



ARID farming is the newest of the sciences.

In a quiet way it is accomplishing more than any other single agency in the making of a new Utah. Because its wonders are performed in silent sagebrush valleys, far from the eyes of investigators and writers not especially interested, very little light has been thrown upon its work.

As a science it seeks the development through evolution, of a grain so hard and drouth resisting it will grow as sagebrush grows in any waterless soil. For the soil it seeks a method of treatment that saves to it through the hot summer a maximum percentage of the winter's snow and the spring's rain. As a factor of Utah industrial life, in five seasons it has increased the value of thousands of sagebrush acres from \$1.50 per acre with no takers, to \$20 or more per acre with a lively demand where land can be had in large tracts.

The place it is taking in the new industrial Utah is suggested in the fact that with but a few years of experimenting behind it, it has already redeemed more miles of Utah desert than has irrigation in all the 61 years of its constant use.

"Dry farming," as the art formerly was called, was developed into a science in Utah by Dr. John A. Widtsoe, now president of the Agricultural college. His "Dog Valley" experiment was what sent interest in the science on fleet wings over southern Utah. To all who inquired he told the secrets, fall plowing, soil, culture, and seed selection on which results depend and he exhibited these results in the terms of actual bushels and pecks, to those who came to his desert farm in the Levan hills, innocent of all suggestion of ditch irrigation.

That was five years ago. At the time the only land in the dry section of Juab valley's southern portion that had been located upon was the piece on which stood a switchman's switch house. He had lapsed his rights after making the first payment. This land now could not be bought at \$25 per acre, and produces good interest upon a sum larger than this.

The kind of wheat used for arid farming has changed each year with new developments. The farmer can no longer afford to pass over the work of the experimenters and college investigators, and the farmer who puts in a crop of wheat this fall without first finding out what was the latest result in experimentation, will probably pay a decided penalty next summer in minimum results from his possibilities.

With arid farming in Utah Prof. Lewis A. Merrill has been closely identified from its very beginning. In responding to an invitation from the "News" to discuss the results obtained this year, he has thrown much light on what has been done, and indicates

the lines where the present state of experimentation rests. A similar article written a year from now may tell much that is new, for the science is one that is yet in its infancy.

ONE of the results of the second session of the Trans-Missouri Dry Farming congress, held in Salt Lake City last January, was a renewed interest in the practice of dry farming throughout the state. During the past season there has been much greater activity along these lines than ever before, practically every county in the state participating in this renewed effort. Arid farming is resulting in the reclamation of thousands of acres of our sagebrush lands that could not possibly under any other means be brought under cultivation. At the several experiment stations established by the state, the results of the season's work have been very satisfactory, especially is this true of the farms located at Grantsville, Tooele county, Nephi, Juab county, and Enterprise, Washington county. On each of

these farms, the yields obtained have been above 35 bushels per acre on those plots where the conditions have been made most favorable. The yield has been as low as 8 bushels per acre on those plots where improper cultural methods have been used. This great distinction in the yield emphasizes the importance of proper cultural methods.

ON A FIRM BASIS.

The writer is in receipt of a number of letters from prominent dry farmers throughout the state, from Cache county on the north to Washington county on the south, and these reports all indicate that arid farming is established on a firm basis than ever before. It is true that there have been many discouragements, but in the main these difficulties have been overcome, and the total results of the year's efforts is a distinct encouragement to those who are attempting to subdue the desert.

During the early spring there were two months of extreme drouth, but in every case where the land had been summer fallowed and a mulch kept during the previous season on the fallowed land, the crops had no difficulty whatever in withstanding

the drouth. In a number of instances where an attempt was made to grow two successive crops, the long period of drouth resulted in a dismal failure for these crops, and the lesson taught to the arid farmers of the state was that if success is to be attained, there can be but little deviation from the methods already outlined by those who have made a study of this subject.

THEN AND NOW.

