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Bulletin No. 5 - Best Varieties and Breeds for Wyoming

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Best Varieties and Breeds for Wyoming.

By the Agriculturist and the Horticulturist.

This Bulletin is prepared from experiments on the Station Farms at Lander, Laramie, Saratoga, Sheridan, Sundance and Wheatland, and from answers to Circulars Nos. 1 and 2. Six parts are issued:

I. Laramie Plains, 7,000 feet above sea level.
II. Southern Wyoming, 6,500
III. West Central Wyoming, 5,500
IV. Eastern Wyoming, 5,000
V. Northeastern Wyoming, 4,500
VI. Northern Wyoming, 4,000

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Agricultural Experiment Station.

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The Laramie Plains are situated between the Medicine Bow Mountains on the west and the Laramie Range on the east. From the southern boundary of Wyoming they extend northward about one hundred miles, with an average width between the foothills of about forty miles. From eight thousand feet above sea level on the south, the Plains slope down the valleys of the Big and Little Laramie rivers in Albany County to an altitude of six thousand feet at the water gap in the Laramie Range. Thence rising northwesterly to seven thousand feet on the Rock Creek divide, the Plains follow the Medicine Bow river to its confluence with the North Platte river in Carbon County to reach six thousand feet again. For fifty miles further down the North Platte river, a very similar region extends to the table lands of Natrona County, which have an altitude of about five thousand feet.

This vast region is an undulating Table Land devoid of trees, but covered with a sparse growth of grama, blue stem and buffalo grasses, varied to the north by luxuriant sage brush. The high mountains which surround the Plains are covered to the timber line with pine forests. Above these are the perpetual snows, feeding the rivers which irrigate this region. Narrow leaved cottonwoods
and quaking asp are found in the foothills. The mean summer temperature varies from $50^\circ$ in the southern foothills to $60^\circ$ in the North Platte Valley. Except to the northward, killing frosts occur in May and September, and white frosts in the other summer months. As the annual rainfall is from eight to fourteen inches all crops must be irrigated.

The Laramie Experiment Farm of the Wyoming Experiment Station represents the average soil and climate of the Laramie Plains. From experiments on this Farm, and from answers to a circular letter sent to the farmers and ranchmen of Albany and Natrona Counties, the following varieties of farm crops and breeds of stock are recommended as adapted to this region:

Improved Fyfe, White Russian and Chili spring wheats have done well. Lawrence Fee, of Laramie, has good yields from the Oregon Red. Spring wheat, oats, rye, barley and flax do best drilled in north and south rows, in April, as early as the ground can be prepared. In Natrona County, May winter wheat is a success planted in September. Both winter wheat and winter rye will probably not do so well further south, but are worthy of trial, if drilled early, for fall pasturage, the Kansas Experiment Station having proved that it is beneficial to both grain and animal to pasture all the growth that would be killed by frost. Salter's spring rye yields well and can be cut green like oats for a fattening hay. Excelsior, Welcome and White Russian oats yield enormous crops of heavy grain and nutritious straw. Lionel Sartoris reports good success with the Black Tartarian oats on the Little Laramie. Four and six-rowed barley are successful and the grain cures bright in this dry climate. Both European
and common flax produce plump seed and a long fiber of extra strength. Japanese and Silver Hull buckwheat are well adapted to this cool climate.

Early Scotchman and Canada field peas do well and are the most promising grain food for swine. Artichokes would be a good addition. Allan H. Dick, of Red Buttes, reports a yield of sixty bushels per acre from Early May peas plowed-in in April. C. C. P. Webel, of Natrona, reports a yield of seventy bushels per acre of Yankee Flint corn planted May 1st. On the Laramie Plains field corn will not mature further than roasting ears, but large crops of fodder corn can be raised. Early Amber sorghum, German and African Millets are other good fodder plants. These and all kinds of hay cure so well in this dry air that they are almost as good as green food. The Utah Experiment Station has proved our air-dry corn fodder better than corn ensilage. Corn, Sorghums and Millets should not be planted before May 15th. Klein Wanzleben and Vilmorin sugar beets planted in May yield so well as to justify the building of a sugar factory.

Timothy, alfalfa and red top are the best tame grasses for hay. Orchard grass does well in Natrona County. Timothy may be sown broadcast on a melting snow, or drilled in as early as possible. E. S. R. Boughton, of Cooper, reports three tons per acre from timothy sown on natural sod and flooded. Alfalfa yields five to nine tons per acre in Natrona County, and is best sown with oats, thus gaining one extra crop. The oat stubble and young alfalfa hold the snow for protection the first winter. For this reason the aftermath should never be pastured from young or old alfalfa. But little irrigation
is needed and this should be stopped in time to ripen the alfalfa, thus avoiding winter-killing.

Grade Hereford and Shorthorn cattle are preferred for wintering on the range. It is being found more profitable to winter cattle and horses in fenced pastures, feeding hay during storms. The Ione Land and Cattle Company, at Cooper, raise Hereford cattle in this way, selling three and four-year-olds and fattening in winter with blue stem hay. B. B. Brooks, of Casper, prefers Galloways, selling at three years, and finds alfalfa hay the best fattening winter feed. Shorthorns and Jerseys are preferred for dairy cattle. R. E. Fitch, of Laramie, finds Merinos the most profitable range sheep, and Merinos and Shropshires for mutton, selling wethers at three to five years and ewes at seven years. Chopped corn has been fed with profit to mutton sheep. Native horses are preferred for the range and Normans and Clydes for farm horses. A few Berkshire swine, Cashmere goats and Spanish mules are raised. Rutabagas, sugar beets and carrots are profitably fed to stock in connection with blue stem, alfalfa or timothy hay. In the coldest weather they will freeze while being eaten, but are well adapted to fall and spring feeding. In California sun dried sugar beets have been successfully used in sugar making. The experiment should be tried of sun drying our sugar beets for winter stock food. They could be ground and fed alone or mixed with chopped grain. By using movable fences around part of the field rutabagas may be fed to cattle and sheep without the expense of digging and storing.

