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Crops to Replace Spring Wheat In Northern Idaho

by

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Soybeans produce excellent yields in the warmer areas.

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Summary

Spring wheat is now a profitable crop in most of northern Idaho.

Barley, oats and peas are good supply crops to replace spring wheat.

Soybeans are adapted to the warmer areas where corn and beans are profitable crops.

Alfalfa, red clover, and alsike clover produce good seed crops in much of northern Idaho.

Many grasses seed abundantly in northern Idaho.

Alfalfa is the recommended hay crop for well drained soils.

Alsike clover, Reeds Canary Grass and Timothy are the best hay crops for the moister soils.

Sweet clover furnishes abundant pasture throughout the growing season.

Excellent stands of grasses and legumes can be secured on newly burned cut-over land.

Crops to Replace Spring Wheat in Northern Idaho

by

H. W. HULBERT*

THE low price of wheat apparently makes it necessary for wheat farmers of northern Idaho to reorganize their farming systems to include other sources of income. This replacement program is best adapted to the acreage now devoted to the production of spring wheat. A survey made by the department of agronomy, College of Agriculture, in 1929 showed that 25.1 per cent of the total wheat crop of northern Idaho, or approximately 70,000 acres, was spring seeded. According to data furnished by Julius H. Jacobson, Crop Statistician, spring wheat in 1929 and 1930 yielded on the average 14.1 bushels per acre less than winter wheat in Latah, Lewis, Nez Perce and Idaho counties.

Eleven years' results with three wheat varieties, seeded both fall and spring, show an increase in yield of nearly 40 per cent from the fall planting. These data are shown in Table I and were secured from the University Farm, Moscow.

TABLE I.

Comparative Effect of Fall and Spring Seeding Upon the Yield of Three Wheat Varieties at Moscow.

Variety	Time of seeding	11 Yr. aver. yields Bushels	Increase from fall seeding bushels	Per cent increase
Jenkin	Fall	54.9		
	Spring	36.9	18.0	48.7
Pacific	Fall	46.3		
	Spring	33.6	12.7	37.8
Marquis	Fall	45.1		
	Spring	34.5	10.6	30.7
Average	Fall	48.8		
	Spring	35.0	13.8	39.4

Winter wheat outyields spring wheat 15 bushels to the acre according to the ten-year average yields of four commonly grown varieties each of winter and spring wheats grown at the Central Experiment Station, Moscow. These data, together with the yields of the better varieties of oats, barley and peas are shown in Table II.

TABLE II.

Comparative Yield of Various Grain Crops Grown at the Idaho Agricultural Experiment Station, Moscow, 1921-1930 Inclusive.

Crop and Variety	Average yields per acre	
	Bushels	Pounds
Winter Barley		
Winter Club	85.1	4085
Winter Wheat		
Triplet	58.1	3486
Mosida	59.2	3552
Hybrid 128	47.8	2868
Fortyfold	48.2	2892
Average	53.3	3199

*Agronomist, Idaho Agricultural Experiment Station.

Spring Wheat

Federation	38.6	2316
Jenkin	38.2	2292
Marquis	36.1	2155
Baart	37.4	2244
Average	37.6	2255

Spring Barley

Trebi	76.5	3672
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Spring Oats

Markton	83.9	2685
Idamine	74.3	2378
Average	79.1	2532

Field Peas

White Canada	26.6	1596
Bluebell	26.7	1602
Average	26.7	1599

Oats and Barley

The data in Table II show that both spring barley and oats are possible grain substitutes for spring wheat. Oats are of considerable value in certain types of livestock rations and if grown should be seeded early in the moister soils. Markton is the outstanding variety from the standpoint of yield. It is also highly resistant to smut and need not be treated before planting. Victory, Idamine, Abundance, and Banner are high yielding, well adapted varieties. In the warmer sections, Richland and Idamine are the best varieties to grow, because of their earliness which allows them to mature before the arrival of hot weather.

Spring barley, because of its greater yield should be grown more extensively than oats. Over a ten-year period it yielded 15 per cent better than winter wheat and nearly 1500 pounds to the acre more than spring wheat. The acreage grown is dependent upon its possible utilization in feeding livestock and the demand upon the local market.

