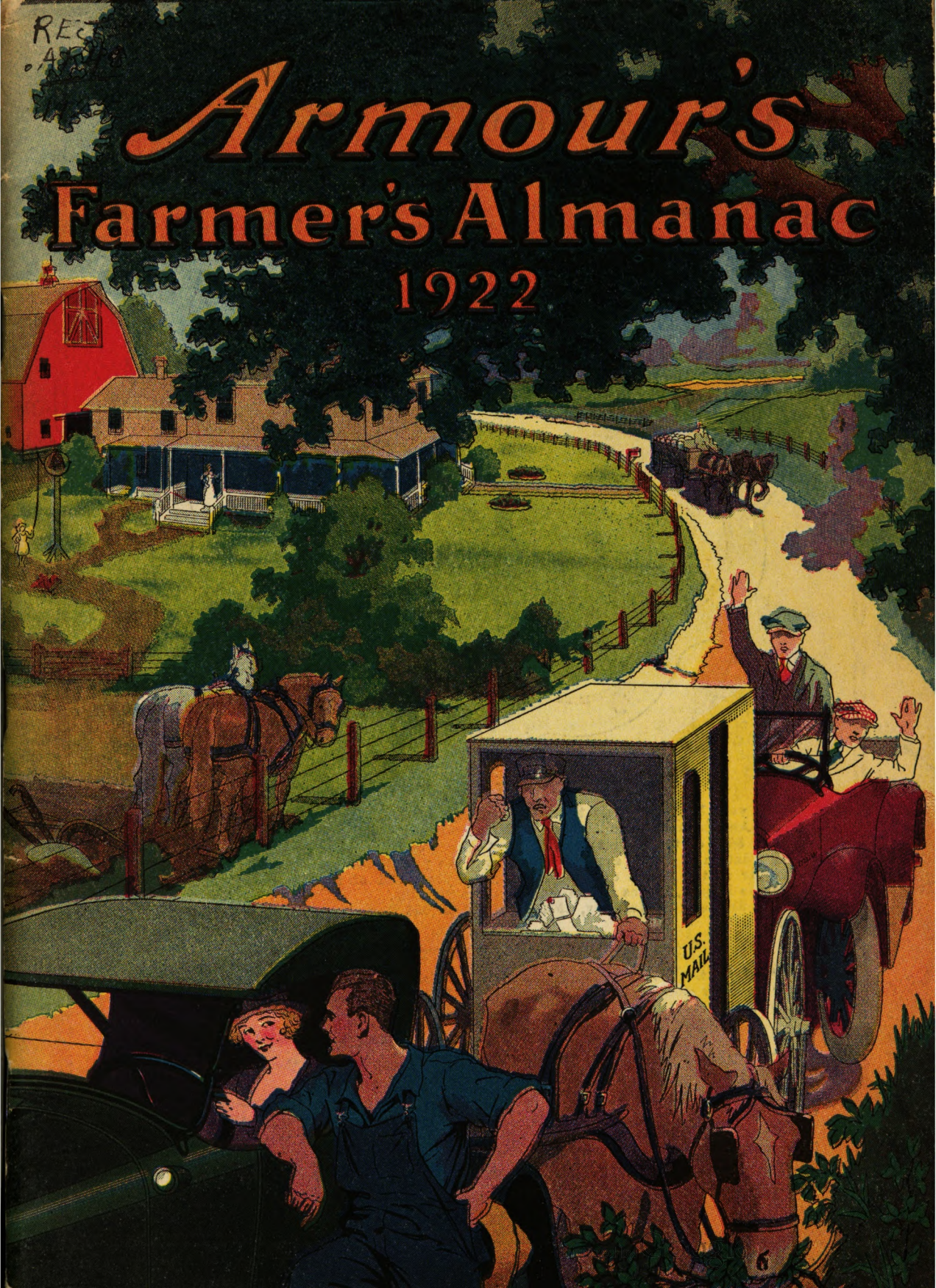
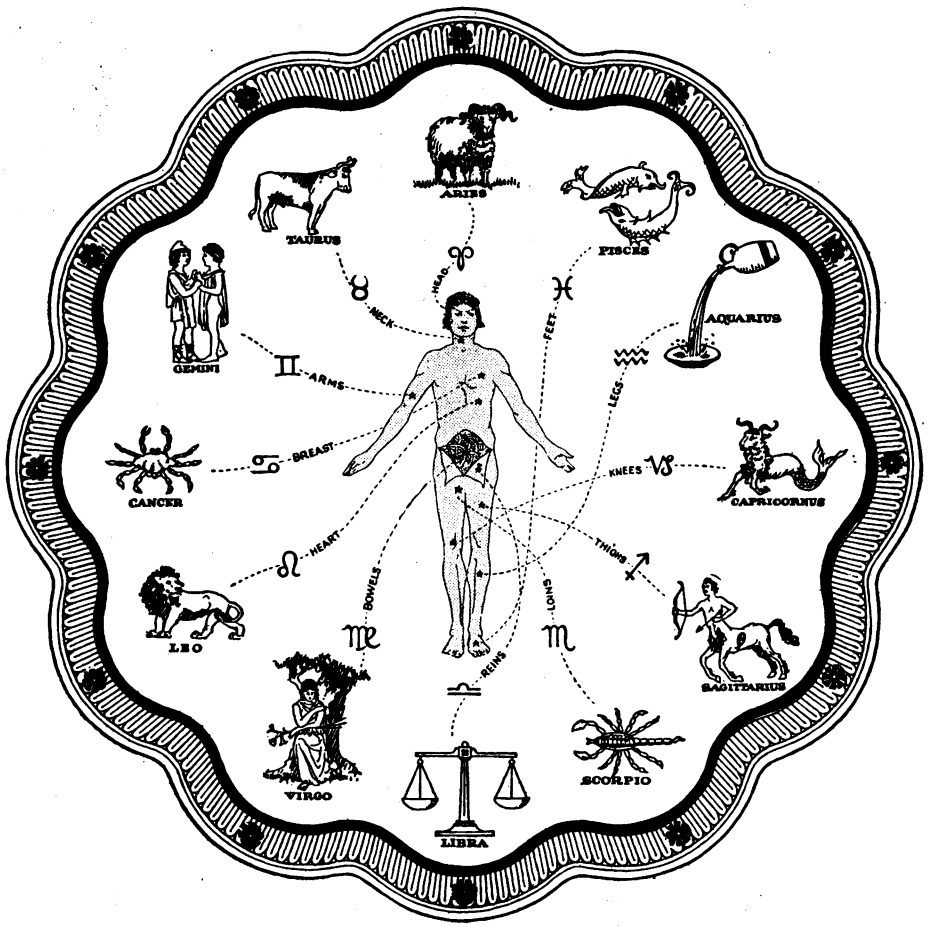

Armour's
Farmer's Almanac
1922
U.S. MAIL



ALMANAC CALCULATIONS FOR 1922

The year 1922 comprises the latter part of the 146th and the beginning of the 147th year of American Independence and corresponds to: the year 6635 of the Julian period; the year 5683 of the Jewish era begins at sunset on September 22nd; the year 2675 since the foundation of Rome, according to Varro; the year 2582 of the Japanese era and to the 11th year of the period entitled Taisho; the year 1341 of the Mohammedan era, or the era of the Hegira, begins at sunset on August 23, 1922.