During the summer the writer had the privilege of visiting one field of 300 acres in Juab county. The wheat was of uniform height in full head, and ready for the harvester. The last time he visited this field, some five years ago, it was covered with heavy sagebrush, and gave little promise of what the future had in store. The sight was most beautiful and inspiring and would certainly be an object lesson to those who have been pessimistic regarding the success of this movement. Two hundred acres of this field yielded 35 bushels per acre, the average of the whole field being 31 bushels. Mr. Isaac H. Grace, manager of this farm, has adhered strictly to the proper methods, a brief outline of which is herewith

given: Mr. Grace gives his stubble land a deep plowing in the fall, the land is then left rough (unharrowed) during the winter, and in the spring as soon as the volunteer wheat has started, he goes on the land again, this time using four disc plows with four horses, whereas in the fall he used a two-disc plow with five horses. The spring plowing is done just as shallow as it is possible to do it, thus turning under all of the growth, harrowing immediately after, during the same forenoon or afternoon, as the case might be, and thus preventing the escape of any moisture. The ground is harrowed several times during the summer season in order to keep the mulch that has been established. It is then ready for seeding, and along in September or October, Mr. Grace goes on the land with his press drill and seeds at the rate of 45 pounds of seed to the acre. The wheat grown this year was of the Kofod variety, but Mr. Grace evidently has considerable faith in the Turkey Red variety since he has just seeded some 40 acres of this wheat and proposes to give it a fair trial along side with his Kofod. The method followed by Mr. Grace enables him to keep the land free from weeds and volunteer wheat. He is satisfied that he stores two seasons' precipitation for the use of one crop, which method practically insures a crop. He feels too that where the land is plowed and left loose in the fall, the freezing and thawing during the winter sets free considerable plant food that would otherwise be inert.

The writer has visited other fields in Cache, Boxelder, Davis, Iron, Washington and Tooele counties, where the results have been as satisfactory as those on the farm referred to, all of which indicates that where the farmers have gone at this matter in earnest, that there is every reason for encouragement.

HORSES VERSUS CATTLE.

The year's experience in dry farming has brought the question of machinery into prominence again. There are many who argue that the greatest success is attained where the plowing is done by horses or cattle. Mr. Jesse M. Smith of Davis county advocates the use of cattle for plowing, while Mr. Grace of Nephi, finds that the use of horses is most satisfactory. Others contend that the plowing can be done just as well and more economically by the use of steam engines. It is still an open question, and from all of the experience that the writer has been able to gather, he feels justified in urging extreme caution to those who are about to engage in dry farming. Certainly it would be better to proceed cautiously with as little machinery as is necessary, and as the land is brought under cultivation, the more expensive machinery can be had.

HARVESTING MACHINERY.

In harvesting, there is no question concerning the success of the combined harvester and thrasher. Three of these machines have been added to the resources of this industry during the past season and this in addition to the combined outfit owned by the Utah Arid Farm company at Nephi, makes four of these machines in operation. Two of these machines are drawn by steam engine, the machine being driven by an auxiliary engine attached to the side of the harvester which receives its steam power from the traction engine. Two of these machines are drawn by some 32 horses, and the owners of these machines express entire satisfaction with their use.

The work on the state experimental arid farms is resulting in great benefit to the people of the state in introducing new varieties, in developing new cultural methods, and in demonstrating to the people in the various localities that the industry is a feasible one. The season just closing has brought out again the fact that in the Turkey Red variety, the station officials have found a wheat that will withstand winter-killing, endure drouth, and keep from shelling better than any other variety yet tried. The Tooele county farm has been seeded for the coming season with this variety alone, and it is the hope of the station officials that in a very few years all of the dry farmers of the state will be growing that variety.