Farmers in general have been prejudiced against spring barley varieties, because the older, commonly grown sorts were short strawed and, in the drier seasons, difficult to harvest. Present day varieties have stiff straw of good length and other desirable characteristics which enable them to be combined the same as wheat. Trebi is the outstanding variety for northern Idaho grain areas and should replace the older spring barleys on farms where the crop is to be grown. Experiments at the Sandpoint Substation show Charlottetown, a two-rowed variety, especially adapted to the cut-over sections.

Winter barley outyields the better spring varieties by a narrow margin and is grown to a considerable extent in many sections of northern Idaho. The crop interferes with the labor requirements of winter wheat seeding and for this reason many farmers prefer to grow spring barley. Winter barley must be seeded early so that it will make enough growth to withstand winter-killing. Moreover,

winter barley is less hardy than winter wheat and cannot be satisfactorily grown every season in the colder sections. Winter Club is the outstanding variety and is extensively grown where the crop is adapted.

Field Peas

Field peas are a satisfactory substitute crop for spring wheat, but at present the acreage should not be materially increased if they are to be used as a cash crop. As a threshed crop for feeding purposes peas are outyielded nearly a ton to the acre by spring barley, which has about the same value, pound for pound, for feeding livestock. Expansion depends more upon the use of peas for "hogging off," or pasturing with hogs or possibly sheep.

In 1920*, hogs pastured on field peas at the University Farm, Moscow, required 515 pounds of peas to produce 100 pounds of pork. With pork at eight cents a pound the peas made a return of \$1.55 a hundred. Using the average yield of peas as shown in Table II, the acre returns of the crop would amount to \$24.80. Barley, producing the yield shown in Table I, would have a feeding value for hogs of \$58.75 an acre. Harvesting costs must be taken from the barley returns to make them comparable with the acre value of peas.

In the feed lot, hogs fed equal amounts of peas and barley made more rapid and cheaper gains and required less feed for each 100 pounds of gain than either of the grains fed alone. The cheapest gains were made by feeding a ration consisting of three parts of barley, one part of peas and five per cent by weight of tannage.

In order to produce maximum yields of peas they must be seeded early on a carefully prepared seedbed. The rate of seeding must necessarily vary depending upon the size of the variety to be used. Some of the more common and better yielding varieties with their rates of seeding are shown in Table III. The rates shown are for the oat side of a force feed drill of the Superior type and are based on carefully re-cleaned seed.

TABLE III.
Rates of Seeding Necessary for Maximum Yields of Pea Varieties.

Variety	Seeds per pound	Rate of seeding	
		Drill set	Pounds per acre
Alaska	2500	8	115
American Wonder	2050	12	155
Bluebell	1950	10	138
Green Admiral	3250	6	90
Horsford	2350	8	125
Kaiser	2150	9	135
Perfection	2100	9	130
Solo	1750	13	170
White Canada	3050	6	100
White Marrowfat	1400	16	175

*Gongwer, R. E., Field Peas for Pork Production. Idaho Agricultural Experiment Station Bul. No. 125.

Soybeans *

Soybeans can be grown instead of peas in the warmer sections where the frost hazard is eliminated by good air drainage. Since they are strictly a warm season crop, soybeans cannot be grown profitably beyond the borders of the present bean growing areas and should be considered only as a supply crop to be utilized locally for feed. Soybeans make an excellent crop to supplement corn in the finishing of hogs, and should be grown extensively only in those sections of northern Idaho where corn is a successful crop.

The culture of soybeans is similar to that required by corn. They should not be seeded until the soil has warmed up thoroughly. Thin seeding—two plants to the hill—inoculation, a well prepared seedbed, and thorough cultivation are essential for satisfactory results.

