

ANNUAL REPORT
1924
AGRICULTURAL AGENT
IMPERIAL COUNTY
ARIZONA.

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ANNUAL REPORT
OF
MARICOPA COUNTY, ARIZONA
AGRICULTURAL AGENT
FOR YEAR ENDING
DECEMBER 1, 1924.

RELATIONSHIP.

The extension organization in Maricopa county, Arizona, is unchanged from that of the past few years. A resident agent is in charge of Home Demonstration work, another worker is in charge of office matters, and the third member of the group is the county agricultural agent. This force is much too small to handle the work in the most desirable manner, since the county has about 325,000 acres of irrigated land under cultivation, cropped the year through, while similar developments likely to be put through in the next few years promise to just about double the acreage of the county. The population is probably near 100,000. Soil and climatic conditions are such that there are few crops grown in the United States which cannot be grown locally, while the range of crops already commercialized is extremely large. The mild temperatures of winter permit the growth of hardier forms of vegetation even during the coldest months. Hence extension offices are busy at all times of the year.

In addition to the resident workers, the service available from specialists from the state extension office is very considerable. In agriculture there has been no change in the personnel of these specialists since very early in the present fiscal year. nor has the personnel of the Maricopa county office changed.

Extension work in Arizona is done cooperatively through the usual channels. In addition to state and federal cooperation provided for under the Smith-Lever act, Maricopa county provides a substantial sum each year to cover office and traveling expenses of the home demonstration and agricultural agents. This fund is, in amount, determined by the county farm bureau, which, under an Arizona act has certain supervisory powers over cooperative extension work.

The county farm Bureau is composed of a board of Directors and suitable officers designated by each of about twenty locals or community farm bureaus. It is, therefore, the most convenient and the most logical organization through which county extension employees might work in furtherance of extension. In the present case the county agricultural agent deals with the county farm bureau on matters of budget and extension policy in addition to the state headquarters at Tucson. The program of work is practically fixed by the agent and county farm bureau. Cooperators throughout the county are usually chosen through the recommendation of the president of the appropriate community farm bureau.

While official relationships ends with the farm bureau, an attitude of sympathy and cooperation, wherever desirable or possible, exists between the county agent and the several cooperative marketing organizations, chamber of commerce, poultry associations and similar public agencies whose aims often coincide with those of the agricultural

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agent. These relationships have been cordial and mutually agreeable in the past years.

PROGRAM OF WORK.

The program of the present agent has been shaped gradually during his seven years tenure of office with many agencies taking a part in its determination. The limitations of personnel make it impossible to care for a separate program for each community, nor has the program shaped between the agent and county farm bureau some years ago been materially altered.

For practical consideration there is one big object in view; the intensification of local agriculture. This means development of many resources now imperfectly developed, such as expansion along safe lines of the grape, date and citrus industry; investigation and development of many lines as yet more or less imperfectly demonstrated, such as the asparagus industry; and intensification of the general farming schemes as applied to crops requiring units of considerable acreage. Of the less intensive crops, grain growing is usually discouraged; alfalfa growing is adapted to large properties, and is encouraged as a money crop on such places, and as a soil renovator; and cotton growing which fills a large place in local agriculture, is the field of effort toward more careful and exact methods.

Dairying has never had any too sound an economic background, locally. This has not been improved in the last year. There is a substantial place for pasturage of range cattle and sheep in local agriculture, but the livestock field of greatest activity is poultry farming, an enterprise and great use to local agriculture.

The demand for extension assistance locally is greater than the supply. While this condition exists it is not deemed wise to attempt too much follow up work. Assurances of the utilization of extension information are sufficient to be convincing as to its value. Therefore no definite plan of follow up work to determine accurately just how far the spread of influence of extension work goes is deemed practical locally. Hence, the statistical report accompanying is very incompletely answered where questions refer to the number of farms adopting improved practices.

In order to cover as much ground as possible certain specialists are taking almost entire care of certain projects without the agent being familiar as to the progress of all details. In such cases the statistical report is incomplete also. For example, practically all the work done in connection with the county cow testing association is directly in the hands of the dairy specialist who has spent some time in the county on such work without a record being kept to be included in this statistical report. The same thing is true of other specialists. That part of specialist work included in the report includes only those instances where the agent was directly active with details in cooperation with the specialist. The major examples of specialists working out all the details of parts of the project are the example above referred to (cow testing association), a bud selection and tree record project on the part of the horticulture specialist, and miscellaneous forms of cotton activity on the part of the crop specialist.

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In addition to cooperation with the specialists a great deal of work was put on jointly with H.W. Miller, Field Assistant in Vocational Agriculture, whose appointment was made early in the present fiscal year. This work was done not only through Smith-Hughes agricultural teachers but directly in many cases where such teachers were not available.

