No one can with assurance know precisely what is ahead for agriculture, desirable as that would be. It is possible, however, by a study of the past and the economic principles it reveals, and an appraisal of the present situation, to forecast the immediate future with a fair degree of accuracy under most conditions. Situations that cannot be foreordained, such as extreme drought and shooting wars, may, of course, upset the best of studies.

The Present Agricultural Situation

The economic position of agriculture at the present time is not so favorable as it has been for the past ten years. Average prices received by farmers for all produce sold have been steadily declining since the beginning of 1951 (fig. 1). The index reached 313 (1910-14 = 100), an all-time high, in February 1951. By September 1951, it had declined to 291, a drop of 21 points or 7 percent. During the last three months of the year, however, prices strengthened so the December price index was 305, making a net decline during 1951 of only 2 points or 2.5 percent. At that point, prices turned down again and during 1952 dropped 31 points or 10 percent. This trend has continued so far during 1953. The September 1953 index was 256, 11 points below January 1953. Thus, from February 1951, to September 1953, a period of 31 months, the index of farm prices dropped from 313 to 256, or 18.2 percent. Assuming the same volume of sales, this means that gross income was reduced by the same amount.

A major segment of the farm problem stems from the fact that farm costs do not move up and down simultaneously with farm prices. In February 1951, when farm prices reached a peak, the index of farm costs was 277. Costs, however, continued to rise until May 1952, when they reached a peak of 290. This was a rise of nearly 5 percent. During the same time prices received by farmers declined about 6.5 percent. Since May 1952, farmers' costs have tended downward, and in September this year the index was 277, a decline of 13 points or slightly less than 4.5 percent. This decline has been almost entirely in items such as feeds, seed, and livestock which, while a cost to some farmers, originate on other farms. Costs of most manufactured items, taxes, and wages of hired laborers are at record high levels and some are still rising.

As a result of the drop in prices farmers receive and the persistent increase in costs the parity ratio is now unfavorable to farmers. The parity ratio is the ratio of prices received by farmers to the prices they pay for the goods used in farm production and living, with 1910-14 considered as 100 or normal. This ratio was below 100 continuously from 1920 through 1941. The low was 58 in 1932. Beginning with 1942, it was above 100 until 1949, when it slipped to 99. In February 1951, it rose to 113; since then it has gradually declined to 92 for September this year. Much of the current discussion is probably actuated by fear that this ratio might drop to the levels of the 1930's.

Prices are only one of the factors that determine the economic welfare of any group. Net income, which for farmers is a result of prices received, volume of sales, and prices paid and volume of purchases for production purposes, is more significant. The average net income to agriculture from 1935-1939 was about 4,300 million dollars. In 1947, it was 16,774.
OUR NEW PRESIDENT

Henry Aldous Dixon

Dr. Henry Aldous Dixon became ninth president of Utah State Agricultural College, August 8, 1953. Dr. Dixon, who has spent most of his life as an educational administrator, comes to USAC from Weber Junior College at Ogden where he was president in 1919 and again from 1937 to the present. He also served as superintendent of the Provo City Schools at two different periods—1920 to 1923 and 1932 to 1937. During the interim of years, he took time out to be managing director of the Farmers and Merchants Bank at Provo where he was not only a successful business man but also a community leader as evidenced by the fact that he served two terms as president of the Provo City Chamber of Commerce and member of the board of directors of the Salt Lake City Branch of the Federal Reserve Bank. He has also served as president of the Ogden Chamber of Commerce.

Dr. Dixon is an able administrator. One of his outstanding characteristics is his friendliness, his ability to understand and get along with people. He is interested in farm people and their problems and he is fast becoming acquainted with farm leaders.

In accepting the position as president he expressed the hope that all major problems of the institution in the future could be thought through together with the faculty and the students. He went on to amplify his philosophy of education in the following statements: "I believe that education is to make a life as well as a living; and I believe that many a living has been ruined through not being able to make a life, and many a life has been ruined through not being able to make a living. Liberal arts and the vocational and industrial arts should go hand in hand. I can see in the great concept of the land grant colleges the greatest opportunity for this balanced philosophy that there is anywhere."

Dr. Dixon believes that all those who work under a policy should have a voice in its development. One of his first suggestions was the cooperative development of a code which would clearly define functions and establish policy. Committees of the students, faculty, administration, board, alumni, and townspeople are now working on such a code.

Dr. Dixon is a native of Provo, Utah. He received his bachelor of arts degree from Brigham Young University in 1915, his master's degree from the University of Chicago in 1917, and his doctor of education degree from the University of Southern California in 1937. As president of Weber College, Dr. Dixon gained national recognition for his promotion of terminal education in the junior colleges and wrote a widely accepted book on the subject. He was the only junior college president named to President Truman's Commission on Higher Education. He has been president of the Northwest Association of Junior Colleges, and has been a member of the advisory board of the U. S. Office of Education.

Dr. and Mrs. Dixon have six children, four girls and two boys, all of whom are college graduates.
DIETS OF UTAH SCHOOL CHILDREN DEFICIENT IN

Vitamin C, Calcium, and Iron

By ETHELWYN B. WILCOX

Vitamin C or ascorbic acid, calcium, and iron were the three nutrients found in studies made by the Utah Station to be most often deficient in the diets of many school children from the Ogden area. Seven-day diet records of the children were a part of a nutritional status study conducted in 1950 to determine the relation between diet and physical well-being of children with and without a history of rheumatic fever.

The 132 children, ranging in age from 5 to 19 years, who comprised the group who had had rheumatic fever were from the Ogden rheumatic fever clinic and were paired as to age, sex, and economic status with children from the same area who did not have a history of rheumatic fever. Seven-day diet records were kept during the time between July and November 1950. A nutritionist visited the home of each child and gave the mother instructions for keeping the records. A comparison was made of the average daily intakes of 10 nutrients. Girls in the non-rheumatic group were consuming significantly more calories, protein, fat, iron, thiamine, and niacin than girls in the rheumatic-fever group. Differences in (Continued on page 82)

DR. ETHELWYN B. WILCOX is professor of foods and nutrition. More detailed reports on this research have appeared in technical journals. The study is part of a Western Regional Research Project and was supported in part by regional funds (W-4) from the Research and Marketing Act of 1946 and in part by other federal and state funds. The U. S. Bureau of Human Nutrition and Home Economics and the Utah State Department of Health also cooperated in these studies.