Careful selection of varieties is necessary if favorable results are to be secured with soybeans. The crop was introduced into the United States from the Orient, and many of the better varieties require from 150 to 175 days for maturity. It is only by careful breeding and selection that early maturing sorts have been developed which are suitable for our conditions. Fifteen varieties were tested at the H. L. Stafford ranch near Lenore, of which eight matured satisfactorily. Minsoy, requiring approximately 110 days for maturity, is undoubtedly the best variety for the higher areas. At the lower elevations Ito San, Wisconsin Black, Ogema, Elton, Soysota, and Chestnut matured satisfactorily. Manchu could be used in the most favored locations or at the lowest elevations. Chestnut is well adapted for hay production because it retains its leaves well as it nears maturity.

Soybeans should be seeded in rows similar to corn and beans and checked at 20 to 24 inches within the row. Two plants to the hill will give the best results. Thicker stands than this result in delayed maturity and in most cases cause the failure of the crop. The crop should be planted about ~~June~~ ^{July} 1 on a well prepared weed-free seedbed. In the lower elevations plantings can be satisfactorily made a week or ten days earlier. In no event should they be planted before the soil has thoroughly warmed up.

The amount of seed required to the acre varies considerably with the size of seed and the variety. Approximately five to eight pounds are required for the average variety seeded in rows.

Inoculation is essential for the success of soybeans. Lack of inoculation apparently delays maturity, development of the plants, and proper filling of the pods.

Sufficient cultivation to keep down weeds is essential for best results with soybeans. The earlier cultivation up to the time the beans are from three to four inches high can be made with a harrow or similar implement. The crop should not be cultivated after the blooming stage as considerable injury may result.

Soybeans for seed can be harvested with a combine providing non-shattering varieties of the crop are used. The grain binder

*Complete directions for handling soybeans can be secured by writing your County Agent or Department of Agronomy, College of Agriculture, Moscow.

harvests the crop satisfactorily. The crop should be harvested when about two-thirds of the pods have ripened, if the grain binder is used. The best quality of hay is secured when the seeds are about half developed. The hay crop may be cut with either a mower or binder.

Numerous trials at experiment stations and by farmers have shown that soybeans have a high value as a feed for hogs, beef cattle, sheep, and poultry. The crop is especially valuable for pasturing-off with hogs. Mr. H. L. Stafford of Lenore has adopted this practice, using the crop as a supplement to corn and wheat. Such a practice eliminated the harvesting of the corn and soybeans and the threshing of the wheat. The hogs made a rapid growth and satisfactory gains.

Alfalfa and Clover Seed

In certain parts of northern Idaho alfalfa, red and alsike clover can be used for seed production. The production of small seeds is a specialized industry and requires careful and painstaking methods for good results. If part of the farm is to be devoted to the production of this type of crop it should be considered a long time program. The farmer should start out with a small acreage and acquaint himself with the careful methods necessary to produce the crop under his particular conditions. After the methods of growing the crop are mastered the acreage can be safely increased with the assurance that it will be a profitable part of the farming business.

Alfalfa seed was produced successfully for the first time at the University Farm, Moscow, in 1925, from unclipped, rather thin row seedings. Since that time, in spite of the variable climatic conditions of the different seasons, profitable seed yields have been obtained each year. Since 1925, the stands used for seed production were plots containing widely spaced plants. The yields secured vary from 250 to 400 pounds of re-cleaned seed to the acre. At 16 cents a pound—the present price to producers—a yield of 165 pounds of alfalfa seed to the acre is equivalent to a 50 bushel wheat crop on this season's market.

Alfalfa seed in northern Idaho must be grown from the first crop and cannot be produced successfully if the plants are clipped. Clipping brings the bloom on during dry, hot weather, causing the blooms to "strip" or drop off.

Stands of alfalfa to be used for seed production must be very thin if maximum seed yields are to be obtained. Hay stands are not satisfactory for seed production and should never be used, unless properly thinned. Seed yields can be secured from row seedings provided the plants are thinned out within the row so that each plant has a foot or two of space. Thin broadcast seedings which allow the individual plants two or three square feet of space make an ideal stand. Hay stands can be made to produce seed by eliminating about 90 per cent of the plants. This can be done by plowing the field and leaving a strip of plants every 18 to 24 inches. After plowing, the field should be harrowed thoroughly to smooth and level it off to facilitate harvesting.