SOIL WORK.

There are three big divisions of the local soil problem; the eradication of alkali, the maintenance of soil fertility and proper selection of soil for specific cropping schemes.

The alkali problem is rapidly being solved. Alkali means something different from its accepted chemical designation when used in connection with irrigated agriculture. Generally it is a concentration of soluble matter near the surface of the soil, which increases the density of soil moisture in that region to a point where osmosis is either negative or the pressure is too slight to enable the root system to take in sufficient moisture. Alkali generally means a concentration of mixed salts, usually the chlorides, sulphates, nitrates and carbonates of sodium, potassium, calcium and magnesium. The chemical nature of alkali is rarely detrimental to plant growth except in so called black alkali or sodium carbonate spots. In local agriculture alkali reclamation is almost entirely a physical matter.

In an arid region when the ground water table gets high enough that there is constant evaporation at the surface due to capillarity, in time the residue from this evaporation makes the surface concentration of soil moisture too great for proper plant growth. This takes place on what formerly might have been the best land as well as the poorest. The rise of ground water table may be looked for in certain places in any western irrigation project of appreciable size, due to disturbance of the drainage equilibrium formed under natural conditions by the application of large quantities of water for irrigation. Therefore, the first problem is to remove the cause of alkali accumulation by draining the land affected. This has generally been done under the Salt River Valley Water Users' project by means of a series of large electrically driven pumps, operated by power manufactured on the project. This pumped water is in many cases used over for irrigation.

The next step in alkali reclamation is redistribution of the surface concentration of salts through leaching. The only practical method of removing alkali is by the same means through which it was concentrated; redissolving in water and carrying it downward through the soil to a depth that will render it innocuous, and diluting that part remaining in the root zone to a point where it is no longer harmful. In this leaching process extremes of conditions are met. The speed with which alkali can be dissolved out depends on the nature of the soil, the nature of the salt mixture and the nature of the water used for leaching. Calcium and magnesium salts tend to flocculate the soil while sodium and potassium salts tends to deflocculate it. Therefore, a coarse permeable soil, high in calcium salts may sometimes be reclaimed from barrenness at a cost of three or four dollars per acre while on the other extreme, reclamation might cost even hundreds of dollars an acre. Furthermore, the salt content of the water makes a great difference in the speed with which it penetrates the soil. As an example, water from one well, containing about 225 parts soluble matter per 100,000 percolated about $4\frac{1}{2}$ times as fast as water from the Roosevelt reservoir containing about 80

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parts per 100,000.

The alkali work of the county agent, therefore, consists in finding out the physical nature of the soils affected, the nature of the salts affecting the soils and the efficacy of water from drainage pumps referred to above, compared with the stored water of the Roosevelt reservoir. Two years ago a scheme was started to gather the necessary data for this work. Prof. C. N. Catlin cooperated with the county agent to make an alkali survey of the valley to determine the belts of alkali that showed similar characteristics of salt mixture, soil, etc. At the same time data was to be gathered as to the rates of percolation of different waters obtainable for leaching purposes. Because of shortage of help both in Prof. Catlin's department and in the county agent's office, this work has progressed slowly and is still incomplete, but a good deal of very valuable data has been worked out. On the basis of this the agent is reporting a reclamation demonstration on one 80 acre farm. As a result of a similar demonstration a couple of years ago, many farmers owning land in another alkali belt, which is easily reclaimable, have been advised as to proper methods, until there is now very little trouble manifest in the region. A proper goal for alkali reclamation is difficult to set until further information is obtained. It is believed, however, on present indications that it is economically practical to reclaim 75% of the alkali land in the Salt River Valley project. Conditions now point to the ability of the State Experiment Station and Extension Service to progress quite rapidly in the solution of the alkali problem.

Maintenance of soil fertility has become a big problem, not difficult of solution, theoretically, but different economically. High prices for cotton compared with other crops, constitute a temptation to plant cotton for several years after the best interests of the soil demand a change. This problem is worked on with some little success, but no very great accomplishments are likely to be reported until more land gets in worse shape than the bulk now is. The main accomplishment is maintenance of soil fertility, therefore, have been made on soils devoted to more intensive crops, particularly tree fruits. A pet project of the present agent has been the improvement of citrus groves. Many of these are poorly cared for when this work was started. A combination of circumstances has brought about a decided change for the better in this regard. The extension service has played quite a part in bringing about this improvement of conditions and many growers are now following out the suggested schemes for maintenance of soil fertility. The goal calls for 100% of citrus groves to be well handled from the soil standpoint. This goal is about 75% reached. Similar results are being met with new developments of deciduous trees.