% Boys in rheumatic fever group % Girls in rheumatic fever group % Boys in non-rheumatic group % Girls in non-rheumatic group

Fig. 1. Percentage of children with diets that did not meet two thirds of the National Research Council recommended allowances

Fig. 2. Percentage of children with diets meeting the National Research Council recommended allowances

Fig. 3. Percentage weight deviation from normal when compared to Baldwin-Wood weight-height-age tables

for December 1953
TWO NEW ASSISTANT DIRECTORS APPOINTED

Other Staff and Departmental Changes

DAVID A. BURGOYNE and Bliss H. Crandall, both former staff members, have been appointed as assistant directors of the Station to replace Dee A. Broadbent who became business manager of the College.

David A. Burgoyne has been secretary and assistant to the director since 1921. During this time he has worked with four directors, William Peterson, P. V. Cardon, Lowry Nelson, and R. H. Walker. During times between the resignation and appointment of new directors and when the director has been out of the state on special assignments, he has been acting director of the Station. In his new position he will assist Director Walker with the business management and financial affairs of the Station. He will also have responsibility for the foreign visitor program.

Mr. Burgoyne is a graduate of USAC in business administration. He received his M.S. degree in agricultural economics from the University of Illinois in 1937.

Bliss H. Crandall has been Experiment Station statistician and professor of applied statistics. He will still keep these positions but will be aided in this phase of the work by Dr. Rex Hurst who was appointed supervisor of the Statistical Laboratory. Professor Crandall will assist with the technical phases of the research work of the Station including the setting up of research projects and analyzing and reporting the results. As professor of statistics, Professor Crandall has assisted the statisticians of the Experiment Station in the design of their projects to assure the reliability of the results. In recent years a statistical laboratory has been established under his direction to aid in the computation and analysis of research data. Consequently his previous experience has made him well qualified for his new position.

After taking his bachelor of science degree in agronomy in 1937 at USAC, Professor Crandall remained at the institution as research assistant in agronomy from 1937 to 1939. He then went to Iowa State College for graduate study. He received his master of science degree from that institution in 1942 and returned to USAC as assistant professor of agronomy for one year. He was then employed by the U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering to work in alfalfa breeding research with headquarters at the University of Nebraska at Lincoln. He returned to USAC in 1947 as Experiment Station statistician. In 1948 he spent six months at North Carolina State College as a member of the staff in experimental statistics.

(Continued on page 84)
Wide Variation Between Counties in Production Of Grade A Milk

By WELLS M. ALLRED and THOMAS I. GUNN

There has been a trend toward increased production of grade A milk in Utah and in the United States as a whole. This trend will likely continue. As population grows, demand for market milk should continue to increase. Dairymen, when confronted with relatively low prices for milk used in manufactured products, will probably continue to find it profitable to shift from production of manufacturing milk to production of grade A milk.

In Utah, for example, the federated price to the dairyman for grade A milk delivered to the plant was $1.44 per pound butterfat in August 1953, if the milk was used in market milk products. The price was only $.80 per pound for the same grade milk if it was used in manufactured milk products such as butter, powdered milk, and cheese. This means that dairymen are getting $1.80 for their milk used in market milk products for every $1.00 they obtain when used in manufactured milk products. (The Federated Milk Producers is an association of dairymen organized to negotiate terms of sale and delivery of all market milk produced by the members and sold in the greater Salt Lake metropolitan area.)

While increased production of grade A milk will not assure consumption of milk in fluid form and in other market milk products and its cost of production is higher, it can benefit producers in the following ways: (1) A more adequate supply of grade A milk will be available to meet any increase in demand for fluid milk or market milk products; (2) A larger surplus of grade A milk will be available to offset cuts in milk production caused by droughts, high feed costs, and similar factors, thereby making it easier for dairymen always to have an adequate supply of milk for the market; (3) To the extent that increased production is obtained by new producers entering the grade A market, more dairymen will share in the higher prices obtained from sale of fluid milk and fluid milk products.

That dairy farmers have been shifting from production of manufacturing milk to grade A is indicated by the increases occurring in the production of grade A milk in 17 federal milk marketing order areas of the Midwest. Between 1941 and 1950 grade A milk deliveries to plants in these 17 areas increased 52 percent and each of the ten years showed an increase over the preceding year.

Another indication of shift in production is the change in utilization of the milk supply. The percent of milk used on farms and for manufacturing milk products, as reported by the U. S. Bureau of Agricultural Economics, has sharply decreased in the last ten years, while the portion used as fluid milk has increased steadily. Fluid milk consumption increased 1 billion pounds per year or 10 billion pounds from 1942 to 1952 while milk used for manufacturing purposes declined 9 billion pounds or 15 percent during the same period. Milk used for
Drainage

Can Reclaim Much Potentially Valuable Land in Utah

By O. W. ISRAELSEN and A. A. BISHOP

The productive capacity of millions of acres of land in the humid regions of the United States has been greatly increased as a result of public interest in drainage during the past century and a half. The first significant progress in drainage was made by John Johnson, frequently designated "the father of tile drainage," when he installed the first tile drain in the United States in 1835. Since that time progress in drainage in the humid regions has been especially noteworthy. More than 100 million acres in the United States are made productive by drainage.

Public interest in solving drainage problems is even more essential in the arid regions than in the humid regions. More than 40% of the productive lands in Utah are damaged by seepage losses from irrigation canals, surface runoff from irrigated lands, and deep percolation losses from the higher elevation irrigated lands. The Experiment Station has, for a decade, conducted research concerning methods and materials for lining of canals to reduce water conveyance losses and to assure efficient conveyance of water. This is a fundamental factor in the solution of drainage problems. Also, land leveling, modern irrigation facilities, and resulting efficient water application are essential. So far, they have only been adopted to a limited extent in Utah.

Recently the Station made a study of Logan River water diversions for 32 years. An average of 54,000 acre-feet of water is diverted from the Logan River each year from May 1 to September 30 to irrigate 10,000 acres of the higher lands. Not more than a third, 18,000 acre-feet, is consumed on the 10,000 acres; hence, 36,000 acre-feet flow to the lower valley lands, on the surface and underground, and cause waterlogging, salinity, and alkali, which are serious losses to the landowners of these low lying lands.

During 1953, on one 250-acre farm in Utah, the water pumped from the river for irrigation, if spread uniformly over the land, would cover it to a depth of 8.5 feet. About two-thirds of this water is "excess," and it seeps toward the river and causes waterlogging and necessity for drainage.

Soil Properties

The texture, or size of soil particles, the permeability of soils to water, the thickness and extent of strata conveying water, the root-zone soil depths, and the soil structure or compactness — all of these are vital factors in drainage planning and success. Soils consisting largely of coarse sands and fine gravels may con-

Drainage was made by John Johnson, fre-
...
lons per minute per foot of drawdown of the ground-water surface.