Certified hardy alfalfa, such as Grimm, Cossack, or Hardigan should be used if a new stand is to be seeded, so that one may produce certified seed which brings a better price on the market. New seedlings should be planted in rows or broadcast at the rate of two to three pounds to the acre. Such seedlings should be made on a well prepared seedbed obtained by fall plowing and thorough spring cultivation. Alfalfa should be seeded without a nurse crop as early in the spring as the seedbed can be prepared. The seedbed should be rolled immediately after seeding to facilitate rapid and uniform germination of the seed.

Alfalfa seed cannot be grown in all parts of northern Idaho, and its production should never be attempted in the warmer areas. North of Bonners Ferry on the bench lands several growers have secured outstanding yields. Areas having climatic conditions similar to those found at Moscow should produce profitable yields. Satisfactory seed yields have not been obtained at Sandpoint.

Growers contemplating seed production should start with a small acreage, increasing it as they learn the needs and requirements of the crop when utilized for seed. The production of alfalfa requires careful farming practice and strict adherence to details if success is to be attained.

Red clover seed should be produced from hay stands. Thin stands do not usually produce satisfactorily, because heavy bloom is necessary for maximum seed yields. This crop is generally considered a two year crop, although when used for seed it is often possible to produce a good seed crop the third year. In the cut-over sections of northern Idaho red clover lasts several years, and at Winchester profitable hay yields can be secured for four years before the crop is replaced by volunteer timothy. Seed has not been produced successfully at either Winchester or Sandpoint even though the crop is apparently well adapted to both areas. Yields at the Central Station, Moscow, have varied from 250 to 300 pounds of recleaned seed to the acre.

Red clover seed, like that of alfalfa, must be grown from the first growth. Clipping, even if done before the first crop is ready for hay has proven entirely unsatisfactory. Since red clover is usually not cut for hay until the blooms start turning brown, one can use the crop for either seed or hay, depending upon how well the plants are setting seed when ready to cut for hay. Red clover fields intended for seed production should be kept free from weeds and carefully rogued from other crop plants.

White Dutch clover seeds well in nearly all sections of northern Idaho. It comes in naturally in most of the cut-over sections and produces seed abundantly. The dry weather common to the area retards the development of the vegetative growth and makes the crop a difficult one to harvest. Therefore, it is not an important crop for seed production.

The United States imports large quantities of alsike clover seed each year because there is not enough produced to supply our domestic needs. During the five year period ending in 1929 these imports averaged 7,500,000 pounds annually. Moreover, the smallest seasonal importation was more than 4,000,000 pounds. The price of

the crop to the grower is usually quite good since the import duty is eight cents a pound.

Average yields of three hundred pounds per acre can be secured by farmers in the Clearwater area. This season the price to growers was approximately 16 cents a pound, thus the crop made a gross return of \$48.00 an acre. To secure and equal return from wheat at present prices would require the use of two acres of land.

The method of growing alsike seed that is in general use by farmers is to sow the seed at the rate of four to five pounds an acre in winter wheat, scattering it broadcast over the wheat field on the last snow in the spring. The seed is sufficiently covered for germination by the alternate freezing and thawing of the soil. The wheat crop is removed in the usual way, leaving a stand of clover which produces a seed crop the following year. After the clover seed crop is removed the land is again plowed and seeded to wheat. Ordinarily the third year the clover volunteers, and produces a stand satisfactory for a seed crop the fourth year. Therefore, after the clover once has been established it normally produces a seed crop in alternate years with the wheat. Some growers always add a small amount of clover seed each spring to their winter wheat to insure a profitable stand.

A few growers produce two crops of clover seed to one of wheat. This is not a desirable practice because the second crop is lower in yield and often badly infested with weed seed.

Gypsum applied at the rate of 100 pounds to the acre to the clover in the fall after the removal of the wheat crop materially increases clover seed yields. The cost of this material is approximately one dollar an acre and is a profitable fertilizer to add.

Grass Seed Production

Considerable quantities of grass seeds commonly used for planting purposes in the United States are imported annually from various foreign countries. Many of these grasses produce excellent yields of seed in northern Idaho and a few farmers have grown them with considerable profit. The yields of the re-cleaned seed that have been obtained over a three year average period at the Central Station, Moscow, are shown in Table IV. These data show that brome grass, meadow fescue, slender wheat grass, and the rye grasses produce very well under Palouse conditions. Similar experiments carried on at Winchester have shown that equally good yields can be secured in that section of northern Idaho.