A fall crop which is successfully fed in the field in this way in cold countries is rape. Sheep and cattle fatten very rapidly on the rich green leaves. This will be tried by the Experiment Station in 1892.
Owing to the altitude of the Laramie Plains, which take up a large portion of Albany County, their exposure to heavy winds and late frosts, makes it probable that any extensive culture of orchard or tree fruits will not be successful. E. S. R. Boughton, near Cooper, says that the fruit trees which have been tried in that locality have all died, and in his opinion they will not live because of the exposure. It is believed, however, in the more sheltered localities hardy varieties will be more or less successful. The degree of success can only be determined by experiment.

The culture of small fruits is more promising, as they can be protected by covering in winter. Because of our dry, changeable winters, in any part of Wyoming shrubs and vines, excepting, perhaps, currants and gooseberries, should be covered with earth. Strawberries should be mulched. Among garden vegetables the root crops are the most successful, but other hardy crops, as peas, beans, cabbage, etc., do well. Belts of trees for wind-breaks are almost indispensible for all crops, especially fruit. In Laramie, protected by trees and houses, there are several varieties of crabapple trees which look thrifty and are in bearing. A word of caution may be well here regarding the use of water. As a rule crops are irrigated too much. In general it is not best to irrigate until the crops plainly show the need of water. Too much water makes the ground cold, allows so much evaporation that the alkali is left on the surface and retards growth. In the fall, however, before the water is turned out of the ditches, the
ground should be thoroughly soaked for fruits, that they may not dry out during the winter.

In Natrona County where ever water can be had for irrigation, along the sheltered North Platte Valley, all the more hardy fruits and vegetables would succeed as well as in other parts of the State. C. M. Cheney, Freeland, O. K. Garvey and J. A. Whittear, Casper, state that no fruits have been tried in that county.

The following crops and varieties are recommended. Only standard varieties are named and the one considered best is placed first in each case:

**FRUITS.**


**VEGETABLES.**

(From experiments on Laramie Experiment Farm.)

Southern Wyoming averages about 6,500 feet above sea level. This region is represented by the Saratoga Experiment Farm, and its efficient superintendent, John D. Parker, has greatly aided in the preparation of this article. The North Platte river flows northward through Carbon County, between the Sierra Madre and Seminooe Mountains on the west, and the Medicine Bow Range and the Laramie Plains on the east. The mountains are covered with pine and cedar forests, while quaking asp and balsam fir are found on the foot-hills. The copious winter snows melt very slowly in these forests, affording an abundance of water for the many streams which irrigate the valleys. Good hay naturally grows on the bottom lands close to the streams, but the yield is much increased by irrigation. The bench lands forming the divides between the small streams are covered with matted sage brush. This is the most fertile soil, producing heavier crops of hay, grain or vegetables than the bottom lands, but as it costs more to get the water on the bench lands, the latter are little cropped. Larger irrigating canals will soon reach them. The soil near the foothills is a clay loam,
becoming lighter towards the middle of the valleys, where it is sandy. The clay loam seems best for vegetables, but all is deep and fertile. Under the magic touch of irrigation the soil of southern Wyoming produces enormous crops.

The Green river, supplied from streams rising in the Sweetwater and Wind River Mountains, traverses Sweetwater County. This river and its tributaries afford excellent opportunities for the irrigation farmer. The Red Desert and the Bitter Creek Bad Lands are in the northwestern part. The numerous springs of the southern part afford water for the many herds which graze there. The valley of the Little Snake river is famous for its agriculture.

Southern Uinta County is a mountainous region, chiefly devoted to mining and stock-raising. This County is as large as the State of Massachusetts, Sweetwater County is larger than Vermont and Carbon County has about the area of New Jersey. The average summer temperature is about 60 ° F., and the annual rainfall varies from eight to fifteen inches. The chief industries are stock-raising and mining.

The Saratoga Experiment Farm represents the North Platte Valley especially. This valley is larger than the State of Delaware and is well watered, there being a running stream about every seven miles, making farm crops prolific.

From trials made on the Saratoga Experiment Farm in 1891, and from answers to circular letters sent the farmers and ranchmen of Carbon, Sweetwater and South Uinta Counties, the following varieties and breeds are recommended as adapted to Southern Wyoming: White
Russian spring wheat yields a heavy, hard grain, good for milling. Chili, Oregon Red and Velvet Chaff are other good varieties. May winter wheat and Dutch winter rye promise well. Oats yield thirty to fifty bushels per acre, and weigh forty to forty-five pounds per bushel. The varieties preferred are: Welcome, Black Spanish, Bonanza, Iowa and Side. Four-Rowed spring barley and Okshott’s winter barley do well. European and common flax are successful, withstanding heavy frost. Both Japanese and Silver Hull buckwheat yield well, and the grain is very heavy and well adapted for flour. Canadian and Early Scotchman field peas produce large yields of a good grain stock feed, which, with the grains above, must supply the place of field corn, as the latter does not mature in this region. All of the above spring crops should be planted as early as the ground can be prepared. Corn fodder, sorghum fodder and millet cure very rich in this dry air. The Klein Wanzleben sugar beet yields seventeen tons per acre, and analyzes 16 per cent. of sugar. The best root crops for stock are rutabagas, carrots, sugar beets and artichokes. The popular breeds of poultry are Plymouth Rocks and Brown Leghorns for eggs.

The best tame grasses for hay are timothy, alfalfa and red-top. The best wild grasses for hay are blue stem, wild red-top and wire grass, all well irrigated. Red-top and alfalfa make good tame pasture. Maurice Groshon, of Ft. Bridger, has good timothy planted on sod and flooded. J. S. Teninger, of Ham’s Fork, seeds timothy and red-top together. M. Jones, of Calf Creek, finds wild pasture improved by thorough irrigation late in the fall. J. C. Brewer, of Saratoga, finds alfalfa and timothy very profitable crops.
For twenty years cattle raising has been the principal business of Southern Wyoming. Within the last five years the cattle business has decreased in a like ratio to the increase of sheep-raising and farming. The tendency has been to improve the breed. For general purposes the Shorthorn seems to be the favorite, although the Polled Angus and the Herefords are popular. F. H. Williams, of Saratoga, finds Texans most profitable on the range, selling at three years. Harry Wood, of Ham's Fork, prefers Herefords, and sells at three and four. C. W. Holden, of Fontenelle, sells at the same age, but finds grade Shorthorns best for the range. S. L. Rhodes, of Saratoga, prefers the Aberdeen, and fattens in winter on hay and turnips. E. J. Fouts, of Saratoga, fattens his Herefords and Galloways on hay, beets and rutabagas in winter. Most of the cattle are fattened on grass. Jersey and Shorthorn are the best dairy cattle.