It is a real and important problem to select the drainage method best adapted to each area and to obtain adequate drainage at reasonable costs.

Progress in drainage in Utah has been slow because of a lack of understanding by the public and by landowners of the perplexing problems involved.

Drainage Research

For fifty years the Agricultural Experiment Station has been active in conducting field studies to assist landowners and engineers in solving drainage problems. These studies have shown that each area to be drained presents a different problem and the physical characteristics of the terrain and the soil structure must be known before recommendations can be made on the drainage methods to be adopted.

Fig. 1. Typical open drain used extensively in some areas of Utah

A few examples of drainage problems and research conducted by the Experiment Station in some of these areas will help to clarify the needs for and procedures in this research.

In the Lewiston Area the question for many years has been, "Will pumping from deep wells facilitate land drainage at low costs?" Knowledge of the earth materials to a depth of 200 feet or more in this area was essential to answer this question. The Experiment Station drilled the first three deep wells in the area. Logs of these wells show but little gravel in only one well and therefore that deep-well pumping for drainage is not likely to be feasible.

Shallow-well pumping from coarse sands, however, is a promising method of solving Lewiston Area drainage problems, as shown by the water table lowering in fig. 4 and from several other shallow-well pumping experiments in the area.

In the Logan-Benson area of Cache Valley the Experiment Station has found that pumping ground water is feasible and provides adequate drainage. An experimental well yielded 4.5 cubic feet of water per second—enough to irrigate 400 acres. The permeability of the gravel aquifer is high; enough to yield 40 gallons per minute per foot of drawdown.

Recent tile drainage studies on the Logan-Cache Airport show the great importance of keeping excess water out of the compact, low-permeability, clay soils by good surface drainage, and pumping ground water, rather than having to draw it out of saturated soils.

Fig. 2. Open drain showing vegetation and sluffing

In waterlogged areas west of Springville and north of Salem in Utah County the question has been, "Is deep-well pumping the best method of solving drainage problems?" During October 1953, four wells were drilled by the Experiment Station in saturated saline soils to depths of 75 feet, and neither coarse sand nor gravel was found. The conclusion is that neither deep-well nor shallow-well pumping will solve the drainage problems in these areas.

Deep open gravity drains are not practical because of the caving of banks in the wet soils of low stability. Research is in progress to find how deep and close together tile drains, as shown in fig. 3, must be placed to solve the drainage problems in these areas.

Fig. 3. Concrete tile drain placed at shallow depth to be covered with gravel

Agencies For Drainage

Many Utah farmers with surveys and drainage system design assistance of Soil Conservation Service technicians, and with financial assistance from the Production and Marketing Administration have constructed drains for their farms. However, in many areas a drainage system for each farm is not practical; group action is essential. Some irrigation com-

(Continued on page 85)


Urbanization and Its Effect On Community Morale

By WILLIAM A. DEHART

During the decade from 1940 to 1950 Davis County nearly doubled its 1940 population. During this same period a number of the smaller communities in the county more than doubled their population, while Layton increased five times its 1940 size. The occasion for the increased growth was the extensive industrial development within and immediately surrounding the area. Growth of this magnitude has a potential disquieting effect on the morale of the citizens. The physical expansion of public and private services does not keep pace with immediate demands; churches and schools become crowded beyond their normal limits; highways are congested; and adequate housing is hard to obtain. The native resident not only witnesses the physical transformation of his community into an industrial center, but socially he finds the modes of living changing. An increasing secularization of a traditionally stable neighborhood society is set in progress and behavior patterns and moral values change. Chances are some may feel that the ordered life to which they have been traditionally dedicated stands threatened.

Certainly the migrant faces all the problems of the native citizen along with a few additional ones. He has likely severed his social and emotional ties with his kinship and friendship groups and now faces the challenge of re-establishing himself in a new and somewhat strange social setting.

Urbanization Brings New Services

Some of the changes, however, are certainly on the positive side. There is improvement in the economic activities of the community. New services such as health, welfare, education, and recreation are in the process of being established or expanded. New ideas are being transported into the community which provide a stimulus in overcoming some of the social inertia which often characterizes a relatively homogeneous self-contained community. A sense of pride develops where there is the feeling of constructive growth.

How the People Like the Changes

The feelings of the residents about the changes in Davis County were assessed by making the following statements:

I feel this is a very friendly community.
I feel that the moral standards are high in this community.
I feel there is a warm and Christian spirit in my community between members of my church.
I feel a high degree of community pride is to be found in my community.
I feel that the people in my community are law-abiding individuals.

The average person in this community really feels he belongs here.
I am proud of the business standards and ethics that prevail in my community.

For each of these statements the respondent was asked to report whether he strongly agreed, agreed, was undecided, disagreed, or strongly disagreed.

In general, the response to these questions was favorable. Some were undecided but few disagreed, indicating there was no widespread discontent in the area. The older residents (those in the community ten years or more) gave in general a more favorable response to the questions than the newcomers. In all instances there were more of the older residents who expressed strong agreement in reply to these questions.

Approximately 95 percent of the re-

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Table 1. Attitudes of old residents about the community in 1950 being a better place to live than it was in 1940

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>25</td>
<td>20.3</td>
</tr>
<tr>
<td>Agree</td>
<td>36</td>
<td>29.3</td>
</tr>
<tr>
<td>Undecided</td>
<td>26</td>
<td>21.1</td>
</tr>
<tr>
<td>Disagree</td>
<td>32</td>
<td>26.0</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2. The relation of the occupation of parent to the old residents' attitude toward his community

<table>
<thead>
<tr>
<th>Community is a</th>
<th>Business, professional, Farmer, Laborer, and clerical</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 years ago</td>
<td>percent</td>
</tr>
<tr>
<td>Agree</td>
<td>61.5</td>
</tr>
<tr>
<td>Undecided</td>
<td>15.4</td>
</tr>
<tr>
<td>Disagree</td>
<td>23.1</td>
</tr>
</tbody>
</table>

New well kept homes improve community morale
New industries and increased population provide an economic base for community development of such improvements as better churches, schools, new highways, expanded educational and welfare facilities, parks and other places of recreation.

Respondents felt there was a warm Christian spirit among their own church members. This was the most favorable reply. However, the existence of a warm Christian spirit between different churches received the most unfavorable response. Only about 70 percent expressed agreement to this statement.

The long-established residents were asked to express their feelings about the changes in the community since 1940. As to friendliness in the community and the existence of a warm Christian spirit in the churches, the older residents indicated there had been a slight improvement during the decade, for all the other questions they felt that conditions had deteriorated some.