At the recent state fair, these farms had a splendid exhibit of wheat, oats, barley, sugar beets, potatoes, hemp, and flax, all grown on the deserts miles away from the irrigation canals. The exhibit was a very instructive one, and from inquiries received it is evident that thousands of farmers expect soon to add some of the sagebrush land to their farming acre, and it is the dream of the converts to this industry that the time is not far distant when Utah's three per cent cultivable area will be increased to at least 50 per cent.

Awakening of Utah's Interest in Wielders of Rod and Gun

(Continued from page twelve.)

In the hand or hands, the rod or pole to have only one line attached thereto, and the line to have attached thereto artificial fly hooks not exceeding two in number; or one baited fish hook with no more than one gang of no more than three hooks, between the 14th day of June of each year and the first day of April following."

STATE GAME PRESERVES.

According to reports coming from different parts of the state, the game supply is in better condition than it has been for years. Deer are increasing in numbers, thanks to the protective laws which have been in effect for a number of years. Deer is found in all the mountainous sections of the state. The present game law permits any person to kill two male deer with horns during the month of October of each year. Game Commissioner Cromar is of the opinion that the law should restrict the killing to one deer per year, and that may be of either sex. This would do away with any smuggling of female animals killed unintentionally or otherwise, and would serve to further protect the deer until such time as it shall be deemed wise to permit the taking of more.

Bear is also on the increase in the state. There is no law against the killing of this brute, and many specimens have been brought to bay in the northern portion of the state during the past season, notably in Ogden canyon and in the mountains above Bountiful. South as far as Sevier county reports of killing of bear are brought, and lovers of this sort of game are assured of reward for their search in the localities mentioned.

Prairie chickens, sage hens and pine hens are rapidly diminishing in supply all over the state. The game commissioner thinks the present law should be amended so as to protect these birds from the ravages of the hunters until their numbers are greatly increased.

Wild ducks are well protected under the present law, and its beneficial effects may be noted any bright morning along the streams and sloughs west of town. The matter of the right, however, for one man or set of men to purchase all the available duck or swamp land in which these birds are wont to congregate, and under the protection of law prevent others from taking any ducks whatever frequenting the waters on such lands, is one on which many people, and especially those who are not financially able to pay \$1,000 or more for a membership in a gun club, remains skeptical. It is a fact that almost all the available duck grounds surrounding Salt Lake City are covered with membership clubs, which with the authority of law proclaim to the ordinary hunter that he may not enter there for the purpose of hunting ducks unless he is armed with a membership certificate indicating possession of a certain number of shares in some gun club.

Following this principle to its logical conclusion, it will not be many years before every stream in the state will be covered with private ownership signs, forbidding any person to fish or hunt along the streams so fenced in, or upon ponds and public waters hedged in by gun and duck clubs.

What the private citizen will do then for a day's fishing or hunting sport is a question for wise statesmen of the future, for those of the present are unable to give the answer. Under the present condition of things, a duck flying along through the air, prior to crossing a certain line indicated in any private preserve, is a public duck, but after passing that line becomes at once a private bird, and may not be had by any person except said person holds ownership in that particular preserve, or be permitted by some one who does. The purpose of the fish and game department of the state is to preserve and protect and supply fish and game for the citizens of the state, and not for the cliques, the clubs or the private flocks, by reason of their wealth are able to buy the privilege in respect to public property which the poor man is unable to reach. It has been declared by some that a public stream remains a public stream though passing at times through privately owned ground; and that it is not within the province of the owner of the ground through which the public stream passes, to prohibit individuals from fishing or hunting in the stream passing through his property, provided he does not trespass in other ways. The right of the stream, and the fish therein, is declared to be equal in all citizens of the commonwealth, and does not become private by the fencing in of the ground surrounding the stream or pond.

The same question has been "threshed out" in the courts of New York state within the past few years and resulted in a decision upheld by three of the courts of the state against the right of the individual to fence off as private preserves streams stocked with public fish.

CHANGES PROPOSED.