The first day of January, 1922, is the 2,423,056 day since the commencement of the Julian period.

CHRONOLOGICAL CYCLES, 1922

Dominical Letter	A	Solar Cycle	27
Lunar Cycle or Golden No.	4	Roman Indiction	5
Epact	2	Julian Period	6635

MORNING AND EVENING STARS, 1922

The Planet Venus (♀) is Morning Star to February 9th and then Evening Star until November 25th and Morning Star from then to end of year.

The Planet Mars (♂) will be Morning Star to June 10th and Evening Star balance of year.

The Planet Jupiter (♃) begins as Morning Star and continues as such until April 4th, is then Evening Star to October 23rd, and Morning Star to end of year.

The Planet Saturn (♄) is Morning Star to March 25th, then Evening Star to October 4th, and Morning Star balance of year.

Armour's 1922 Farmer's Almanac

Concerning Almanacs and Weather

Nearly 200 years ago Benjamin Franklin appears to have been criticised for including weather forecasts in his almanac, even as we will be tomorrow, and therefore in presenting again to you the weather forecasts of Mr. H. B. Gathright of Goochland, Virginia, we quote in part the preface to the 1737 edition of Poor Richard's Almanack:

"However we Almanack makers may miss it in other things, I believe generally it will be allowed that we always hit the day of the month, and that I suppose is esteemed one of the most useful things in an Almanack.

"As to the weather, if I was to fall into the method my brother J——n sometimes uses, and tell you, 'Snow here, or in New England'—'Rain here, or in South Carolina'—'Cold to the Northward'—'Warm to the Southward,' and the like, whatever errors I might commit, I should be something more secure of not being detected in them: but I consider it will be of no service to anybody to know what weather it is 1,000 miles off, and therefore I always set down positively what weather my reader will have, be he where he will at the time. We modestly desire only the favorable allowance of a day or two before, and a day or two after the precise day against which the weather is set:—and if it does not come to pass accordingly, let the fault be laid upon the printer, who, 'tis very like, may have transposed or misplaced it, perhaps for the conveniency of putting in his holidays: and since, in spite of all I can say, people will give a great part of the credit of making my Almanacks to him, 'tis but reasonable he should take some share of the blame."

Cartoons "The Changing World"

Drawn by John T. McCutcheon

Armour Fertilizer Works

CHICAGO, ILL.

1921—A Year of Lessons

By CHARLES H. MacDOWELL
President of the Armour Fertilizer Works

Nineteen twenty-one was a disastrous year for the farmer as well as the fertilizer manufacturer. The demoralization in the price of farm products had an immediate effect on the demand for fertilizers. Materials accumulated for the year's business were unusually expensive; the labor used in the Fall and early Winter of 1920-21, manufacturing Spring goods, was paid the peak of high wages; the shrinkage in tonnage more than doubled the per ton cost of manufacturing, overhead and selling; freight rates, both on incoming materials and outgoing finished products, were increased from 25% to 40%; large inventory losses were taken on materials and goods carried over, and the industry sustained losses running into many millions of dollars. The farmer suffered likewise.

The consumption in the North was about 65% of normal, while in the South, where a greater portion of our fertilizer is consumed, it was only 50%. This reduction in tonnage was reflected in the cost of the goods, even though the most rigid economies had been practiced.

With agricultural conditions stabilized, a decided reduction in freight rates, and a normal consumption, we may expect the cost of fertilizer to be materially reduced.

Goods of low analysis were called for in many sections, the price per ton making them attractive. The value of a ton of fertilizer is based on units or percentage of plant food it contains, and not pounds. The more units the consumer can get per ton the lower the cost per unit.

In the South the planter who used his usual tonnage of high-grade fertilizer, properly nourishing his crop, obtained, notwithstanding unfavorable weather conditions, good yields of cotton and the plant did not suffer materially from the boll weevil. Where little or no fertilizer was applied, the boll weevil damage was serious and further, where there was no weevil damage, yields were small, showing the lack of crop feeding. It has been thoroughly demonstrated that liberal applications of high-grade fertilizers hasten the growth and maturity of crops, as well as increase the yield. Plants, sickly and undernourished, are more subject to the ravages of disease than husky, well-fed plants. It is the same with plants as with farm animals. This is a benefit obtained from balanced ration fertilization which escapes the observation of many farmers. Its importance will be realized more and more as time goes on.

Some of our learned friends have been "kidding" us about our weather forecasts. In fact, several scientific magazines have commented with surprise on the inclusion of these forecasts in an almanac of the general character of our publication. It would seem that Benjamin Franklin, in his time, was also criticized for venturing to forecast the weather. We cannot but feel, however, that an almanac without a weather prophecy would be incomplete. We are, therefore, continuing the prophesies for the coming year so our readers will preserve the Almanac, consult the forecasts from time to time, and, what is more to the point, re-read the various articles on agricultural subjects prepared by those who know.

Farming as a Business

By Frank D. Gardner, Professor of Agronomy, Pennsylvania State College, State College, Pa.

FARMING calls for the best there is in men who, by education and experience, have prepared for the business. No other calling demands so great a diversity of knowledge and none presents problems more difficult to solve. In the nineteenth and preceding centuries, farming was a mere matter of manual labor. In the twentieth century, it is a business. It demands the application of sound business principles to the same extent as does merchandising and manufacturing. Farm management and rural economies are now important subjects. The application of these subjects to the business of farming is imperative.

Prices of farm products are below normal today, largely because 5,000,000 laborers in the United States are unemployed. There is no hope for any advance in prices of farm products until labor is employed. There should be a demand for those products. Farm prices will go lower unless consumption is stimulated.

Labor organizations are striving to maintain the abnormal high wage paid during the war. This high wage is now reducing the demand for labor. It is hampering business in nearly all lines. A high wage and half-time employment curtails production. It increases the price of necessities to the laborer. A reduced wage, full-time employment and a reduction in the price of necessities would be decidedly to the advantage of the laboring classes and to all others. It would be a great improvement over the present situation.