The older residents were also asked how they felt about conditions in general as they remembered them in 1940. In response to this query, they indicated that the majority were more favorable to the conditions in the community as they existed in 1950 (table 1).

There seems to be a variation of opinion on the desirability of the over-all changes between different occupational groups (table 2). The white-collar workers, businessmen, professionals, and clerical workers were most favorable to the changes occurring in the past 10 years and the farmer least. Apparently the farmer has been most reluctant to see industry with its attending ugliness and urbanizing influence encroach on his domain. Somewhere in between was the laboring class. Only half could agree that conditions were better while 21 percent were undecided.

Although cases are too few for certain generalizations, there is evidence judging from table 3 that persons residing in specific communities felt differently about these changes. Only 13 percent of the people who came from the sample population in Layton felt that the changes had been for the better. The population in Layton increased five times. Perhaps there is a limit to what people can endure. The people in Clearfield, the second fastest growing town, were next in the order of expressing discontent with general conditions in 1950.

Table 3. The relation of community to the old residents' attitude toward their community

<table>
<thead>
<tr>
<th>Community</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bountiful</td>
<td>50.0</td>
<td>15.0</td>
<td>35.0</td>
</tr>
<tr>
<td>Clearfield</td>
<td>41.7</td>
<td>8.3</td>
<td>50.0</td>
</tr>
<tr>
<td>Layton</td>
<td>13.4</td>
<td>15.4</td>
<td>69.2</td>
</tr>
<tr>
<td>Kaysville</td>
<td>50.0</td>
<td>44.4</td>
<td>5.6</td>
</tr>
<tr>
<td>Other</td>
<td>62.5</td>
<td>22.5</td>
<td>15.0</td>
</tr>
</tbody>
</table>

Problems Creating Stress

With all the accompanying discomforts that industrialization brings in its wake, the total effect on a relatively homogeneous rural community is not all negative. But it is important enough to be the concern of social planners. Unless the problems creating stress are resolved, certainly community morale will decrease and social disorganization will follow. However, human beings develop various ways of dealing with problems of stress.

The disagreeable problems caused by expanding population may turn out to be a source of motivation leading to cooperation.

(Continued on page 87)
Pelleting
SWINE RATIONS SAVES FEED

By HYRUM STEFFEN

Advantages of Pelleting
Pelleting of feeds is not a new practice. Range sheep and cattle producers have used pellet-like feeds for many years and have valued them for the ease with which they could be handled and fed on the range with a minimum of wastage. In recent years the value of pelleted rations for swine has been investigated by a number of experiment stations. In general, these investigations show that pelleting a swine ration speeds up the rate of gain and results in a substantial saving in feed required to produce 100 pounds of gain.

Rations in Pellet and Meal Form Compared
During January to April 1953, the Utah Station compared rations for pigs

Table 1. Composition of ration and market cost of ingredients

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Percent</th>
<th>Cost of ingredient per 100 pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>50.0</td>
<td>$3.85</td>
</tr>
<tr>
<td>Barley</td>
<td>27.0</td>
<td>$3.50</td>
</tr>
<tr>
<td>Alfalfa meal (sun-cured)</td>
<td>10.0</td>
<td>$2.75</td>
</tr>
<tr>
<td>Soybean oil meal (41 percent)</td>
<td>7.0</td>
<td>$5.50</td>
</tr>
<tr>
<td>Meat scraps (50 percent)</td>
<td>5.0</td>
<td>$6.25</td>
</tr>
<tr>
<td>Iodized salt</td>
<td>.5</td>
<td>$1.80</td>
</tr>
<tr>
<td>Antibiotic, B12 supplement</td>
<td>.5</td>
<td>$50.00</td>
</tr>
</tbody>
</table>
in pelleted and meal form. Sixty-four pigs obtained from farms in the Cache Valley area were allotted at random into eight groups of eight pigs per group. Four of the groups received their ration in meal form and the others received the same ration pelleted. All were self-fed and water was kept available to the pigs at all times. The ration fed was considered suitable for Utah conditions and consisted of wheat as the principal ingredient, it being the most economical grain considering its relative feeding value, when the experiment was conducted. The composition of the ration and the market cost of the ingredients per hundredweight are given in Table 1.

The ration was mixed by a Logan feed company at a cost of $3.00 per ton. An additional $0.20 per ton was charged for pelleting. Considering all costs, the meal was valued at $4.29 per hundredweight and the pellets $4.49 per hundredweight.

Results

In this experiment 100 pounds of the pellets proved as valuable as 108.4 pounds of the meal. Based on the value of the meal replaced, each 100 pounds of the pellets was worth $4.65 or 26 cents more than they actually cost. Pigs receiving pellets gained 0.1 pound per day faster and required 32 pounds less feed per 100 pounds of gain. The advantage of pelleting was small when measured in rate of gain; however, the feed required per 100 pounds of gain by the group receiving pellets represented a real saving.

Waste of feed was not large among the pigs receiving the meal. There was practically no waste of the pelleted feed. Any pellets dropped by the pigs or rooted out of the feeders were easily retrieved by the animals.

The benefits of pelleting were not as large in this test as they have been in most experiments at other stations. Both rations were consumed with apparent relish and the pigs did little rooting in the feed. In an experiment at the Washington Station where waste feed was swept up and weighed, wastage by pigs receiving meal was 23 pounds in one lot and 16.9 pounds in a second lot during a 24-hour period. Pellets in the Utah test produced gains on 32 pounds less feed than did the meal. This compares with a saving of from 27 to 160 pounds elsewhere. Other stations have also shown greater differences in average daily gains in favor of pelleting. These differences range from 7 to 14 percent greater gains in the lots receiving pellets as compared to an advantage of 6 percent for pellets in the Utah test.

Pelleting Saves Feed

Considering all the evidence at this and other stations, it appears that pelleting of swine rations may be expected to achieve savings of feed sufficiently high to pay more than the cost of pelleting. Exceptions to this may be where the distance to a pelleting mill is long and will require excessive feed hauling costs. The North Dakota Station observed little benefit from pelleting corn rations which are relatively low in fiber. Greatest feed savings from pelleting may be expected where relatively unpalatable rations are used. Where highly palatable ingredients are mixed with others of low palatability, considerable wastage may occur from the efforts of the pigs to separate the two. Under such conditions pelleting may again result in substantial savings.

The increased rate of gain by pigs receiving pellets is also an important advantage. From 10 to 20 days less time may be required for pigs to reach market weight if pellets are fed rather than meal. This means less labor and other costs and may be highly important in obtaining a better market price, especially during a period of declining prices.