The general plan outlined is a cover cropping scheme, which varies in detail greatly according to conditions, with the liberal use of coarse manures. The beneficial use of concentrated fertilizers is extremely limited in arid formed soils, and is generally being discouraged.

Local soils, ranging from extremely coarse to very fine, each have their special adaptations. The response of different crops to different soils is so variable that proper soil selection constitutes a major problem locally. Too, soils formed under arid conditions are basically different from humid formed soils; the former being very well supplied with a surplus of soluble and readily available mineral matter, and deficient in organic matter, and the latter well supplied with organic matter and not so amply supplied with soluble minerals. Many new comers planning to locate in

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the country are unfamiliar with arid soils in general and local soils in particular. That there should be a proper choice of soils for a given farming scheme is so important locally that the agent makes a special attempt to inspect all soils for intending purchasers when asked. Twenty-two such inspections, covering over 3300 acres were made during the year.

CROPS.

As stated before, grain growing is not encouraged by the county agent. In season, however, articles are prepared dealing with seed treatment for smut and other cultural conditions. The rest of the grain work done by the agent is generally advice as to planting, irrigation, etc.

While alfalfa growing is encouraged, local experience with it makes a large amount of alfalfa work unnecessary. Therefore alfalfa work is generally confined to advice as to seeding, or growing seed. Work with most other legumes generally has to do with their utilization as a cover crop. Some work has been done relative to control of cutworms, grasshoppers and diseases in alfalfa.

The chief crops work has to do with cotton. In furtherance of this a number of demonstration meetings were called to discuss and demonstrate growing methods, irrigation, the effect of different planting methods and varietal differences.

Four variety comparison plantings were made by cooperators throughout the county.

Organization of a pureseed district was effected in one community where conditions of isolation were satisfactory. This organization at present only handles cotton seed but may eventually handle several kinds of farm seed. The plan of organization is roughly as follows: In the district only one variety of a given crop may be grown, where such crop is subject to cross pollination. Any harvesting or processing operations prior to the use of the resulting seed must be done with the utmost care to prevent mixing. Hence, only one kind of cotton is to be ginned in the gin handling the seed cotton from the district. The extension service, in furtherance of the project, plans to annually rogue the increase fields, so that the planting seed source may be kept as pure as possible from any admixture of other varieties. The association, in consideration of the extension activities, plans and agrees to sell resulting seed to other farmers at a reasonable price. The seed district organization has been primarily arranged for by the crops specialists, B.J. Showers, who in addition has made numerous calls, held conferences and meetings, and prepared publicity not reported on in the statistical summary.

HORTICULTURE.

Horticultural work is considered of prime importance in Maricopa county, both because the money value of the local horticultural development is considerable and because prospective development is very great. Many signs point to certain development which will almost surely take place in the next few years. In order to favorably influence developments when they have attained considerable size, an effort is being made to assist the pioneer in such developments to handle their projects in a desirable manner

so that when the larger developments are an accomplished fact, standard local practice will be sound. An example is in grapes, which have been receiving considerable notice in the past few years. By virtue of a good deal of work during the beginning of the commercial plantings, almost everybody now growing grapes in the county on a commercial scale is following a reasonable desirable system of training. While methods of individual growers are subject to great improvements as to detail, the general practices are desirable and new developers will likely follow methods advocated by the extension service whether they make direct contact with the service or not. A similar example is in developments of deciduous fruits. While many factors have contributed to this desirable condition, the extension service has played an important part.

Work with grapes and truck crops has been mostly to encourage the use of sound basis methods. Some grape pruning demonstrations have been conducted and considerable work has been done relative to the control of insect and disease damage. Part of this was due to a quite severe infestation of the steel blue grape vine flea beetle early in the season, while other major grape insect pests combated have been the leaf hopper and thrips. In addition a very thorough fertilizer demonstration has been planned on a large grape planting for the following year.

Work with treefruits has been largely along four lines; pruning, tree record work, soil maintenance and top working. Pruning work has been with the intent to cause general understanding of the best principles of pruning for local conditions, and to demonstrate best methods for properly forming a head on a tree. Almost one years time can be gained in proper heading of stone fruits, hence its importance.