With the farmer, the problem is largely one of hard work and good business management. The farmer who farms well, breeds and feeds good livestock economically, employs extra labor only when each dollar so expended will bring something more than a dollar in return and buys only what he needs, will make a profit. The farmer who ignores this doctrine is likely to get into serious trouble financially.

The table on this page, copied from the Monthly Crop Reporter, published by the United States Department of Agriculture, in March, 1921, shows the trend of prices for the items named in the table heading for the years 1909 to 1920, inclusive. The figures are based on the five-year average price, 1909-1913, taken as 100, and show a decided upward trend of prices in 1917-18 and 19.

Continued on page 21

Trend of Prices of Commodities Bought and Sold by Farmers

	Land Values	Farm Wages	Crop Prices	Live Stock Prices	Crops and Live Stock	Crop Values per Acre	Articles Farmers Buy	Crop Yield per Acre
1920	184	240	195	183	189	148	223	107
1919	202	207	221	212	217	232	212	102
1918	167	176	212	211	211	212	188	100
1917	153	142	198	181	189	209	153	104
1916	136	114	124	122	123	142	125	97
1915	123	105	101	104	102	108	112	110
1914	111	104	101	112	107	103	103	105
1913	109	105	98	110	104	104	103	95
1912	103	102	101	98	100	101	102	110
1911	99	99	101	90	96	97	100	93
1910	96	95	99	108	103	98	99	101
1909	93	98	101	95	98	101	97	101

Note that prices of farm products were very high in 1917-1918 and 1919 and declined sharply in 1920. In 1921 they are much lower than in 1920. Note also that, notwithstanding this decline in farm products, there was a further increase in the cost to the farmer of labor and articles that he buys. It was this discrepancy that made it especially difficult for the farmer in 1920 and continues to make it so in 1921.

Fertilizers Increase Corn Yields

By G. I. Christie, Director Agricultural Experiment Station, Purdue University, LaFayette, Indiana

HOW to secure larger yields of better corn at a lower cost per bushel is the important problem before corn growers. High-priced corn-belt land must produce large and profitable crops each year. At the same time, methods and a cropping system must be followed which will maintain and increase the fertility of the soil. These questions have had the consideration of the State Experiment Stations and Corn Growers' Associations.

The average yield of corn in the corn-belt states is too low. The ten-year averages, 1911-1920, are as follows: Iowa, 37.3 bushels; Illinois, 33.8 bushels; Indiana, 36.4 bushels; Ohio, 39.2 bushels; Nebraska, 24.5 bushels; Missouri, 26.0 bushels; Kansas, 16.2 bushels. Individual farmers in these states are growing an average of sixty, seventy and eighty bushels of corn per acre every year. In order to secure the low average yield indicated for the various states, other farmers must have grown fifteen, twenty and twenty-five bushels of corn per acre, which is unsatisfactory and most unprofitable.

Testing Corn Possibilities

With the idea of determining the possibilities of corn production, the five-acre corn contest was inaugurated in Indiana. The question, is 100 bushels per acre possible and practical on Indiana farms, was first raised. The theoretical answer was as follows: On an acre of ground planted with rows 3½ feet apart each way there are about 3,500 hills. If each hill would produce two stalks of corn, each bearing an ear weighing one pound, the production would reach 7,000 pounds of corn or, at 70 pounds per bushel, 100 bushels of corn per acre.

The next step was to determine the actual yields under field conditions. The results of the contest show that *farmers can produce one hundred bushels of corn per acre.* The following is a record of the number of men who have won gold medals for growing 100 bushels or more per acre since the contest was started in 1914:

Year	Number Gold Medals Won
1914	21
1915	1
1916	1
1917	5
1918	4
1919	24
1920	47

In 1920 three hundred twenty-five farmers grew 75 or more bushels per acre and 47 of this group of men grew more than 100 bushels per acre. Almost invariably these men are following good farming methods including a sound system of soil management. The second highest yield in the contest, 127 bushels per acre, was produced on reclaimed acid peaty sand soil by the use of limestone and complete fertilizer. Ten years ago this same land could have been bought for thirty dollars per acre.

For many years the Department of Soils and Crops of the Purdue Experiment Station has been conducting experiments to determine the best fertilizers to be applied to corn. As a result of these investigations, there has been developed a plan of soil management which gives maximum yields at the lowest possible cost. This plan is kept in mind at all times in making recommendations concerning the use of fertilizers. It involves the growing of legumes to supply a large part of the nitrogen; the use of lime where needed to correct soil acidity, and the application of available plant food—nitrogen, phosphoric acid and potash—in accordance with the needs of the crop and the deficiencies of the soil.

Fertilizer With Manure Is Valuable

We have found that manure usually pays best when applied to corn land and that the highest returns per ton of manure are secured from relatively small applications—not more than six tons per acre. It pays to use 250 to 500 pounds of acid phosphate or mixed fertilizer in addition to manure, depending upon the nature of the soil and its previous treatment. The application of 1,000 pounds of acid phosphate in addition to eight tons of manure on the Bedford Experiment Field in 1916 has given an annual increase of 15.6 bushels of corn, and the increase in 1920 was 16.1 bushels, showing the lasting effect of the fertilizer.

Where Fertilizer Is Most Needed

But the larger share of the land in the corn-belt receives little or no manure. It is on these soils that the need for fertilizer is greatest. In the Purdue experiments the use of fertilizers has usually been very satisfactory. On account of the great variation in soil types it does not seem advisable to give average figures for a number of fields, but some of the results obtained on individual fields should be of interest. At Scottsburg in southeastern Indiana, complete fertilizer used in addition to ground limestone

Continued on page 30

CORN AND VELVET BEANS—grown by Young & Edgerly, Albany, Ga. 250 lbs. per acre of Armour's BIG CROP 9-3-3 Fertilizer used. Corn yielded 55 bushels per acre

SILAGE CORN — plot to left unfertilized Yield, 2 tons silage per acre Plot to right fertilized. Yield 14 tons silage per acre.
—*Courtesy Wisconsin Experiment Station*

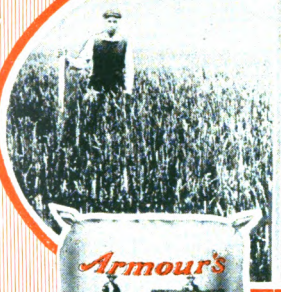
CORN—240 acres grown by F. D. Bollman, Princeton, Illinois, on muck soil. Fertilized with Armour's BIG CROP 1-7-10 Fertilizer The first satisfactory crop in four years The short rows to the left unfertilized.

