communities are interested in bull club organization. All breeds are represented with certain sections standardizing around one breed. Tuberculosis eradication in cattle has been completed in several counties and others are in line for this work. Creameries are to be found in Boundary, Bonner, Kootenai, Benewah, Latah, Clearwater, Nez Perce and Idaho counties so that the region is well supplied with local markets.

Figure 5. Delayed system of clearing where the land is pastured prior to blasting.

SHEEP

Practically the same condition prevailed with the sheep industry as was mentioned before with dairy cattle. With the increase of alfalfa, interest in sheep production is increasing from year to year and many farmers are finding that a small flock can be handled easily and profitably under cut-over conditions. There are few large bands in northern Idaho. Most of the flocks average between 20 and 50 head of breeding ewes. Sheep find a place in the utilization of the rougher pastures. The pasture season ordinarily extends from the middle of April until the middle of November. Lambing is done between the

middle of February and the last of March. Fences about the pastures and good sheds for lambing are essentials in the handling of sheep. Except in the outlying districts there are no extensive losses from predatory animals. Cooperative herding arrangements have been tried with small units and the plan is meeting with success. Plenty of good range is available for sheep and many herds each season are brought in from the larger sheep districts outside of the state. Sales of lambs are made to local dealers or if the units are large enough shipment is made to larger markets. Wool is sold to local dealers or is shipped to larger buyers or cooperative organizations.

BEEF CATTLE

Farmers that have a plentiful supply of hay and are adjacent to areas of range land are finding the beef cattle business good source of revenue. Range land is found in abundance in most of the counties. This land consists of national forest, state and privately owned areas. There is a wide variation in the grazing capacity of different ranges but much of it is capable of making rapid growth of the stock. The range season is more extended than for dairy cattle and while it is necessary to feed in the winter the amount of hay needed is not excessive. Feeding of grain or other concentrated feeds in fattening cattle is not a general practice. Much of the stock is sold as it comes from the range in fall. Local markets absorb a large proportion of the livestock or shipments of large numbers are made to the larger central markets. Most of the larger units are headed by purebred beef bulls.

Table 15 Showing National Forest Areas in Northern Idaho and the Grazing Land in each Forest.

National Forest	Net National Forest Area	Grazing and Barren Areas
Clearwater	785,000	22,000
Coeur d'Alene	662,000	9,000
Kaniksu	187,000	2,000
Nez Perce	1,659,000	120,000
Pend d'Oreille	675,000	98,000
Selway	1,689,000	18,000
St. Joe	551,000	22,000
Idaho	1,857,000	97,000

HOGS

Hogs are not kept to any great extent except in places where there is an abundance of grain. Many of the men keep a few hogs for the needs of the family and to consume the waste and by-products that accumulate about the farm. Skimmilk, cull potatoes, grain and grain by-products are used most generally for hog feed. In a few places specially planted crops are seeded for hogging down. Peas and barley are best adapted for this purpose. Where large acreages of grain are grown hogs are widely used to go over the fields to make use of the grain lost in harvesting. Alfalfa or clover pasture is frequently used as a roughage for the sows and young pigs. Hogs usually bring good prices in this section but unless there is a plentiful supply of home grown feeds the production of the pork on a market basis is not profitable.

POULTRY

Poultry production like that of dairying furnishes a source of constant income and much interest is manifest in the expansion of small flocks into commercial units. Poultry can be well combined with dairy cattle in the utilization of the skimmilk or buttermilk. With the growth of the dairy industry an expansion of poultry production also can be anticipated. Men engaged in commercial sized units are quick to take advantage of better production and housing practices. A plentiful supply of cheap lumber is available for use in poultry operations. Egg prices are highest from October to January and the product is absorbed in large quantities in the lumbering and mining districts. Mild winters which are inducive to high winter egg production does much to stimulate interest in poultry husbandry.