The profits of sheep growing are very great, and it is doubtless the most desirable business in this region. The sheep live the entire year with no other feed than what they get on the range. They are not fed, even in the hardest storms, but are watched by a herder, who lives in a covered "sheep wagon," and moves the herd from range to range. Grade Merinos and Shropshires have proved the most profitable. C. B. Sears, of Black Buttes, finds French Merinos best, selling wethers from two to four years, and ewes from six to eight. He finds alfalfa the most profitable feed for fattening mutton sheep.

Southern Wyoming is especially adapted to breeding and maturing horses. The light air and the hilly country develop sound lungs and a good hoof. Clydesdale, Norman, Percheron and Belgian are popular shipping breeds. For home use these horses are not so useful as a lighter animal. The long distances between ranches, or to the towns, make it absolutely necessary for the Wyoming ranchman to pay more attention to breeding for speed and wind than for weight and strength.
The following statements and recommendations were taken from and suggested by answers to Circular No. 2, data having been kindly furnished by the following persons: C. B. Sears, Black Butte; R. Brackenburg, S. G. Clark, Carbon; A. Bistorious, F. Herman, Elk Mountain; A. A. Bailey, Evanston; M. Groshon, Ft. Bridger; H. Wood, Ham's Fork; Wm. Taylor, Rock Creek; J. W. Gates, A. Kendall, P. J. Quealey, Rock Springs; H. Bridges, H. W. Haines, Jones & Williams, S. L. Rhodes, Saratoga.

J. D. Parker, Superintendent of the Saratoga Experiment Farm, writes: "In the line of fruit raising little has been done in this vicinity. Currants, gooseberries and strawberries are about all the fruits cultivated here. It is only in the last few years that any attempt has been made to raise garden vegetables." Mr. Quealey says: "The production of garden vegetables for ranch use covers the extent of our operations here in Shirley Basin, Carbon county. The vegetable products consist principally of small garden stuff and root crops." Dr. Clark, of Carbon, states that some are experimenting with apples, and in favorable localities with considerable success. He also says: "In narrow valleys, and places sheltered by mountains, fine tomatoes, cucumbers, melons and eggplants have come to perfection."

At Rawlins, Rock Creek and Evanston no fruits have been tried and vegetables are not grown extensively. At the other places, however, a number have been tried. Currants, gooseberries, strawberries, and those fruits which
can be covered with earth for winter protection, as blackberries and raspberries, do best. Among vegetables the root crops are the most successful, though all are matured in some localities. In all elevated places care should be taken not to irrigate too much. More water than is absolutely necessary is apt to make the soil cold and retard growth.

The following varieties are recommended for planting and further trial:

**FRUITS.**


**GARDEN VEGETABLES.**

The agricultural portions of West-Central Wyoming are the table lands, the mountain basins, and the valleys. This region is represented by the Lander Experiment Farm. The able Superintendent, Jacob S. Meyer, has given much assistance in the preparation of this article. The mountain basins range from 3,500 feet above sea level on the Big Horn river, to 5,500 feet at the heads of the Wind and Green rivers, and are surrounded by mountains from 7,000 to 13,500 feet high. Below 10,000 feet these peaks are covered with dense forests of pine, spruce and fir, and above these are the perpetual snows which supply the clear water to the many streams which irrigate the beautiful valleys of the basins.

The table-lands comprise the greater part of the arable ground, and consist of first and second benches, which vary from gently rolling prairies to broken hills, bluffs and canyons. Though not so fertile as the bottom lands of the mountain valleys, the benches produce better fruits, and all crops thrive well in the durable soil. The river bottoms have a sandy alluvial soil. The first benches have less alluvium, but more sand, gravel and clay. The second and third benches are covered with clay, sand and gravel loams. The soils are exceptionally rich in grain-
producing elements, and the continuous supply of irrigation water from the mountain streams is laden with those minerals specially useful to vegetables and cereals. A total failure of crops is unknown. The Lander Experiment Farm is mainly on the first bench of the table land, containing only a small portion of the bottom land skirting the Big PopoAgie river.

In Northwestern Wyoming is the famous Yellowstone National Park, containing the headwaters of the Yellowstone river. To the south of the Park is the upper valley of the Snake river in Northern Uinta County. The Sweetwater river flows east through a sandy valley in Southern Fremont County. Big Horn and Fremont Counties contain the great valley of the Big Horn river and its tributaries, the Stinkingwater, the Grey Bull, the Painted Rock, the Wind, and the PopoAgie rivers.

The average summer temperature is about 60° F. and the annual rainfall about twelve inches. Irrigation is necessary. The winters are generally short, with sunny days and clear nights. But little snow falls before Christmas. The air is so dry that even when the mercury falls to 40° below zero, lumbermen, freighters and hunters work and camp out doors with comfort. Two or three feet of warm snow falls in April and May, sprouting and quickening the spring crops. Heavy snowfalls in May are sure harbingers of large crops, and of good grass on the range. A snowless spring causes much labor in irrigating up the planted crops, and is generally followed by smaller yields and shorter grass on the range. The melting of the mountain snows causes river floods in June and July. Grain is harvested in August and September. A deep October snowfall presages two or three months of Indian
Summer weather. Snow lies on the ground so short a time that there is very little sleighing, and stock live outdoors all winter on the sun-cured grass.