CORN—the production from a a plot receiving Complete Fertilizer and Lime. Yield, 66 bushels per acre.
—*Courtesy Indiana Experiment Station*

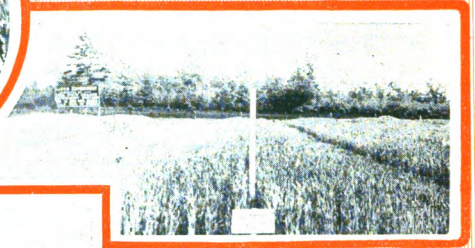
CORN—2 rows of unfertilized corn to the left of the fertilized corn on farm of F. D. Bollman, Princeton, Illinois. Picture taken in early July before corn had tasseled.

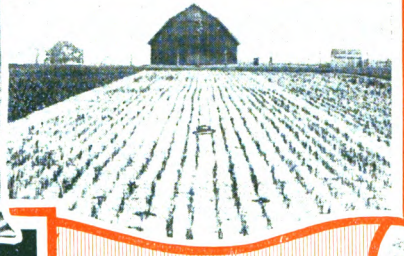
CORN—newly planted. The plot at the left received Complete Fertilizer and yielded 72.3 bushels per acre and plot at the right had no treatment, yielded 30.3 bushels per acre.
—*Courtesy Indiana Experiment Station*

WINTER WHEAT—Grown on farm of Cortis Ray, Greensburg, Indiana. Fertilized with Armour's BIG CROP 2-12-2 Fertilizer. Yield, 22 bushels per acre, reduced by extreme heat and drought.

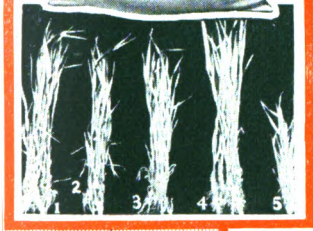


WINTER WHEAT—
no treatment on left field. 200 lbs. Acid Phosphate per acre used on right field.
—Courtesy Wisconsin Experiment Station





WINTER WHEAT—Complete Fertilizer and Lime used on center plot. The plot on the left received no treatment.
Courtesy Pennsylvania Experiment Station



YOUNG WHEAT PLANTS—The results of different fertilizer treatments, left to right
1—Acid Phosphate only.
2—Nitrogen and Available Phosphoric Acid
3—Available Phosphoric Acid and Potash.
4—Complete Fertilizer.
5—No treatment.
—Courtesy Ohio Experiment Station

WINTER WHEAT—newly planted—no treatment.
—Courtesy Delaware Experiment Station

WINTER WHEAT—newly planted. Complete Fertilizer used. Vigorous growth that will withstand winter killing.
—Courtesy Delaware Experiment Station

WINTER WHEAT—grown in Indiana. Left, received Complete Fertilizer, Lime and Crop Residues. Yield, 22.7 bushels per acre. Right, received Lime only. Yield, 7.5 bushels per acre.
—Courtesy Prof. Wiancko Indiana Experiment Station

Fertilizing Wheat

By A. T. Wiancko, Department of Soils and Crops, Purdue University Agricultural Experiment Station

OW shall we fertilize the wheat crop and can we do so at a profit? These are questions of importance to every wheat raiser no matter what his type of soil or what his system of farming. Thousands of farmers are raising wheat at a loss every year. Other thousands, by proper methods, are securing good yields and netting handsome profits. The difference is partly due to natural conditions but more largely to the methods employed and especially in the matter of soil treatment. The good wheat raiser knows the needs of the crop and how to supply them and produces good crops on the same kind of soil where his careless neighbor doesn't make the cost of production.

Of all the ordinary farm crops, wheat responds most generally to proper fertilization. In other words, wheat will yield better returns than most crops for money spent for the right kind of fertilizer. Evidences of this are plentiful in the records of our experiment stations and wherever yield determinations have been made.

Plant Food Requirements of Wheat

A 30-bushel wheat crop requires for the grain and straw about 43 pounds of nitrogen, 18 pounds of phosphoric acid and 30 pounds of potash. This is only about half as much plant food as is required by a 60-bushel crop of corn. It is, therefore, much easier to feed a crop of wheat than a crop of corn.

There is one source of nitrogen of which farmers should make greater use, viz., by growing more of legumes; through certain kinds of bacteria associated with them they have the power of collecting nitrogen from the air. By growing clover once every three or four years, returning the manure made from the hay and other crops fed with it, and plowing under the second growth clover, much of the nitrogen needs of most crops could be taken care of and it should be necessary only to supply enough nitrogen in fertilizer to give the crop a good start. Unfortunately this is not done to a sufficient extent. On the average, there is only about one-third or one-fourth as much clover grown as should be grown and most soils are becoming more and more depleted of their fertility. This is one of the chief reasons why average wheat yields in this country are so small.

The phosphorus required by crops must all come from the soil and since our principal soils are already deficient in phosphorus, this element must be supplied in the form of manure or fertilizer. Since the manure is usually applied for corn, the full phosphorus requirements of the wheat crop should be supplied in the form of fertilizer. And not only that, but enough should be applied in the wheat fertilizer to supply the needs of the clover which should always follow. This can be done at a good profit.

Most soils, except mucks and very sandy loams, contain considerable stores of potash, if they could only be made available. The trouble in most cases is that only a small amount is in available form at any one time. However, in good systems of farming where most of the crops are utilized on the farm and the manure and crop residues returned to the land, some of the potash requirements can be supplied from the soil and the balance provided in fertilizer. But where crops are sold and only small amounts of manure are used, considerable fertilizer potash may be required to produce maximum crops. Under average conditions, manure and crop residues are not utilized to the fullest extent.

Wheat After Corn Needs Most Fertilizer

When wheat follows corn in the rotation more liberal fertilization is needed than when it follows oats or some other summer harvested crop. This is due to the fact that the immediately available plant food in the soil has been reduced to a minimum by the corn which has been growing almost up to wheat seeding time. This disadvantage to wheat or corn ground should always be recognized by giving it an especially liberal application of fertilizer.

In unfavorable seasons and when diseases or insect injury is severe, well fertilized wheat may make a fair yield when unfertilized wheat would be a failure. In 1919, one of the experiment fields in Indiana where winter-killing, scab and Hessian fly injury were very severe, the fertilized wheat made 12.4 bushels per acre while the unfertilized wheat produced less than one bushel. The stronger growth induced by the fertilizer gives the crop large powers of resistance to unfavorable circumstances and it is a common experience that the benefits derived from fertilizer are greater in poor wheat years than in good years when even poor land may make a fair crop. Whenever it is necessary to sow late to avoid the fly it is all the more important to fertilize well in order that the crop may go into the winter in good condition.

The Indiana Experiment Station is operating soil fertility experiment fields on a number of representative soil types in different parts of the state. On six of these

Continued on page 20

January

1st to 10th—Very unsettled conditions from California to Oklahoma and Kansas. Wind and rain in states of Gulf and South Atlantic borders. Snow in northwest.