Tree record work is at present confined to citrus. Two objects are in view; to locate desirable bud-wood, which will propagate a fruitful tendency, and to determine which trees in a grove are inherently or otherwise unprofitable. Several cooperators are furnished record tags, one of which is attached to each tree. The trees are numbered with a double numbering system. The row number is painted on the trunk in a conspicuous place, and immediately underneath is painted the number of the tree in the row. The tags attached to the trees are appropriately numbered, and as the fruit is picked the proper amount of fruit is recorded on each tag. At the end of the season these tags are collected and the information they contain is recorded on a permanent record sheet, on which the yield of each tree for a series of years is recorded in such a way as to be readily comparable. This work has been ably handled by A.F. Kinnison, the horticultural specialist, without an appreciable amount of effort being spent on it by the county agent during the present year. It will be continued for a period of from three to five years before it will be considered as a completed demonstration.

Soil maintenance work has been hinted at in the report on soils activities. It consists largely in advocacy of suitable cover crops and coarse manures. Most citrus groves are suitably handled at present on this basis and while many factors contributed to this improvement, the extension service activities had much to do with it. New groves being developed are very generally well treated.

A satisfactory system for top working citrus locally has not yet been devised. A good deal of effort has been spent by the specialist and county agent in demonstrating the most satisfactory methods for working citrus. This has necessitated pointing out what cannot be depended on as much as advocating practices that are fairly dependable. The pecan industry, having been quite stimulated during the past few years, has offered the occasion for further top working demonstrations. Hence, eleven pecan top working demonstrations were staged during early spring. Two objects are in view; to bring a few promising varieties into bearing quickly, replacing undesirable seedlings, and to distribute a good supply of bud-wood of desirable varieties as rapidly as possible. The chief graft used in these demonstrations was a modified bark graft of local origin called the Biederman graft. This may be used either as a stub or side graft, usually the former. It is characterized by a fairly long scarf, the wood of which is slightly hollowed out, so that the scion will fit snugly against the stock. The sides of the bark back of the scarf is inserted into a single incision, much like a shield bud, and the bark of the stock tacked snugly against the scion, after which the scion is waxed over thoroughly, and tied snugly against the stock. The Biederman graft is being introduced to Arizona horticulturists by A.F. Kimmiscn.

ANIMAL HUSBANDRY:

Largely because of pressure of time, little animal husbandry work was done. The livestock specialist, however, has been able to carry out a great deal of distinct benefit to the range industry in Maricopa as well as other counties. Livestock work in which the agent and specialist cooperated consisted in two swine judging demonstrations for club boys, one sheep judging demonstration for club boys, a beef cattle grading demonstration which was well attended by feeder and stockmen. Assistance was rendered at the feeder's day at the state experiment farm near Mesa, where the past season's beef feeding experiment was reviewed. The economic situation makes it appear infeasible to attempt to develop a swine industry locally. Much desirable work could be done with sheep and beef feeding, but the time of the agent is already scattered too much, hence little has been attempted in these lines.

DAIRYING:

The dairy situation is more or less chaotic since certain factors tending to improve the economic basis have failed to continue functioning. Therefore there is not a demand for a large amount of work. A cow testing association formed on a county basis, and employing two testers was kept in good condition by R. H. Davis, extension dairy specialist. This organization has a membership of about 35, and from 900 to 1000 cows are on test during the year. The annual cow testing association picnic was staged during the summer with a very satisfactory attendance. The program was primarily educational with one or two entertainment features. Several meetings were held during the winter months at which time different phases of the dairy industry were discussed.

POULTRY:

The intensive nature of poultry farming, with its possible profits makes it a very desirable industry for the county. Accordingly as much work as possible

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was done for the benefit of the poultry industry. This included 10 culling demonstrations, in which nearly 1800 birds were handled, and five caponizing demonstrations. Several meetings at which topics of general interest to poultrymen were discussed, were held during the year. Very numerous farm calls were made to poultry farms, largely to identify and prescribe treatment for diseases or pests, and to discuss arrangements of the plant, housing, feeding, etc. Practically all of the demonstrations were conducted by L. C. Doggs, extension poultryman.

OUTLOOK AND RECOMMENDATIONS:

The outlook and recommendations have been hinted at in the preceding pages of this narrative report. As has been pointed out previously, the most serious handicap is lack of sufficient help to properly cover the work of the county. This deficiency works against the popularity of extension work to a certain degree and the cure is merely to supply the help needed. There are two ways in which this can be accomplished; by adding to the personnel in the county agents office, and by adding to the specialist force, allowing specialist to do a lot of detailed work with the sanction of the county agent, but without his directly supervising the details of such work. While this is not the usual practise, as far as is known to the present agent, the fact that most of the agriculture of Arizona lies in Maricopa county seems to be sufficient reason to make this practise proper locally.

Agricultural extension work in Maricopa county has gone on with reasonable smoothness during the seven years incumbency of the present agent, and was in good condition upon his arrival. There seems no reason, therefore, for anything but optimism over its future.

Respectfully Submitted
H. C. Doggs