A number of changes are proposed to the present fish and game law of the state. Utah is one of the largest states, from a fish and game standpoint, in the Union. Her area is 84,928 square miles of which 84,096 square miles is land; and the greater part, if not the whole surface of the land is bounded under the license law. It is possible in the state are fishing grounds, so to speak, and require constant watch care to prevent the unlawful killing and catching of trout and other valuable fish.

The salary of the state fish and game commissioner under the present law, is \$100 per month. In some eastern states, with not more than half the area of this state, the salary of the state warden is from three to five times higher than that of the Utah official. In New York, with an area of 47,687 square miles, the salary of the state warden is \$5,000 per year; in Illinois, with an area of 56,004 square miles, the warden's salary is \$2,500 per year. In Montana the deputies receive \$100 per month each, and in California the deputies receive from \$50 to \$125 per year, depending upon the localities in which they are placed. The salary of the Utah state warden is woefully insufficient, as the position requires expert knowledge and experience not easily obtained in the lines required. It is proposed to increase the efficiency of the department in proportion to its importance in the state, and with the added funds obtained under the license law it is possible to be done, by increasing the salary of the state warden to \$2,500 per year; and to give him power to employ six chief deputy wardens at a salary of \$100 per month each; also to empower him to appoint special wardens, when necessary, at a stipend of \$3 per day for the time actually spent in the service, and in this way sufficient help could be had for protecting the fish and

game in the season where only a small proportion of the area is under protection. Under the present system, a contingent fund of at least \$1,500 per annum is proposed for the department, and that it is necessary is evident from the numerous trips to different parts of the state in the delivery of fish fry shipments. Many localities have been held out of supplies of fish fry on account of the depleted condition of the contingent fund, which by the act of the legislature was limited to \$600 for the last two years, and which has been exhausted long since in the distribution of the fry from the hatchery. A deficit of \$500 was authorized for the department, and of this amount there remains only about \$50 for the remaining two months of the year, and this with the most rigid economy possible to be exercised on the part of the game officials of the state.

The present law authorizes the appointment in each of the counties of the state, by the county commissioners of such county, of a deputy warden whose salary shall not exceed \$50 per month. It is proposed to place the appointment of all deputies in the hands of the state fish and game commissioner, as being best calculated to secure harmonious action among the deputies, and at a salary, which will insure the securing of competent men in these positions.

SELF SUPPORTING.

It is proposed to increase the bond of \$1,000 for the state commissioner to \$5,000, and to provide him with an office assistant at a salary of \$15 per month. This and the sale of the licenses will take care of all this and the department will be entirely self supporting. All improvements contemplated, which will place the status of fish and game of the state on a par with any in the Union, is amply provided for in the income received by the department through the enforcement of the license law, which rests largely in the hands of the warden and his assistants.

Another change proposed is to the effect that owners of mills and irrigation companies must at their own expense erect fishways and screens for the exclusion of trout from their canals. Violation of this requirement is punishable by a \$100 fine.

It is also proposed to limit the open season for trout to the period between the 14th of April of each year and the 1st of January following. It is also provided that no trout shall be sold from any private hatchery or plant unless each fish is plainly marked with a private mark to be registered with the state register of marks and brands. Violation of this proposed amendment is punishable by a fine of \$100 or by not more than 120 days' imprisonment, or both.

The confiscation of guns or tackle found in the possession of persons detected in the unlawful taking of fish or game in the state is authorized in another change proposed. The guns or tackle so confiscated to be sold at auction to the highest bidder and the funds so derived to be turned into the fish and game fund, which latter fund is created by a section added to the proposed law.

It is claimed that more than half of the trout fry planted in the state is lost through the absence of proper screens from the head of irrigation canals, permitting the fish to escape into the canal waters and become scattered out over the lands irrigated by the waters of the streams. The new law proposes to make the erection of screens obligatory upon the owners of such irrigation streams, with suitable penalties for failure so to do.

(The growth of the fish culture industry for the market, especially in the vicinity of Murray, is treated upon another page of this edition.)