TABLE IV.

Three Year Average Seed Yields Obtained from Grass Varieties Grown at the University Farm, Moscow.

Grass	Yield pounds per acre
Meadow fescue	1165
Perennial rye	914
Brome	787
Slender wheat	766
Italian rye	760
Timothy	436
Orchard	370

Land devoted to the production of grass seeds must be free from weeds and care must be taken to prevent mixtures of the various grasses and other crop plants if high grade seed is to be produced. In some cases special harvesting methods are necessary for handling the seed crop. In any case, available commercial or home cleaning plants are necessary to put the seed in shape for the market.

Flax

A number of farmers have considered flax a possibility for the replacement of spring wheat. Several growers in widely separated sections of northern Idaho have grown the crop but without much success. Results at the University Farm, Moscow, show the crop to be of little value for Palouse conditions. Eleven different varieties were grown in comparative plot tests for a two-year period. The two-year average yields varied from 4 to 9.7 bushels. Considering present prices and the average yield of the best variety, the crop can not be considered of value for the replacement of spring wheat.

If flax is to be grown, seed of one of the wilt resistant varieties should be secured. North Dakota No. 32, Stark and Reserve have given the highest yields at Moscow. For best results the crop should be seeded in the early spring at the rate of 4 to 5 pecks of seed to the acre.

Hay and Pasture Crops

In northern Idaho hay should be grown only as a supply crop for feeding purposes or supplying local market demands. Farmers in this area cannot afford to produce hay for export in competition with the higher yielding irrigated sections. If produced only to supply local needs, the grower produces the crop at an import price. This price is equal to the price of hay in the irrigated areas, plus the cost of transportation from those areas to the local market.

Farmers in all sections of northern Idaho consider alfalfa to be the outstanding hay crop on well drained soils. Yield trials with forage crops at the University Farm, Moscow; Sandpoint Substation, and Winchester show alfalfa to be the highest-yielding hay crop. Grimm alfalfa is the variety best adapted for this section. Yield data comparing Common and Grimm alfalfa are shown in Table V. In addition to its greater yielding ability, Grimm alfalfa is more hardy and longer lived than the common strains. Ladak, Hardigan, and Cossack are other desirable, high yielding strains of hardy alfalfas.

TABLE V.
Comparative Yields of Grimm and Common Alfalfa in Northern Idaho.

	Moscow 8 year average Tons per acre	Winchester 7 year average Tons per acre
Grimm	2.40	2.13
Common	2.11	1.88

Land that is poorly drained is not usually adapted to alfalfa. Alsike clover produces high yields of hay under those conditions. Timothy and alsike or timothy alone is also adapted to the moister mountain valleys. Reeds Canary Grass is grown satisfactorily in the wet locations. Meadow fescue and brome grass are the higher yielding grass varieties adapted for hay production.

Sweet clover, when properly handled, will furnish more pasturage from early spring until late fall than any other grass or leguminous crop.* The crop may be used for pasturing all kinds of livestock; hogs, cattle, horses, and sheep doing equally well upon it.

Growers desiring a grass pasture will find orchard, brome and meadow fescue, seeded together in equal amounts, to be highly satisfactory. This mixture should be seeded early, without a nurse crop, at the rate of 15 pounds to the acre. Two or three pounds of white biennial sweet clover will furnish a valuable addition to this mixture, materially increasing the carrying capacity of the pasture for the first two seasons.

Desirable stands of nearly all grasses and legumes can be secured from seeding newly burned areas in the cut-over sections. Equally good stands are obtained by seeding on the snow in the spring or in the ashes immediately following the fire. Such grass stands add materially to the pasturage value of this land and prevent weed infestation.

*Detailed information upon sweet clover may be secured by writing the Director, Idaho Agricultural Experiment Station, Moscow, for Bulletin No. 147, entitled Sweet Clover—Growing and Handling the Crop in Idaho.