11th to 20th—Pleasant conditions at most points west of the Mississippi river. Snow storms over New York and New England. Damp, windy and unsettled weather general in eastern sections.

21st to 31st—High winds with dashes of rain and sleet in Texas, Oklahoma, Arkansas, Kentucky, Tennessee and the Carolinas. Cold and blustery over Great Lakes and the Northwest. Generally fair weather over southern and eastern parts of the country.

The temperature will be above the January average. The precipitation will be above normal over the Northwest and Middle West, below average elsewhere.

Moon's Phases — Eastern Time

	D.	H.	M.
First Quarter	6	5	24 M.
Full Moon	13	9	36 M.
Last Quarter	20	1	0 M.
New Moon	27	6	48 A.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES: Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of MIDDLE STATES: Sun rises H.M.	Sun sets H.M.	Moon r. & r. H.M.	Latitude of SOUTHERN STATES: Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.
1	S	New Year's Day		7 30	4 37	8 11	7 24	4 43	8 15	7 3	5 4	8 25
2	M	Arrest 200 radicals Chicago, '20		7 30	4 38	9 11	7 25	4 43	9 13	7 3	5 5	9 20
3	T	Ld. Roberts heads Brit. army, 1901		7 30	4 39	10 10	7 25	4 44	10 12	7 3	5 6	10 14
4	W	Many Reds caught in N.Y.,1920		7 30	4 40	11 9	7 25	4 45	11 8	7 3	5 7	11 6
5	T	Earthquake in Mexico, 1920		7 30	4 41	morn	7 25	4 46	morn	7 3	5 7	morn
6	F	Epiphany		7 30	4 42	0 6	7 25	4 47	0 4	7 3	5 8	0 1
7	S	Sir Edmund Barton died, 1920		7 30	4 43	1 6	7 25	4 48	1 4	7 4	5 9	0 56
8	S	First Sunday after Epiphany		7 30	4 44	2 8	7 25	4 49	2 5	7 4	5 10	1 53
9	M	Earthquake in Italy, 1915		7 29	4 45	3 10	7 24	4 50	3 7	7 4	5 11	2 51
10	T	Annexation of Texas, 1815		7 29	4 46	4 13	7 24	4 51	4 9	7 4	5 11	3 51
11	W	Rev. Hunter Corbett died,1920		7 29	4 47	5 16	7 24	4 52	5 10	7 4	5 12	4 51
12	T	300 die in Mexican quake, 1920		7 28	4 48	6 15	7 24	4 53	6 9	7 4	5 13	5 49
13	F	Liberty Pole felled by Brit., 1770		7 28	4 49	rises	7 24	4 54	rises	7 3	5 14	rises
14	S	Earthquake in Jamaica, 1907		7 28	4 50	6 33	7 23	4 55	6 36	7 3	5 15	6 50
15	S	Second Sunday after Epiphany		7 27	4 51	7 48	7 23	4 56	7 50	7 3	5 15	7 59
16	M	River and Harb. Bill passed,'01		7 27	4 52	9 2	7 22	4 57	9 4	7 3	5 16	9 8
17	T	Nat'l Prohibition effective, 1920		7 27	4 53	10 12	7 22	4 58	10 12	7 3	5 17	10 12
18	W	Daniel Webster born, 1782		7 26	4 55	11 24	7 21	4 59	11 22	7 2	5 18	11 17
19	T	West Point abolished hasing,'01		7 26	4 56	morn	7 21	5 1	morn	7 2	5 19	morn
20	F	Fire in Clarksburg,W.Va., 1911		7 25	4 57	0 35	7 20	5 2	0 32	7 2	5 20	0 23
21	S	Actor Sothern died, 1880		7 24	4 58	1 41	7 20	5 3	1 37	7 1	5 21	1 23
22	S	Third Sunday afte. Epiphany		7 24	5 0	2 44	7 19	5 4	2 39	7 1	5 22	2 24
23	M	MasimPasha assassinated, 1913		7 23	5 1	3 44	7 19	5 6	3 39	7 1	5 23	3 20
24	T	Ger. Cruiser Blucher sunk, 1915		7 22	5 2	4 39	7 18	5 7	4 33	7 0	5 24	4 14
25	W	Michigan admitted, 1837		7 21	5 3	5 29	7 17	5 8	5 23	7 0	5 25	5 4
26	T	First settlement Australia, 1788		7 21	5 5	6 10	7 17	5 9	6 6	6 59	5 26	5 48
27	F	Strikes in Great Britain, 1919		7 20	5 6	6 49	7 16	5 10	6 45	6 59	5 27	6 30
28	S	Wyoming ratifies suffrage, 1920		7 19	5 7	sets	7 15	5 11	sets	6 58	5 28	sets
29	S	Fourth Sunday after Epiphany		7 18	5 8	7 3	7 14	5 13	7 5	6 58	5 29	7 13
30	M	Gov. Goebel, Ky., shot, 1900		7 17	5 10	8 1	7 13	5 14	8 3	6 57	5 30	8 7
31	T	Jaures, Mex., seized, 1912		7 16	5 12	9 1	7 12	5 15	9 1	6 57	5 31	9 1

Gestation Table

Jan.	Mare	Cow	Sow	Ewe
1	Nov29	Oct 10	Apr22	May22
2	30	11	23	31
3	Dec 1	12	24	June1
4	2	13	25	2
5	3	14	26	3
6	4	15	27	4
7	5	16	28	5
8	6	17	29	6
9	7	18	30	7
10	8	19	May 1	8
11	9	20	2	9
12	10	21	3	10
13	11	22	4	11
14	12	23	5	12
15	13	24	6	13
16	14	25	7	14
17	15	26	8	15
18	16	27	9	16
19	17	28	10	17
20	18	29	11	18
21	19	30	12	19
22	20	31	13	20
23	21	Nov 1	14	21
24	22	2	15	22
25	23	3	16	23
26	24	4	17	24
27	25	5	18	25
28	26	6	19	26
29	27	7	20	27
30	28	8	21	28
31	29	9	22	29

February

1st to 10th—Rain storms over South Atlantic and Gulf States. Mild and pleasant conditions on Pacific slope and states of the Middle West. Snow in states of the Northwest.

11th to 19th—Sleet and rain over Southern States and general snows over states of the northwest, the Lake region and New England. Unsettled and threatening weather from Texas eastward to the Carolinas and Virginias.

20th to 28th—Very stormy weather general. Sleet and snow over Middle Atlantic and New England States. Damp and disagreeable in Southern States. Very cold in Northwest.

The temperature will be below normal except in Gulf and South Atlantic States, where it will be slightly above normal. The precipitation will be light over section extending eastward from California to Texas and Arkansas. Elsewhere it will be at or near normal.