The following varieties and breeds are recommended for West-Central Wyoming. This judgment is made from the crops grown on the Lander Experiment Farm in 1891, and from answers to circular letters sent to the farmers and ranchmen of Fremont, Big Horn and Northern Uinta counties.

Of spring wheats, the White Touse, White Club and Scotch Fyfe are grown most. A. P. Battrum, of Lander, finds it best to sow a mixture of Touse and Club. He reports a yield of White Touse of sixty bushels per acre. The usual yield is twenty-five to forty bushels per acre, of heavy, hard wheat. May winter wheat does well planted early in September. Both spring and winter rye are successful, making good stock food. The White Russian, Welcome and American Banner oats are the most popular. The yield per acre is from thirty-five to eighty bushels, weighing forty to forty-six pounds per bushel. Mr. Battrum grew seventy-two bushels per acre of Golden Giant Side oats. Chas. Wells, of Red Bank, prefers the White Siberian variety. Four and Six-Rowed barley and Okshott's winter barley are well adapted to this region, yielding from forty to sixty bushels per acre. Canada field peas do well. European and Russian flax are reported successful. Both common and Japanese buckwheat yield well. White Navy beans ripen thoroughly.

Only the hardier varieties of corn are grown in the valleys under the Continental Divide. But in the valleys of the Big Horn, Owl Creek and Stinking Water, Missouri
Dent corn matures every year, yielding sixty bushels to the acre. F. S. Wood, of Otto, finds the Early Dent successful. Sod corn on the Grey Bull river has yielded forty bushels per acre. Yellow Canada Flint makes a good fodder corn. Pride of the North and Minnesota King do well. Early Amber is the best fodder sorghum. German millet is an excellent forage plant. The best tame grasses for hay are alfalfa, timothy and red-top. John Kimpel, of Lander sows alfalfa and timothy with spring wheat. Alfalfa does well sown with oats. J. J. Frey, of Lander, seeds red-top on the snow in early spring. The blue stem and blue joint are the best wild grasses for hay. They should be thoroughly irrigated, and are often benefited by manure. The best tame grasses for pasture are red-top, alfalfa and timothy.

Rutabagas, sugar beets, carrots and artichokes are good root crops for stock. The sugar beets yield a high percentage of sugar.

Cattle do well on the range, the loss being very small. The Shorthorn and Polled Angus are popular breeds. Robert McAuley, of Atlantic City, and Otto Frame, of Arland, prefer grade Herefords for the range. J. A. McAvoy, of Lander, prefers Devons for all purposes, and fattens them in winter on alfalfa, carrots and rutabagas. The Jerseys and Shorthorns are the most popular dairy cattle. Merino and Shropshire sheep do well on the range.

Morgan and Hambletonian horses are the best for the range, and for all purpose horses. For farm horses, Normans, Clydes and Morgans are about equally popular.

Poland China and Berkshire swine do well if fed in summer on alfalfa pasture, and in winter on peas, barley and artichokes.

Nearly all farm crops are successful in this region.
The following persons have kindly answered and returned Circular No. 2: E. Young, Dallas; A. P. Battum, Chas. Edwards, Mrs. M. A. Mason, J. A. McAvoy, Lander; F. S. Tweed, Otto.

J. S. Meyer, superintendent of the Lander Experiment Farm, writes as follows: “In the spring of 1882 I set out sixty apple trees. The following winter these all turned black on the side toward the west, and died down to the roots. In 1885 I again set out twenty-four trees. These did well, and were it not for the rabbits, which killed the larger part of the trees, I would at present have a nice little orchard. One of the trees sprouted out above the graft, and in five years produced one-half bushel of fruit. Excepting grapes, all small fruits do well here. Twenty-five gallons of berries were produced by my blackberry bushes this year. The bushes have to be covered with earth to protect them during the winter. I believe it is only a matter of a few years until this valley will produce its own apples and small fruits. Some kind of protection is necessary on the north and west. Apples should be set out on uplands, i.e., on the first or second bench above the river.”

Mr. Young, of Dallas, says: “My trees have been overloaded for two years, and have not winter-killed. I have some Russian varieties of great promise. Small fruits need winter protection.”

Although but little has been done in this section as yet, the experiments which have been carried out, and are under way, prove beyond a doubt that well directed effort
in raising vegetables and fruits will be well repaid. Irrigation is necessary, except on the river bottoms. The soil is very productive, crops grow to a large size and yield heavily. From answers to the circular, the following varieties are recommended for planting and further trial:

FRUITS.


GARDEN VEGETABLES.

The agricultural portions of Eastern Wyoming vary from 4,000 to 6,000 feet above sea level. This part of the State is represented by the Wheatland Experiment Farm. The capable superintendent, Martin R. Johnston, has assisted in writing this article. The portion of Wyoming here described comprises Laramie and Converse Counties. The general surface is a rolling prairie, interspersed with river and creek valleys, with extensive level divides between. It is a continuation of the Great Plains country of Western Nebraska and Kansas, with many of its characteristics. To the west is the Laramie Range, the first great foot-hills of the Rocky Mountains. To the northeast the land rises toward the Black Hills. Between these elevations the North Platte river flows southeast through the middle of this region, receiving, near the center, the Laramie river, which waters the Laramie Plains to the west and above the Laramie Range.

The climate is temperate and healthful. The average summer temperature is about 60°F. The annual rainfall is about fourteen inches. The spring rains are sufficient to start all crops, but summer irrigation is necessary. The nights are cool, with frosts till the middle of May, but the summer is warm. Killing frosts occur about
October 1st. The soil is very fertile. Red and black sandy loams predominate.

Pine trees are found on the summit of the Laramie Range, quaking aspen and cedar lower down, and narrow-leaved cottonwood, box elder and broad-leaved cottonwood along the prairie streams. The prairies are covered with nutritious blue stem, grama, buffalo, and bunch grasses. This region is a famous grazing country, being well watered by the never-failing streams, which rise in the many springs of the Laramie Range. The warm, long summer renders it an excellent agricultural region.