Pellets are readily fed in a self-feeder and relished by swine.
Point 4 technician admires Kentucky Wonder pole beans grown in variety garden at Karadj Agricultural College

For centuries, the gardens of Persia (Iran) have been immortalized in song and verse. These ornamental gardens, while contributing aesthetically to the life of many wealthy city dwellers, have done little to improve the lot of the millions of peasants. In the some 44,000 villages of Iran where malnutrition abounds, vegetables are practically unknown with the exception of the revered cucumber and an occasional onion.

Some explanations can be advanced for the lack of interest in vegetables. (1) Under the great landlord system which dominates Iranian agriculture, landowners are interested in planting crops that can be harvested in one operation and that are not conducive to pilfering during the growing season. They also want crops that can be easily sold for cash. In most areas of Iran, wheat fulfills these requirements. Hence, a large percentage of all available land and precious water is used for the growing of wheat with a complete disregard for the general health and well-being of the tenants. (2) The Iranian peasants, themselves, are unfortunately not conscious of the health-promoting properties of vegetables. Thus, they make little or no demand for more than the meager diet of bread and tea that most of the peasants live on 365 days a year.

Many Production Problems

For those few growers who raise vegetables for the city markets, the problems are many. In the entire country a reputable seed house is not to be found, and

DR. J. CLARK BALLARD, assistant professor of vegetable crops, returned October 1 from a two year assignment with the Point 4 program in Iran. While there Dr. Ballard was one of the most successful of the agricultural technicians in working with the Iranian officials and peasants. Reports, both from the Americans in charge of the program and from the Iranians, give high praise for his work and his ability to work with the peasants through learning their language well enough to talk to them.

Part of vegetable variety trial gardens in Iran. The row method of vegetable culture is a new undertaking

Point 4 Develops Program For Greater Utilization of Vegetables in Iran

By J. CLARK BALLARD
pure seed stocks have been non-existent. Until recently, growers were obliged to save their own seeds or buy them in the market from a merchant who has little or no interest in the seeds other than in selling them. The result is that almost any seed lot is a great mixture of various types, sizes, and maturities.

Americans are variety conscious; they know the various kinds of vegetables by variety names. This is not the case in Iran. Regardless of their attributes, local varieties are called “Iranian” while those from other lands are simply called “farangi” meaning that they are foreign. This being true, merits of superior varieties have not been recognized and many poor varieties are in use.

It is amazing to note that this country which has been engaged in agricultural pursuits since ancient times has not become acquainted with many important food crops. Prior to the recent technical aid programs such crops as sweet corn, sweet potatoes, lima beans, swiss chard, broccoli, stringless snap beans, head lettuce, chinese cabbage, kale, and parsnips had not been grown in Iran.

Other serious drawbacks to profitable vegetable production are: (1) primitive cultural practices, (2) lack of an insect and disease control program, (3) lack of facilities and program for the maintenance of soil fertility, and (4) inadequate transportation and marketing facilities.

Recognizing these multiple problems, Point 4 technicians, in cooperation with the Near East Foundation (a private organization engaged in rural improvement) and the Iranian Ministry of Agriculture have and are making progress toward their solution. Through their combined efforts, new crops and new cropping practices have been introduced in many areas of Iran.

Education Program Launched
As a first step in the promotion of both the culture and use of vegetables, local agricultural officials, landowners, and peasants have been made conscious of the role vegetables play in the maintenance of good health. This was done by holding short courses, by giving illustrated lectures to school and peasant groups, and by conducting field days at the many demonstration plots. Visual aids have also been used to promote the program.

To further the home garden idea, seeds were distributed and instructions were given for the growing and utilization of vegetables. The whole idea of growing vegetables for home use seems to be taking root and it is believed that vegetable culture will noticeably increase. This is evidenced by the fact that in many sections of the country landowners are making land available for the village gardens.

School Gardens
As a result of various training programs, rural school teachers began requesting assistance in establishing school gardens. Seeds of improved vegetables were provided and students were helped with the planning and planting of gardens. For many of the young people, this was their first experience with vegetable growing, but their response was good. It is reasonable to expect that these students later plant their own home gardens. In this way, vegetable production and use will receive some much needed support.

Variety Trials
Seeds of some fifty different varieties of vegetables were imported to Iran for testing. These included new varieties of the well known crops and some varieties of crops not previously grown in the country. These seeds were planted in demonstration gardens in most sections of the country. The trial gardens were planted in the best Western style. These proved most interesting to the local growers who visited the plots. The greatest similarity between these demonstration gardens and the local ones was that both grew the same weeds if not properly cared for.

American varieties of vegetables with few exceptions, have proved well adapted to Iranian climatic conditions. Based on trials from all sections of the country, a recommended list of varieties has been prepared. While many of the vegetables were well accepted by the local people, the following were especially outstanding: Wando peas, Golden Bantam sweet corn, Rival beans, Detroit Dark Red table beets, Comet radish, Fordhook lima beans, Long red tomato, Rhubarb swiss chard, and Blue Scotch kale.

Iranian agricultural workers were quick to notice such special merits as the mosaic resistance of Rival beans, the large well filled pods of Fordhook lima beans, and the heat tolerance of Wando peas.

They were also quick to point out the numerous spines and the bitterness of American cucumber varieties. This was the one vegetable that they openly condemned. Iranian cucumbers were found or be of higher quality than the imported varieties.

Point 4 technicians and Iranian workers observe a field of Golden Bantam sweet corn. Workers had removed the corn tassels thinking that this would keep all of the plant's strength in the ears.
DIETS OF UTAH SCHOOL CHILDREN

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the diets of the two groups of boys were not significant. The younger children, 5 to 9 years of age, of both groups had better diets than the older children (10 to 12 or 13 to 19 years) when average intakes were compared with the recommended allowances of the National Research Council. The older boys had better intakes of every nutrient than the girls. The 13- to 15-year-old girls had the poorest diets. Although average values for the intake of most of the children in the various age groups would indicate that the children of both groups were comparatively well fed, many individuals were not well fed. More of the girls aged 13 to 15 than any other age or sex group had poor diets; that is, intakes of many of the nutrients were less than two-thirds of the recommended allowances. Of all the nutrients, vitamin C was the one found most frequently deficient in the diet of all boys and girls (fig. 1). However, more of the older boys' and girls' diets were deficient in vitamin C than were the diets of the children under 10 years of age. Likewise, more of the 13- to 19-year-old children in the non-rheumatic group had diets which were deficient in vitamin C than did the children in the rheumatic-fever group.