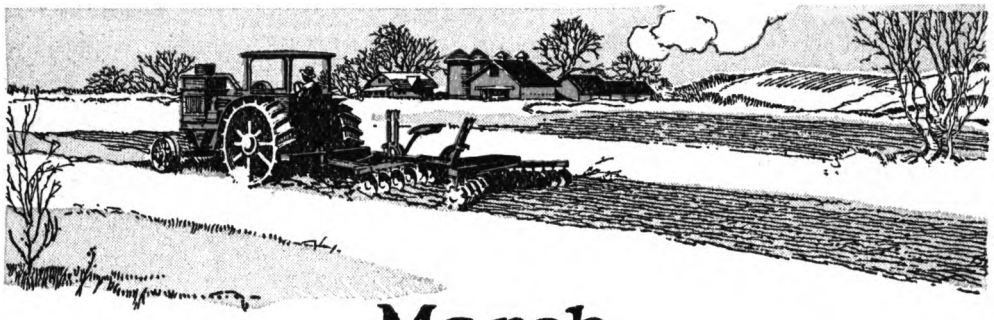
Moon's Phases — **Eastern Time**

	D.	H.	M.	
First Quarter	4	11	52	A.
Full Moon	11	8	17	A.
Last Quarter	18	1	18	A.
New Moon	26	1	48	A.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES			Latitude of MIDDLE STATES			Latitude of SOUTHERN STATES		
				Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.
1	W	Roentgen Rays discovered, 1896		7 15	5 13	9 55	7 11	5 16	9 55	6 56	5 32	9 52
2	T	Candlemas		7 14	5 14	10 55	7 10	5 18	10 53	6 55	5 33	10 46
3	F	Greece declared free, 1830		7 13	5 15	11 55	7 10	5 19	11 52	6 55	5 34	11 42
4	S	Utah admitted, 1896		7 12	5 17	morn	7 9	5 20	morn	6 54	5 35	morn
5	S	Fifth Sunday after Epiphany		7 11	5 18	0 55	7 8	5 21	0 52	6 53	5 36	0 38
6	M	Va. Senate rejects suffrage, 1920		7 10	5 19	1 56	7 7	5 22	1 52	6 52	5 37	1 35
7	T	Baltimore fire, 1904		7 9	5 20	2 57	7 6	5 24	2 53	6 52	5 38	2 34
8	W	Japan enters War, 1904		7 8	5 22	3 55	7 4	5 25	3 51	6 51	5 38	3 31
9	T	N. J. ratifies suffrage, 1920		7 7	5 24	4 50	7 3	5 26	4 46	6 50	5 39	4 27
10	F	D.W.Witte, died, 1920		7 6	5 25	5 41	7 2	5 28	5 37	6 49	5 40	5 20
11	S	William and Mary crwnd., 1689		7 4	5 26	rises	7 1	5 29	rises	6 49	5 41	rises
12	S	Septuagesima Sunday		7 2	5 27	6 37	7 0	5 30	6 39	6 48	5 42	6 46
13	M	Arizona ratifies suffrage, 1920		7 1	5 28	7 54	6 58	5 31	7 55	6 47	5 43	7 56
14	T	St. Valentine's Day		7 0	5 30	9 5	6 57	5 32	9 4	6 46	5 44	9 0
15	W	Terrorists seized in N. J., 1920		6 59	5 31	10 18	6 56	5 33	10 16	6 45	5 45	10 8
16	T	Adelia Belle Beard died, 1920		6 58	5 32	11 29	6 54	5 35	11 25	6 44	5 46	11 14
17	F	Columbia burned, 1865		6 56	5 33	morn	6 53	5 36	morn	6 43	5 46	morn
18	S	Vermont admitted, 1791		6 55	5 35	0 35	6 52	5 37	0 31	6 42	5 47	0 16
19	S	Sexagesima Sunday		6 53	5 36	1 37	6 51	5 38	1 33	6 41	5 48	1 15
20	M	Gen. Beauregard died, 1893		6 52	5 37	2 34	6 49	5 40	2 29	6 40	5 49	2 10
21	T	Spanish ministry resigns, 1920		6 50	5 38	3 26	6 48	5 41	3 20	6 39	5 50	3 1
22	W	George Washington born, 1732		6 49	5 39	4 10	6 46	5 42	4 6	6 38	5 51	3 47
23	T	Pershing visits Richmond, 1920		6 47	5 41	4 50	6 45	5 43	4 46	6 37	5 51	4 29
24	F	St. Mathias		6 46	5 42	5 25	6 43	5 45	5 22	6 35	5 52	5 7
25	S	Mrs. Nation bailed and rel., '08		6 44	5 43	5 56	6 42	5 46	5 53	6 34	5 53	5 43
26	S	Quinquagesima Sunday		6 43	5 45	sets	6 40	5 47	sets	6 33	5 54	sets
27	M	Railroad strike in France, 1920		6 42	5 46	6 51	6 39	5 48	6 53	6 32	5 54	6 55
28	T	Shrove Tuesday		6 40	5 48	7 48	6 37	5 49	7 47	6 30	5 55	7 46

Gestation Table

Feb.	Mare	Cow	Sow	Ewe
1	Dec30	Nov10	May23	June30
2	31	11	24	July 1
3	Jan 1	12	25	2
4	2	13	26	3
5	3	14	27	4
6	4	15	28	5
7	5	16	29	6
8	6	17	30	7
9	7	18	31	8
10	8	19	June1	9
11	9	20	2	10
12	10	21	3	11
13	11	22	4	12
14	12	23	5	13
15	13	24	6	14
16	14	25	7	15
17	15	26	8	16
18	16	27	9	17
19	17	28	10	18
20	18	29	11	19
21	19	30	12	20
22	20	Dec 1	13	21
23	21	2	14	22
24	22	3	15	23
25	23	4	16	24
26	24	5	17	25
27	25	6	18	26
28	26	7	19	27



March

1st to 10th—Cold wave. Freezing temperature as far south as northern Texas, Arkansas, Tennessee and the Carolinas. Unsettled and disagreeable conditions over Middle Atlantic and New England States. Fair and frosty in states of the Northwest.

11th to 20th—Fair, pleasant weather at most points west of the Mississippi river. Cloudy over Gulf and South Atlantic States.

21st to 31st—Rising temperature over most sections. Damp and foggy over Gulf coast. Snow over states of the Rocky Mountain region.

The temperature will be slightly above the usual March normal. The precipitation will be at or near normal at all points except over Southern and Middle Atlantic States, where it will be above the average.