Experiments tried on the Wheatland Experiment Farm in 1891, and answers to circular letters sent to farmers and ranchmen of Laramie and Converse Counties, are the basis for recommending the following varieties of farm crops and breeds of stock, as adapted to Eastern Wyoming:

The Ruby, the White Russian and the Italian varieties of spring wheat have proved successful. Plant in April, or earlier, if the ground can be prepared. A. A. Spaugh, of Manville, raises the Italian spring wheat. The Fultz and Slosson winter wheats have proved best. Plant in August or September, and best in drills which shelter the young plants from the dry winter winds. The usual yield of wheat is from twenty to forty bushels per acre. Salter’s spring rye and German winter rye do well, the latter furnishing good fall pasture. Oats yield especially well, the White Russian, White Swedish and American Wonder being preferred. Colin Macdougall, of Bordeaux, prefers the Mane oats, planting in April. Oats planted late in the fall remain dry in the ground, ready to be sprouted by the earliest spring rains. Both Four and
Six-Rowed barley are successful. Okshott’s winter barley is worthy of trial. Both European and common flax do well, as would be expected from the luxuriance of the wild flax. Japanese and Silver Hull buckwheat are good varieties. Canada field peas yield heavy crops of grain. The White Lima and White Navy beans produce profitable crops.

Field corn matures well, the grain and fodder being the best fattening food for stock. The earlier varieties should be planted, as, Angel of Midnight, Early Mastodon Pride of the North and Whitley Dent. Corn should be planted about the middle of May. The white and yellow Dent and the white Ensilage are the best varieties for corn fodder. Duncan Grant, of Two Bar, has successfully raised Kaffir corn and Millo maize for fodder. Early Amber sorghum is one of the best plants for fodder. German millet is a deservedly popular forage plant in this region.

The best tame grasses for hay are alfalfa, timothy and red-top. Alfalfa does well sown with oats, in April. The oats yield a good crop, and the stubble protects the young clover during the winter. After the first year three crops may be cut each season, making the annual yield from six to nine tons of nutritious hay. W. F. Macfarlane, of Glendo, finds that timothy does well planted on sod, in April. Red-top is reported as succeeding when treated in this manner.

The best wild grasses for hay are blue stem and grama, well irrigated. The best tame grasses for pasture are red clover and alfalfa. The best wild grasses for pasture are the grama, blue stem and buffalo.

Among the root crops which can be successfully
raised for stock are rutabagas, sugar beets, mangolds, carrots and artichokes. The Improved Vilmorin sugar beet has yielded seven tons of beets, analyzing 23 per cent. of sugar. Much larger yields are reported having a good percentage of sugar.

Stock-growing is the great industry of Eastern Wyoming. The excellent summer pasture develops and fattens the stock at little expense. On this natural-cured hay the stock pasture through the winter, being fed in the worst storms. The most popular breed of cattle is the Hereford. John Steele, of Hat Creek, finds that these sell well at two years. Patrick Mullin, of Uva, prefers grade Shorthorns, selling from three to four years. W. A. Watrous, of Wheatland, writes that the Devons mature early, fatten easily and are prolific breeders. Crossed with the Shorthorn he considers them the best for all purpose cattle. Holsteins and Shorthorns are considered the best cattle for dairy purposes.

For both range and pasture sheep, the Merino and Shropshire take the lead.

The Norman horses are most popular for the range, though the lighter breeds are much raised. Normans and Clydes are the best farm horses. Chester White and Poland China swine do well fed in summer on alfalfa, and in winter on corn and cooked roots.

As the range is becoming overcrowded, it is found more and more difficult to fatten stock for market on grass. Formerly the cattle could get enough of the rich grass seeds of the blue stem and oryzopsis to fatten them. This now needs to be supplied by some grain feed. Though many cattle are driven to the corn fields of Nebraska for fattening, it will probably pay better to fatten at home on corn and corn fodder, roots, chopped grain and alfalfa and blue stem hay.
Best Varieties and Breeds for Eastern Wyoming.

HORTICULTURE.

B. C. BUFFUM, B. S.

Answers to Circular No. 2 have been kindly returned by the following persons: C. Macdougall, Bordeaux; Al Bowie, F. E. Ferguson, Wm. Taylor, Chugwater; John Storrel, Douglas; S. Doty, F. Knadt, Ft. Laramie; W. F. Macfarlane, John Moran, Glendo; W. A. Briney, Glenrock; Davidson Bros., Iron Mountain; M. J. Goodwin, Lusk; J. N. Blackwell, S. J. Hedrick, Lakeview; C. J. McLaughlin, Orin Junction; J. H. Gordon, South Bend; Duncan Grant, Two Bar; P. Mullin, Uva; M. R. Johnston, R. Nelson, W. A. Watrous, Wheatland.

As is true in all parts of the State, a large portion of this section is covered with scattered ranches, and until recently little or no attention has been given to raising fruits. Experiments which have been made indicate that no small degree of success with fruits and vegetables will follow where the proper cultivation and care are given.

Mr. Gordon writes: “I am fully persuaded that all fruits which can be grown in Northern Colorado can be grown in this section, provided the same care and attention is given.” At the Wheatland Experiment Farm, in addition to the more hardy crops, tomatoes, and even peanuts, have been successfully raised. Mr. Lusk, at Lusk, has a number of varieties of apples which are doing nicely, and small fruits succeed well. In addition to the usual rules for planting and cultivating fruits, the following are suggested: 1. Late in the fall irrigate all fruits thoroughly to prevent their drying out during the winter. 2. Mulch all trees for winter, taking care not to let the mulch lie
directly against the bark of the tree. 3. Cover the tender shrubs, as raspberries, blackberries and grapes, with earth, for winter protection. Mulch strawberries.