Calcium and iron ranked next in frequency of deficiency for many of the older children. A greater percentage of the 13- to 19-year-old girls in the rheumatic-fever group had low calcium and iron intakes than in the non-rheumatic group. Twenty-five percent of the girls in the rheumatic-fever group of this age were also low in calories, protein, thiamine, and riboflavin. When the percentage of children who were eating diets which mer or considerably exceeded the recommended allowances was considered, the younger children were found that the local workers had removed all the corn tassels — so that the ears were beautiful but without kernels. The workers explained that they were concerned for fear all the plant's strength would go to the tassel leaving the ears without nourishment so they detasseled the corn. A thorough explanation about functions of tassel and ears prevented a reoccurrence in subsequent years.

Agricultural Outlook

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million. Estimates for 1953 based on the first 8 months of the year indicate a figure of about 12,750 million, or about 1 billion less than for 1952.

From 1935-39 to 1953 the number of persons employed in agriculture decreased about 20 percent. When adjustments are made for this and for changes in costs of living the changes in the real purchasing power of farm people can be had. Using 1935-39 as the base or 100, the per capita real income of persons engaged in agriculture rose rapidly from an index of 98 in 1940 to 195 in 1946 (fig. 2). Since 1946 it has gradually declined to an estimated 151 for 1953. Thus, the real per capita income of farm people has declined substantially. The extent of the decline has varied considerably among the different types of farming groups.

The above should serve to show that although the economic position of agriculture today is much better than during the depression period of 1935-1939, it is not as good as it was a few years ago. It has been declining for about two and one half years, and there is no certainty that the end has been reached. There are some factors that will have a further depressing effect and some that are encouraging.
Depressing Factors

(1) Perhaps the factor most depressing to agricultural prices is the large volume of agricultural production during the past decade. Spurred on by the favorable prices of the war years and aided by favorable growing conditions, agricultural output increased 20 percent from 1939 to 1942 (fig. 3). In 1948 and again in 1952 it amounted to 141 percent of the 1935-1939 average. The current year's production is now estimated at about 140 percent of 1935-1939. In comparison, the population of the nation, while increasing surprisingly fast, has increased only 24 percent since 1935-39. The demand for farm products, food and fiber almost exclusively, has definite limits. The organization and the nature of the farming industry are such that automatic and voluntary reduction of output is unlikely.

(2) Large farm production and other factors have led to the accumulation of large stocks of many basic farm products. The carry-over stocks of cotton, cattle, wheat, corn, soybeans, and dairy products are at or near all-time records. The presence of these large stocks will tend to depress natural market prices in the months ahead.

(3) These stocks have accumulated in part because of recent declines in export markets for our farm products. In a recent speech, Secretary Benson reported that "Our exports for 1952-53, it is estimated, were more than a billion dollars below the preceding year, a decline of some 28 percent." More recent data indicate that current exports are running 40 percent below last year. This decline may be accounted for by: (a) the recovery of agriculture in Europe and Asia from the ravages of war; (b) high yields in 1952 in other exporting countries; (c) shortages of dollar exchange in foreign countries; (d) availability of commodities in other countries at prices below the levels in the United States; and (e) less United States economic aid to foreign countries.

(4) There is uncertainty as to whether business in the United States can continue at the present level of activity. With cessation of the shooting war in Korea, reduced economic aid to foreign countries, and strenuous attempts to reduce government spending, some falling off of employment and business activity may result.
If this should happen, it would show up first of all in reduced demands for raw materials. The farms, the forests, and the mines provide the major sources of raw materials. Concern about the level of business activity is further heightened by the fact that the shortages of most consumer and producer goods that developed during the war have largely disappeared. At all points from manufacturer to consumer, inventories are gradually increasing and the backlog of unfilled orders is decreasing.

Encouraging Factors

(1) The lessons of the past lead one to conclude that the economic welfare of agriculture is influenced to a considerable degree by the level of business activity and incomes in the entire national economy. The current situation in this area is such as to lend support to agriculture. National employment is at or near the all-time high. Compared with a year ago, employment has substantially increased. With high employment and with wages at record levels and still rising, total personal incomes and also disposable personal incomes are at record levels. The financial capacity of the nation to buy farm products was never stronger.

(2) The favorable current income situation is supported by relatively large savings in cash, bank deposits, and government bonds. While the rate of current saving is not equal to that during some of the war years, it exceeds the past few years. Although consumer credit is running fairly high it is not large in relation to incomes. Consumers are probably better able now than ever before to maintain their customary levels of consumption even though incomes should fall.

(3) The farm debt situation constitutes another favorable area for agriculture. Following World War I, the farm mortgage debt in the United States reached nearly 11 billion dollars. At the present time, when the farm plant physically is larger and much better, when farm prices are higher and the value of farms much greater, the mortgage debt is only about 7 billion. The size of the farm debt has, however, been rising during the past few years. The ratio of debt to value is still low, 7.8 percent, as compared to 27 percent prior to World War II. The favorable mortgage debt is in part offset by a large non-real-estate debt. The non-real-estate debt on farms is probably the largest in history and is nearly equal to the real-estate debt.

(4) As a factor to support considerable business activity which in turn supports agriculture, there are currently large building activities. These are expected to continue for some time since there is still a considerable backlog of public, as well as private, industrial, business, and residential construction work. It is also fairly certain that a relatively high level of military spending will continue. Government farm programs and fiscal policies are also available to support extreme and disastrous slumps in the farm economy.

STAFF CHANGES

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Dr. Thorne on Leave

Dr. D. W. Thorne, head of the Department of Agronomy, was given a year's leave of absence beginning October 15 to accept the position of chief of the soils and fertilizer research branch of the Tennessee Valley Authority. In this position, Dr. Thorne will spend much of his time traveling to universities throughout the United States that have research projects sponsored by the Authority. His headquarters are in Knoxville, Tennessee. While Dr. Thorne is away, Dr. Howard B. Peterson is acting head of the Department, assisted in the crops phases of the administration by Professor William H. Bennett.

Milligan and Ballard Return from Iran

Clev H. Milligan, professor and head of the Department of Irrigation and Drainage Engineering, and Dr. J. Clark Ballard, assistant professor of vegetable crops, returned to the campus at the beginning of fall term from two years' leave spent in Iran on a Point 4 mission.

New Staff Members

New members of the Station staff include Reed Roberts, research assistant in bacteriology; Robert Zundell, research assistant in botany; Dr. Edna Page, associate professor of foods and nutrition; Otto Riethmann, research assistant in floriculture; Alvin A. Bishop, associate

84 Farm and Home Science
Dr. L. L. Madsen Heads Beef Cattle Investigations

Dr. Louis L. Madsen, immediate past president and former head of the Department of Animal Husbandry, has taken over the position as head of the beef cattle section, U. S. Bureau of Animal Industry. In this position Dr. Madsen will have charge of all beef cattle feeding, breeding, and management research for the U. S. Department of Agriculture at its various stations throughout the United States. His headquarters are at the National Agricultural Research Center at Beltsville, Maryland. Before coming to USAC Dr. Madsen was formerly nutritionist for the Bureau of Animal Industry for eight years.