Moon's Phases — Eastern Time

	D.	H.	M.	
First Quarter	6	2	22	A.
Full Moon	13	6	14	M.
Last Quarter	20	3	43	M.
New Moon	28	3	3	M.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES			Latitude of MIDDLE STATES			Latitude of SOUTHERN STATES		
				Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.
1	W	Ash Wednesday	♒	6 38	5 49	8 48	6 36	5 50	8 47	6 30	5 56	8 41
2	T	Prem. Gladstone resigns, 1894		6 36	5 50	9 47	6 35	5 51	9 45	6 29	5 57	9 36
3	F	Mary Pickford divorce, 1920	♓	6 35	5 51	10 48	6 33	5 52	10 45	6 27	5 58	10 32
4	S	McKinley's second inaug., 1901		6 33	5 52	11 46	6 31	5 53	11 43	6 26	5 59	11 27
5	S	Quadragesima Sunday		6 32	5 53	morn	6 30	5 54	morn	6 25	6 0	morn
6	M	Chicago express strike, 1920		6 30	5 54	0 45	6 28	5 55	0 41	6 23	6 0	0 23
7	T	Prem. Rouvier resigned, 1906		6 28	5 56	1 43	6 27	5 57	1 38	6 22	6 1	1 19
8	W	Ember Day	♈	6 27	5 57	2 39	6 25	5 58	2 34	6 21	6 2	2 14
9	T	Peace Cab. in Greece, 1915		6 25	5 58	3 28	6 24	5 59	3 24	6 20	6 3	3 6
10	F	Ember Day		6 23	5 59	4 14	6 22	6 0	4 11	6 18	6 4	3 56
11	S	Ember Day	♉	6 21	6 0	4 57	6 21	6 1	4 54	6 17	6 4	4 44
12	S	Second Sunday in Lent		6 19	6 1	5 36	6 19	6 2	5 34	6 16	6 5	5 27
13	M	Emp. of Russia assassintd., '80		6 18	6 3	rises	6 17	6 3	rises	6 15	6 6	rises
14	T	Justice E. A. Philbin died, 1920	♊	6 16	6 4	7 53	6 15	6 4	7 51	6 13	6 7	7 45
15	W	Maine admitted, 1820		6 15	6 5	9 7	6 14	6 5	9 4	6 12	6 7	8 55
16	T	General strike in Berlin, 1920		6 13	6 6	10 20	6 12	6 6	10 16	6 11	6 8	10 1
17	F	St. Patrick's Day	♋	6 11	6 7	11 25	6 11	6 7	11 21	6 10	6 9	11 4
18	S	Disorders in Egypt, 1919		6 9	6 9	morn	6 9	6 8	morn	6 8	6 9	morn
19	S	Third Sunday in Lent		6 8	6 10	0 25	6 8	6 10	0 21	6 7	6 10	0 2
20	M	"The Maryland" launched, '20		6 6	6 11	1 20	6 6	6 11	1 15	6 6	6 11	0 56
21	T	Spring begins	♌	6 4	6 12	2 7	6 4	6 12	2 3	6 4	6 12	1 44
22	W	Przemysl sur. to Russia, 1915		6 2	6 13	2 49	6 2	6 13	2 45	6 3	6 12	2 28
23	T	Sir. Edw. Woodgate died, 1900		6 1	6 14	3 26	6 1	6 14	3 22	6 2	6 13	3 7
24	F	Samuel Parker died, 1920	♍	5 59	6 15	3 59	5 59	6 15	3 55	6 0	6 14	3 44
25	S	Gen'l strike in Naples, 1920		5 57	6 16	4 29	5 58	6 16	4 25	5 59	6 14	4 17
26	S	Fourth Sunday in Lent		5 55	6 18	4 56	5 56	6 17	4 54	5 58	6 15	4 49
27	M	Strike in Naples ends, 1920		5 54	6 19	5 22	5 54	6 18	5 21	5 56	6 15	5 20
28	T	General storm over country, '20	♎	5 52	6 20	sets	5 52	6 19	sets	5 55	6 16	sets
29	W	C. S. Kane died, 1915		5 50	6 21	7 41	5 51	6 20	7 39	5 54	6 17	7 31
30	T	Suffrage beaten in Miss., 1920		5 48	6 22	8 41	5 49	6 21	8 38	5 52	6 17	8 27
31	F	Calhoun died, 1850	♏	5 47	6 23	9 41	5 48	6 22	9 38	5 51	6 18	9 23

Gestation Table

Mar.	Mare	Cow	Sow	Ewe
1	Jan 27	Dec 8	June 20	July 22
2	28	9	21	29
3	29	10	22	30
4	30	11	23	31
5	31	12	24	Aug 1
6	Feb 1	13	25	2
7	2	14	26	3
8	3	15	27	4
9	4	16	28	5
10	5	17	29	6
11	6	18	30	7
12	7	19	July 1	8
13	8	20	2	9
14	9	21	3	10
15	10	22	4	11
16	11	23	5	12
17	12	24	6	13
18	13	25	7	14
19	14	26	8	15
20	15	27	9	16
21	16	28	10	17
22	17	29	11	18
23	18	30	12	19
24	19	31	13	20
25	20	Jan 1	14	21
26	21	2	15	22
27	22	3	16	23
28	23	4	17	24
29	24	5	18	25
30	25	6	19	26
31	26	7	20	27

Fertilizing Potatoes

By Andrew J. Patten, Professor of Agricultural Chemistry, Michigan Agricultural College

THE cost of producing a crop depends very largely upon the yield per acre or other unit of land area. There are many factors that operate to influence the yield, of which the following may be mentioned as being perhaps the most important: type of soil; fertility of the soil; preparation of seed bed; cultivation; drainage; climatic conditions. Any or all of these factors, with the exception of climatic condition, may be more or less altered or changed by the farmer to suit a given condition. Concerning the type of soil, it is, of course, impossible to bring about any fundamental change, but the farmer can, by giving attention to other factors, such as drainage, cultivation, etc., very greatly alter the mechanical condition of a soil and he can and should choose his crops from those that are adapted to his own particular soil conditions.

Potato Has Great Adaptability

The potato is an artificial plant which, by adaptation, has been greatly changed from its primeval form. For this reason, there is probably no other crop that, under favorable conditions, will respond better to extensive fertilization. It must, however, be always remembered that in order to obtain the maximum results from the fertilizer applied the other soil factors must be as nearly perfect as it is possible to obtain them. No specific recommendations can be made that will apply over large areas and what follows must be considered as of general applicability to be altered as local conditions may require.

Thrives Best in Loam Soil

The potato does not have an extensive root system and thrives best in a moderately heavy loam or sandy loam soil. It is very essential that the soil be well supplied with organic matter, not only to provide the required chemical condition, but also to increase the water holding capacity. For this reason it is a very general practice with the more successful raisers to plant the crop on a clover sod.

Where potatoes are the main crop it is customary to follow a short rotation, such as oats or rye, clover and potatoes. Even where potatoes are not the main crop but an important one it is usually more satisfactory to have them follow clover.