The following varieties are recommended:

**FRUITS.**


**GARDEN VEGETABLES.**

Northeastern Wyoming is from 4,000 to 5,000 feet above sea level. Agricultural experiments for this region are tried on the Sundance Experiment Farm. The energetic Superintendent, Thomas A. Dunn, has written the descriptive portions of this article. The surface of Crook and Weston counties is diversified. To the east are the wooded elevations of the Black Hills. To the west is a prairie country whose low hills are sparsely covered with pines. This entire Black Hills region is drained on the south by the Cheyenne river and on the north by the Belle Fourche, with their numerous tributaries. The eastern foot-hills are covered with superior pine timber. The wash from the mountain sides makes the soil of the mountain parks and valleys very fertile. This constitutes the black loam of the mesas or mountain table lands. At the base of the mesas are found the fertile red gypsum soils. To the west and south is found the rich loamy soil of the sage brush lands. Artificial irrigation is necessary only in the regions with sage brush land. This soil is well adapted to grain and sugar beets. The gypsum in the red soils so well retains the moisture of the spring rains that crops grow freely throughout the summer. This soil is similar to that of the famous Rhine valley. The black loams are similar to those of the Mississippi valley, being
equally productive. They are formed by adding decomposed vegetable matter to the red soils, and in this are similar to the prairie soils of the Great Plains, being equally able to withstand drouth.

The average summer temperature is $60^\circ$ F., and the annual rainfall is about 17 inches. Most of the rain falls in spring and early summer, the autumn being dry. The growing season is long enough to mature corn and all small grains. The sunshine of the many bright days develops all crops, and adds much to the success of the farmer.

Pine, burr-oak and white elm suitable for lumber and fuel grow on the hills. Along the streams and the canyons are found black and white spruce, white birch, boxelder, broad-leaved cottonwood and willow. Wild fruits are abundant. The soil of the Sundance Experiment Farm is fairly typical of the soils of Crook and Weston Counties, being a red gypsum largely washed from surrounding hills. As it is similar to the valley land of these counties, it is well adapted to represent the different phases of farming in Northeastern Wyoming. As irrigation is not general in this region, it will not be practiced on the Farm.

The following varieties of farm crops and breeds of stock are recommended as adapted to Northeastern Wyoming. This selection is based on the Sundance Experiment Farm trials of 1891, and on answers to circular letters sent to the farmers of Crook and Weston Counties.

Yields of upwards of fifty-five bushels per acre of spring wheat are not infrequent. The best varieties are Improved Fyfe, Niagara and Red Oregon. S. H. C. Kent, of Carlile, has good success with Red Chaff. May and Fultz winter wheats promise well. H. C. Manken, of
Eothen, finds the Wild Goose spring rye very successful. Black winter rye yields well and furnishes good fall pasture. John Pearson, of Eothen, reports a yield of 41 bushels per acre. He writes that if sown any time during the fall or winter it will head the next summer, but if sown in the spring it furnishes only pasture the first year. Oats have yielded 100 bushels per acre. The most popular varieties are Welcome, American Banner, White Russian and Siberian. DeSoto E. Richardson, of Sundance, has good success with the Mammoth, planted in April. E. L. Burke, of the Devil's Tower, cuts his oats for fodder and reports a yield of four tons per acre. Six rowed spring barley is successful. Wm. Van Gundy, of Inyan Kara, reports Okshott's winter barley as doing well, planted August 15th. European and Russian are the best varieties of flax. Japanese buckwheat is a good crop. Canada Golden Vine field peas yield well. Thomas P. Sweet, of Newcastle, reports good success with Alaska field peas planted in April. White Navy beans are the best for a field crop.

The successful raising of field corn is a certainty, and the yields compare favorably with some of the famous corn belts. Flint, Yellow Dent, Pride of the North, Squaw and Mandan are the preferred varieties. F. J. C. Mackenzie, of Sundance, plants his Flint corn at the budding of the oaks. The Dent varieties are the best for fodder. Early Amber and Kaffir sorghum, and German and African millets are also good for fodder.

The best tame grasses for hay are timothy, alfalfa, red clover, orchard and Johnson grasses. Ward Brown, of Forks, reports good success with orchard grass planted in April. The best wild grasses for hay are blue joint,
blue stem, grama, and wheat grasses. The most popular tame grasses for pasture are timothy and clover, and Johnson grass. Of the wild grasses, buffalo, blue joint and grama furnish the best pasture. Among the good root crops for stock are rutabagas, sugar beets, mangolds, carrots and turnips. L. M. Hulett, of Hulett, reports carrots as doing well. The Simon La Grande sugar beet yielded six tons of beets analyzing 20 per cent. of sugar.

Stock raising is an important industry. The dry falls cure the nutritious grasses on the ground for use in winter range and pasture feeding. Grade Hereford, Short-horn and Polled Angus are the most popular breeds of cattle. S. A. Young, of Inyan Kara, raises Herefords, selling at four years old. John G. Bunney, of Forks, prefers grade Herefords and sells at four years. Holstein, Jersey, Roan Hereford and Ayreshire cattle are used for dairy purposes. For range sheep, Southdown and Merinos are preferred. Shropshires do well in pastures.

Morgan and Norman horses are popular. Burke and Mackenzie, of the Currycomb Ranch, write: "Our mares are mostly well graded western stock. We are breeding them to imported Suffolk stallions. Our imported Suffolk mares required very little feeding last winter and appear to take kindly to range life in this climate." LeRoy G. Hoyt, of Beulah, has good success with American horses. Berkshire and Poland China swine do well fed in summer on alfalfa pasture and artichokes, and in winter on corn and chopped feed. A. D. Brown, of Forks, feeds cooked sugar beets to his Berkshire. Leghorn and Plymouth Rock hens, Bronze turkeys, ducks and geese are profitable. Farming in Northeastern Wyoming has been demonstrated a success.
The following persons in Crook and Weston Counties have kindly answered and returned Circular No. 2: C. C. Ripley, Beulah; John Parsons, Eothen; E. C. Hall, Gillette; J. P. Bush, L. M. Hulett, Hulett; Wm. Van Gundy, S. A. Young, Inyan Kara; Thos. P. Sweet, Newcastle; J. H. Baxter, Riverdale; J. A. Banguess, F. C. Mackenzie, D. E. Richardson, R. H. Williams, Sundance.