DRAINAGE
(Continued from page 75)

companies have provided drainage for the lands they serve with water. Drainage by irrigation companies should be encouraged more and more.

Towns, counties, and some states have in recent years given some attention to drainage. Activity of these public agencies to develop essential drainage should have charge of all beef cattle feeding.

Dr. Alfred B. Stephenson, associate professor of physiology; and Dr. Thomas H. Bahr, associate professor of zoology.

professor of sociology.

Professor of Animal Husbandry, has taken over the position as head of the beef cattle section, U. S. Bureau of Animal Industry. In this position Dr. Madsen will have charge of all beef cattle feeding, breeding, and management research for the U. S. Department of Agriculture at its various stations throughout the United States. His headquarters are at the National Agricultural Research Center at Beltsville, Maryland. Before coming to USAC Dr. Madsen was formerly nutritionist for the Bureau of Animal Industry for eight years.

Financing Drainage Facilities

During the first half of the twentieth century financing of Utah drainage facilities was largely on a commercial basis. Motivated by urgent needs in World War I, many drainage districts issued bonds bearing 6 to 7 percent interest per annum, and sold the bonds at 10 percent or more below par value. This type of financing is prohibitive in cost. The United States Reclamation Law of 1902 provided non-interest bearing money and long-time loans toward construction of irrigation projects. Drainage projects in Utah and the West should be encouraged by similar inexpensive financing.

Utah can well afford to encourage advancement in drainage by providing funds at low-interest rates, or none at all, for many waterlogged areas. If drainage needs were the results of poor irrigation practices by owners of the wet lands only, then public financial subsidies for drainage might not be defensible. But, as previously stated, the irrigators of the higher lands contribute largely to the need for drainage of the lower lands.

The Utah public should assume substantial responsibility in the financing of drainage, comparable to the financing of drainage facilities by the United States under Production Marketing Administration activities.

In a recent cooperative study by the Experiment Station and the U. S. Soil Conservation Service, it was found that up to the 1920's, strenuous effort was made and notable success achieved by most drainage districts in meeting their financial obligations.

During the depression beginning in 1929, all drainage districts encountered extreme financial difficulties. Of the 23 districts that issued bonds, 7 failed and defaulted on their bonds; 8 liquidated at a fractional part of the outstanding debts, and 6 refinanced, receiving substantial write-offs on bonds. Only 2 districts paid out in full.

Despite these financial difficulties, the annual returns of the well-drained soils are generally recognized to be of great value to landowners, the counties, and the state. It is conservative to estimate the increased net annual income from 100,000 acres of adequately drained lands to be from 2,500,000 to 3,000,000 dollars.

MILK PRODUCTION
BY COUNTIES
(Continued from page 73)

creamery butter declined about a third and milk used on the farm declined about a fourth during these years.

In Utah there also has been a trend towards increased production of grade A milk, indicating milk producers in the state have been taking advantage of the higher prices obtained from the grade A market. Milk sold by Utah farmers to dairy plants is either grade A or grade C. Farm separated cream sold in the state is classified as grade C. For the past several years the sale of milk in Utah has been on the two-grade system depending upon the sanitary requirements under which it is produced. Requirements for grade A are more strict than for grade C milk. Only grade A milk can be used in certain products such as milk and cream sold to consumers in fresh liquid form, butter milk, skim, and chocolate milk beverages. Grade C milk is restricted in its use to so-called manufactured milk products such as cheese, evaporated and condensed milk,
ice cream, and butter. Data collected for 1952 show that farm-to-plant grade A sales represented 53 percent of the total milk sales while in 1948 only 39 percent of the milk sold from dairy farms to plants was grade A or market milk. Milk which was restricted to use in manufactured products declined from 61 to 47 percent of total farm-to-plant sales during this period (table 1).

Deliveries of milk from dairy farms in Utah to processing plants increased 51 million pounds from 1948 to 1952. Nearly 557 million pounds of milk and milk equivalent of cream were received at plants from Utah farms in 1952 as compared to 506 million pounds in 1948 (table 1). Cache County leads in milk sales to plants with about 19 percent of the total. Over 50 percent of Utah-produced milk sold to plants comes from producers in Cache, Utah, Box Elder, Weber, and Salt Lake Counties.

Grade A milk sales to plants from all dairy farms in Utah increased 48 percent from 1948 to 1952. While all counties in which grade A milk was produced showed an increase between these years, the rate of change varied greatly. The greatest percentage increases occurred in counties located a considerable distance from the urban areas of the state. Grade A sales in Sanpete, Millard, Uintah, Emery, Piute, Juab, Kane, Garfield, and Wayne Counties each increased 200 percent or more. Areas close to the large consuming centers did not increase their grade A sales so rapidly. However, dairy farmers in these counties were already producing a relatively high percentage of grade A milk in 1948. Sales to plants showed the least change in Summit County where only a 1 percent increase in grade A sales occurred from 1948 to 1952. Milk producers in 18 counties sold 40 percent or more of their milk to plants as grade A in 1952, compared to only 11 counties in 1948.

Utah County producers sell more grade A milk to plants than producers in any other county. Utah, Salt Lake, Weber, and Cache County producers in 1952 sold about 45 percent of all grade A milk sold to dairy plants in the state.