In speaking of fruits, Mr. Williams writes: "Apples and crabs seem to be doing well, also dewberries and grapes. There are wet places in the hills where the cranberry grows well. Raspberries, currants and gooseberries are successful, but blackberries I have no faith in, unless special care is taken, as the canes freeze down every winter." Others have made the same complaint. There is but one remedy, i.e., winter protection. To successfully raise raspberries, blackberries and grapes, in nearly all parts of the State they must be bent to the ground and covered with earth in the fall for protection through the winter.

From the experiments made with fruits, the outlook is very promising. The soil is unusually productive, vegetables of great size being reported. Thos. A. Dunn, superintendent of the Sundance Experiment Farm, says: "A proof of the adaptability of this section to anything in the vegetable line is found in the fact that the sweet potato has been raised successfully in several parts of Crook County.

While irrigation is not always necessary, it is beneficial. Mr. E. Hall writes: "The use of water makes an astonishing change in the growth and vigor of all crops."
The most unpromising soil will yield without stint upon the application of water."

From the answers given to the circular the following varieties are recommended:

**FRUITS.**


**GARDEN VEGETABLES.**

Northern Wyoming is about 4,000 feet above the level of the sea. The fertile valleys of the Tongue and Powder rivers are represented by the Sheridan Experiment Farm. The efficient superintendent, James A. Becker, has written the descriptive portion of this article. The western part of Sheridan and Johnson Counties is crossed by the Big Horn Mountains. At the foot of the eastern slope, in the fertile valleys of the many mountain streams, lies one of the best agricultural regions of Wyoming. As the distance from the mountains increases, the country becomes more rugged, merging into the Bad Lands. Barely more than the narrow valleys is at present cultivated, but with the extensive ditches now being constructed, a large portion of the fertile hills and divides will be farmed. The soil of the valleys is usually a dark, sandy loam, unexcelled in fertility. On the uplands the soil is usually of a lighter color, sometimes consisting of a coarse gravel or a yellowish gumbo clay.

The climate is peculiar, differing greatly within a few miles. The average summer temperature is about 65 ° F. The rainfall is light, except near the mountains. About twelve inches of rain falls yearly, mostly in the early summer. Summer irrigation is necessary. The atmosphere is dry and invigorating. Northwest winds prevail.
are sudden changes of weather and local hail storms near the mountains.

The principal forest trees are broad-leaved cottonwood, box-elder, ash and willow. Wild cherry and plum, and chaparelle or buffalo berry, grow in the valleys.

In 1891 sugar beets yielded 10.7 tons per acre, analyzing 18 per cent. of sugar. This yield per acre can be easily doubled without loss in sugar content. Sorghum promises well. Early corn matures well.

The fertility of soil is unsurpassed, the crops of roots and grains being enormous. In 1890 W. A. Sturgis, of Buffalo, harvested 974 bushels and forty-eight pounds of potatoes from a measured acre. In 1891 S. D. Hays, of Big Horn, on part of an acre grew a yield of potatoes equal to 975 bushels per acre. These gentlemen won the 1890 and 1891 prizes offered by the American Agriculturist for the largest potato yield in America. John Blake, of Beckton, has raised 126 bushels of oats per acre. T. R. Dana, of Pass Creek, has harvested sixty bushels of wheat per acre.

Winter wheat has been grown successfully, but the millers claim the kernels are too soft to make good flour. It is a surer crop than spring wheat in dry years, as it matures before the snow on the mountains is melted. As it requires less irrigation, and furnishes good fall pasture, the Sheridan Experiment Farm will make trials of hard winter wheats.

From trials in 1891 on the Sheridan Experiment Farm, and from answers to circular letters sent the farmers of Sheridan and Johnson Counties, the following varieties of farm crops and breeds of stock are recommended as adapted to Northern Wyoming:
The best varieties of spring wheat are Scotch Fyfe, Sawatchkan, Reliance, Club and Amber. Alfred A. Lambrigger, of Big Horn, reports a yield of eighty-eight bushels per acre of Amber spring wheat. George Ohlman, of Ohlman, has good yields of May winter wheat planted in September. The Giant and the Dutch spring rye are reported successful. Winter rye makes good fall pasture, and yields enormously. The preferred varieties of oats are White Russian, Welcome, White Dutch, Early Dakota and Black Tartarian. L. B. Dewey, of Banner, prefers the Welcome. Brewer's Two and Four-Rowed and Manshury spring barley yield a heavy crop of bright curing grain. Okshott's winter barley promises well.

Where wild flax flourishes so well, the European and common varieties should succeed. Japanese and Silver Hull buckwheat are the best. J. M. Works, of Sheridan, reports good success with Canada Marrowfat and Morning Star field peas. White Navy and Bush Lima are reported the best field beans.

Field corn matures well. The preferred varieties are: Yellow Dent, Wyoming, Ninety-Day, Mandan and Squaw. Joe Harper, of Banner, plants Yellow Dent and Ninety-Day on May 1st. Dent, Squaw and Sweet corn are recommended for fodder. Early Amber sorghum and German millet make good fodder. The best grasses for tame hay are: Alfalfa, Timothy, Red Clover and Orchard Grass. H. W. Davis, of Powder river, planted alfalfa with oats. The oats yielded even better than usual, and the alfalfa did as well as that planted alone. Alfalfa can be winter-killed by late pasturing or irrigating. The best wild hay is blue stem and blue joint. The best tame pasture is alfalfa and timothy. The successful root crops
for stock are: Rutabagas, sugar beets, mangolds and carrots.

The Shorthorns and Herefords are preferred for range cattle. H. W. Davis, of Powder river, writes: "I have had several years experience with the Sussex cattle, and believe that for our short grass, and other conditions, this is the best breed." Luke Voorhees, of the same place, has found the West Highlands well adapted to range purposes.

The Jerseys, Shorthorns, Holsteins and Ayreshires are preferred for the dairy. J. F. Brown, of Landgrove, a dairy farmer of twenty-five years' experience, finds the best all-purpose cow in a cross between the Jersey and the good milking strains of Shorthorn.

Merino and Southdown sheep are preferred for the range. The Oxfords do well in pastures. John A. Moore, of Dayton, raises Southdowns, and sells wethers at three years. The Percheron, Coach and Hackney horses are much raised. Dr. E. H. Huson, of Stone Ranch, crosses these with the Hambletonian and Morgan, gaining thereby endurance and speed. The last two breeds are deservedly popular. Berkshire and Red Jersey swine are fed in summer on alfalfa, and in winter on chopped corn. Plymouth Rock and Leghorn fowls, Angora goats and Spanish and California mules are reported successful.

As the shipping facilities of this region have been limited, the crops have been confined to those products demanded for home consumption. With the development of manufactures, and the advent of the railroad, new lines of agriculture will be pursued. The frontier farming already done gives sure promise of great agricultural possibilities for Northern Wyoming.

In this part of the State the soil is of many varieties, and has been proven wonderfully productive in the cereals and root crops. Considerable progress has also been made in fruit-raising. J. A. Becker, superintendent of the Sheridan Experiment Farm, writes: “Most of the small fruits have been successfully grown here. It is probable that only the more hardy varieties of large fruits will stand the climate.” To insure success in this region, the following suggestions are made, in addition to the usual cultivation:

1. Mulch all trees in the fall, taking care not to let the mulch lie directly against the body of the tree.
2. Thoroughly soak the ground occupied by fruits late in the fall, so they will not dry out through the winter.
3. Tender shrubs and vines, as blackberries, raspberries and grapes, should be bent to the ground, and enough earth thrown on to thoroughly cover them, for winter protection. Do not uncover until spring is fairly opened.

From answers to the circular, the following varieties are recommended for planting and further trial:

FRUITS.
Apples—summer and fall, Duchess, Red Astrachan,

**GARDEN VEGETABLES.**

HORTICULTURE IN WYOMING.

The conditions are so varied that it becomes difficult to recommend varieties for the whole State. The amount of land planted in fruits in the northern part of the State is variously estimated at from five to forty acres; eastern part, ten to twenty-five acres, and in the southern and western parts, from five to twenty acres. Taking the largest estimates, there are not more than eighty-five acres planted with fruits of any kind in the State. The orchards are all young, the most of them just beginning to bear. The attempts at fruit-raising, therefore, are as yet in their infancy. While many trees are, to all appearances, hardy and successful, we should guard against reaching conclusions too hastily, as only years of trial will prove or disprove the adaptability of the larger number of varieties. The success already attained is encouraging, and should cause larger and more varied experiments. With the Experiment Stations to lead in the work, the people have every advantage, with but little risk. One caution is necessary: *Buy only western grown trees*.

Planting small fruits is a safe investment in all parts of the State, providing the proper amount of care is given. All varieties of currants, gooseberries and strawberries, and the more hardy varieties of raspberries, blackberries and grapes, will succeed. We are not prepared as yet to say which one of each will do best.

Among garden vegetables, all root crops and early varieties of cabbage are unusually successful. The favorite varieties of early potatoes are: Clark's No. 1, Early Ohio and Early Rose; late—Mammoth Pearl, Blue Victor, Beauty of Hebron and Late Rose. Celery is worthy of more extended trial. White Plume and Crawford's Half Dwarf are the favorite varieties.

39-(175)
Best Farm Crops and Stock for Wyoming.

The Wyoming Agricultural Experiment Station recommends the following farm crops and stock for Wyoming. $N$ means for the North, $S$ for the South:

**Spring Wheat**—Fyfe, Touse, Russian, Oregon, Chili, Club $N$, Amber $N$.

**Spring Rye**—Salter’s, Wild Goose, Giant, Dutch.

**Winter Rye**—Black, German.

**Oats**—Welcome, Russian, Banner, Tartar, Siberian; Side.

**Barley**—Two, Four and Six-Rowed, Manshury, Okshott’s Winter.

**Buckwheat**—Japanese, Silver Hull.

**Flax**—European, Russian, Common.

**Field Peas**—Early Scotchman, Canada Marrowfat, Alaska.

**Field Corn**—Flint $N$, Minnesota King $N$, Pride of North $N$, Mandan $N$, Ninety-Day $N$.

**Fodder Corn**—Yellow Dent, White Dent, Flint, Sweet.

**Fodder Sorghum**—Early Amber, Kaffir, Jerusalem, Dhoura, Millet.

**Tame Hay**—Timothy $S$, Alfalfa, Red-Top, Orchard Grass $N$.

**Tame Pasture**—Alfalfa, Timothy, Red Top, Red Clover $N$.

**Wild Hay**—Blue Stem, Grama Grass, Blue Joint $N$.

**Root Crops for Stock**—Rutabagas, Sugar Beets, Carrots, Artichokes.

**Beets for Sugar**—Klein Wanzleben, Improved Vilmorin, Simon La Grande.

**Range Sheep**—Merinos, Shropshires, Southdowns.

**Pasture Sheep**—Merinos, Southdowns, Oxfords.

**Swine**—Poland China, Berkshire, Red Jersey.

**Poultry**—Leghorn, Plymouth Rock and Game Fowl. Bronze Turkeys.

**Goats**—Angora, Cashmere.

**Mules**—Spanish, California.

**Farm Horses**—Clyde, Norman, Morgan.

**Range Horses**—Morgan, Hambletonian, Coach, Suffolk.

**Range Cattle**—Hereford, Shorthorn, Galloway, West Highland.

**Pasture Cattle**—Shorthorn, Hereford, Devon, Sussex.

**Dairy Cattle**—Shorthorn, Jersey, Holstein, Ayeshire.

Plow ground in fall, to be pulverized by frost, and settled for early planting. Shelter young crops in drill furrows at right angles to prevailing winds. Do not waste irrigation water by wetting the deep sub-soil. Drain off all dissolved alkali. Do not drown plants in mud, but give the roots air in a moist, mellow soil. Cultivation saves irrigation. Kill foul weeds everywhere. Ripen crops before frost by stopping irrigation early. Air-dry all grasses and forage plants for stock food. Breed only from the plant or animal that is most adapted to Wyoming conditions. Well selected and maintained home varieties and home breeds are best.