Table 1. Milk sales from farm to dairy plants by county of origin, Utah, 1948 and 1952

<table>
<thead>
<tr>
<th>County</th>
<th>Total milk receipts</th>
<th>Grade A milk receipts</th>
<th>Manufacturing milk receipts</th>
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<tbody>
<tr>
<td></td>
<td>Amount</td>
<td>Percent of state total</td>
<td>Amount</td>
</tr>
<tr>
<td></td>
<td>thousand lbs.</td>
<td>percent</td>
<td>thousand lbs.</td>
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<tr>
<td>Cache</td>
<td>91,953</td>
<td>18.1 18.8</td>
<td>11,907</td>
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<td>48,580</td>
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<td>Weber</td>
<td>39,977</td>
<td>7.9 6.7</td>
<td>25,986</td>
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<tr>
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<td>37,953</td>
<td>7.5 8.0</td>
<td>10,627</td>
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<tr>
<td>Salt Lake</td>
<td>32,892</td>
<td>6.5 6.2</td>
<td>30,261</td>
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<tr>
<td>Sanpete</td>
<td>27,852</td>
<td>5.5 5.2</td>
<td>5,010</td>
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<td>5.3 4.7</td>
<td>21,456</td>
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<td>5.2 5.2</td>
<td>10,526</td>
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<td>13,805</td>
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<tr>
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<td>61</td>
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<td>.1 .1</td>
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*Data for this study were obtained from the following sources: Statewide total milk receipts at dairy plants were obtained from the State Agricultural Statistician’s Office and adjusted to account for inshipments from Idaho and sales from Utah to Nevada plants. Receipts originating from each county were based on cow numbers, production per cow, and milk sales from farms in each county as shown by information prepared by the Department of Agricultural Economics, Utah State Agricultural College. Grade A and manufacturing milk receipts by counties were based on data and estimates obtained from county agents, dairy plant managers and fieldmen, state inspectors, and dairymen. Statewide total grade A and manufacturing milk receipts were used as a guide in estimating these receipts by counties.

86 F a m i l y and Home Science
URBANIZATION
(Continued from page 77)

tive planning and coordination of activities to find a satisfactory solution. New highways, churches, schools, business establishments, and expanded educational and welfare facilities begin to emerge. In these physical achievements, the community develops a sense of pride. Improvement in the economic affairs of the community makes possible improvements in living standards and provides an economic base for community development.

If an accumulation of experience could be obtained on community growth as it affects community morale, intelligent planning dictated by such experience could go a long way in improving the physical development and social adjustment of the people living in and moving to rapidly expanding communities.

NEW PUBLICATIONS


This bulletin considers the important management factors that influence sugar beet yield and quality and the interaction of these factors on each other. The results of the research reported here show that to obtain high yields of good quality sugar beets, proper plant spacing, adequate fertilizer, and timely irrigation practice must be combined with early planting and weed control. Yields of not less than 20 tons per acre can readily be obtained in the Great Basin area if these practices are followed.


This bulletin evaluates butyl fabric as a lining material to prevent seepage losses from irrigation canals. The authors believe that the material holds promise in use as a flexible pipe for conveying water rather than for ditches where it deteriorates under mechanical damage such as caused by livestock crossing the canal.


This bulletin reports studies on halogeton infested ranges to determine the conditions associated with livestock poisoning. It was found that it required 12 ounces of halogeton containing 8.7 percent soluble oxalates to cause death in a fasting animal. It required 18 ounces to cause death in an animal with a normal fill. It was concluded that halogeton-infested ranges can be grazed without abnormal losses if livestock operators learn to identify the plant and practice good range and livestock management.

Bul. 365. Costs, quality, and prices of fluid milk in rural and urban areas of Utah and Montana, by Wells M. Allred and Edward H. Ward. Department of Agricultural Economics in cooperation with the eleven Western States and the U. S. Department of Agriculture. A Western Regional Publication.

Costs of processing and delivering fluid milk and other dairy products by small and medium-sized dairy plants in outlying communities and urban areas of Utah and Montana are reported in this bulletin. Unit costs of processing averaged much higher in small plants than in the larger dairies.


This publication reports experimental attempts to drain lands in the Lewiston Area in northern Cache County, Utah, and recommends open drains, tile drains, and shallow-well pumping as successful means of drainage in the area.

Single copies of these publications may be obtained free from the Utah Agricultural Experiment Station, Logan.

Rapid growth creates housing problems and newcomers are forced to use makeshifts.

The emergency of community problems provides a potential motivational base for more intensive community action. Social organizers and planners in rapidly growing communities should use all the positive potentials in community growth to stimulate more effective participation of the citizens in the affairs of the community.

RESEARCH
(Continued from page 88)

U. S. Department of Agriculture and on the land-grant colleges to step up their research and educational programs that solutions may be found to the problems of agriculture. At the meetings of the Association of Land Grant Colleges held in Columbus, Ohio, during November, he outlined three areas in which he thinks the land-grant colleges have a special opportunity to enlarge their services to American agriculture. "I choose these areas," he said, "because they are new, because they are important, and because they are difficult. These three areas are: (1) balanced farming, (2) marketing, (3) public policy." To put such a program into effect, Congress will be asked for additional funds both for the land-grant colleges and for the Department of Agriculture. The job ahead for research is one that has tremendous responsibility. But the Department of Agriculture and the state experiment stations working cooperatively have the trained personnel and facilities to assist in solving the problems facing agriculture. The opportunities for service are unlimited.
Research Basic to Solution of the Farmers' Problems

The solution to the problems of the farmer lies in research and education in the production, processing, marketing, and utilization of farm products and in the problems of rural living, maintains Secretary of Agriculture, Ezra Taft Benson. Thus the land-grant college system must become better organized and more adequately equipped to serve the farmer. In the land-grant colleges this implies a more extensive research program, the making of the research results meaningful to the individual farmers and farm organizations through the extension service, and the education of young farmers in the colleges.

Extension of both basic and applied research is needed if American agriculture is to be prosperous. The problems of modern farming are more and more demanding solutions which are increasingly complicated. Basic research has been the foundation of all the really big advances in agriculture. Mendel's basic discoveries in plant genetics laid the foundation for hybrid corn. But it took more than 60 years after Mendel's work for hybrid corn to become a reality. Even after all the facts on hybrid corn were known, it wasn't until 10 years later that a sufficient number of farmers were planting hybrid corn to make a substantial difference in acre yields. Today, use of hybrids is almost universal.

If we are to look forward to continuing progress, it is necessary to provide more adequately for research in the fundamental sciences upon which agriculture rests. Basic research, by delving into the causal relationships, is the source of new principles for the further improvement of our soils, our plants, and our livestock.

To solve other pressing problems of modern agriculture, it is mandatory to realize the need of balancing total farm production with the kinds and amounts of products consumers want and will buy at equitable prices. This involves marketing and utilization research. We need research on how to preserve farm-fresh quality and nutritive value of products on their way to market. We must find economical uses for the millions of tons of waste products. We need to expand research on the development of new products from agricultural raw materials, new uses for existing materials, and new processes that will expand present markets. In the words of Secretary Benson, "Larger recognition should be given to the importance of research in safeguarding farm markets. Expenditures for industrial research on many products which are in direct competition with farm products have far exceeded expenditures for agricultural research. New uses, new qualities, new selling points have enabled industrial products first to invade, and then largely take over, markets that once were major outlets for farm commodities. We do not propose to see farm products researched 'out of their markets in the future as they have been in some instances during the past century.'"

Secretary Benson is calling both on the

(Continued to page 87)