Formerly the potato fertilizers most generally used contained high percentages of potash. The 3-8-10 and 4-8-10 formulas were quite common brands. Owing to the scarcity of potash during the war the percentage of potash was greatly reduced. The results obtained during this period were, however, not greatly, if at all, lowered, owing to a reduction of the potash supply. In consequence of this experience and the results of carefully planned experiments, both in New Jersey and Maine, a fertilizer carrying 6 percent potash has been quite generally agreed upon.

It was formerly believed that muriate of potash was unsatisfactory for potatoes and that where large quantities of fertilizer were applied the sulphate of potash should be used. This also has been the subject of extensive experimentation, with the result that no difference has been noticed in either yield or quality of potatoes where the two forms of potash were used, even to the extent of 2,500 pounds of 3-8-6 fertilizer per acre.

Amount of Nitrogen Varies

It has been shown, however, that where unusually large amounts of muriate of potash are used the potatoes have a tendency to be watery and rather waxy and gummy. Such a condition would hardly ever occur in actual practice. Muriate of potash is generally somewhat cheaper than the sulphate, and under ordinary conditions would be recommended.

The amount of nitrogen most generally recommended is from 3 to 4 percent. Local conditions should govern the amount of nitrogen used. When planting on a heavy clover or alfalfa sod less nitrogen will be needed but on soils lacking organic matter, a larger amount of nitrogen might be used to advantage, provided the condition as to moisture is satisfactory.

The following fertilizer formulas are recommended as supplying the needs of varying conditions: those carrying from 2 to 4 percent nitrogen, from 8 to 12 percent phosphoric acid, and from 2 to 6 percent potash. The formulas with the higher percentages of phosphoric acid are more particularly adapted to the Middle West where the soils are generally lacking in this plant food.

The amount of fertilizer that may be efficiently used depends very largely upon the condition of the soil, method of planting and other factors. On new land, perhaps 500 pounds per acre would be sufficient, but as the land is used and the depth of the surface soil and the humus content are gradually increased, the amount of fertilizer should be increased, so long as it yields profitable returns. The maximum amount may range from 1,500 to 2,500 pounds per acre, depending upon local conditions.

It is quite generally true that greater re-

Continued on page 25

The Drudgery of Yesterday's Kitchen—

Marketing Farm Produce

By Frank App, Secretary New Jersey Federation of County Boards of Agriculture

GREAT industries have been built on the production of a standard product. This standardization of production and manufacturing has contributed largely to the development of the commercial and manufacturing industry. Farm produce can not be standardized so rapidly as manufactured products but the farmer can grade his farm produce and in that way greatly facilitate his marketing.

The first duty of the farmer is to standardize his methods of production. A factory that is successfully operated makes products of good quality, after which little difficulty is encountered in distribution. Likewise, the farmer must grow successful crops. He must produce quality as well as quantity, and must so standardize his methods of production that he can count pretty definitely on what his crops are to be; not merely how much the acre yield will be but how excellent the quality.

To do this, he must successfully rotate his crops, break the lands, cultivate and liberally fertilize. He must find the needs of each crop as well as the deficiencies in his soils and plan to meet all these conditions, after which he may count on successful crops. It has recently been found by experiment at the Iowa Experiment Station that when crops are properly fertilized the quality is improved and the low grade products reduced to a minimum.

He must observe certain standardized suggestions regarding the placing of his products on the market. The bundling or boxing is one of the first things to consider. He must study what effect an attractive package has on the buying public. After he has gone this far along, he will begin to realize the many advantages of grading the harvested crop.

Grading Fixes Standards

The advantages of grading farm products for the market are many.

1. **It fixes a standard for the market.** By grading, standard farm products are obtained which allow the advantages which standardized articles command in the market.

2. **It serves to better advertise the product.** A standard grade can be branded and advertised so that it may become widely known to the public. This creates a demand that can not be obtained in any other manner.

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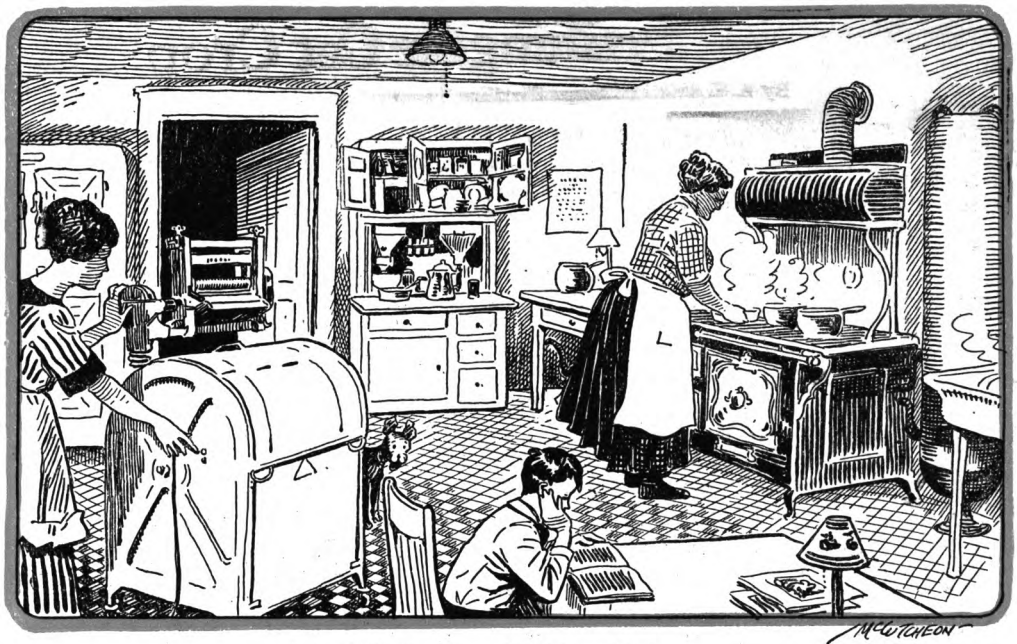

Is Driven Away by Science Today

Marketing Farm Produce

Continued from preceding page

3. **It places a premium on better grades.** When products are properly graded, the producer who has the highest quality obtains a premium over the producer who has a mediocre quality of product. In this way, each individual receives nearer the true value of his product. When a product is placed on the market indiscriminately, the man who has a high quality product does not receive the benefit of quality, whereas the man who has a product a little below the average receives proportionately more than that to which he is entitled. Grading not only makes a distinction of quality, but it tends to improve production.

Sales Policy Is Valuable

4. **It assists in a sales policy.** In large organizations a sales policy must be adopted which will allow them to advertise and brand products which they are marketing. Unless it is possible to grade and standardize the products it is very difficult to have a sales policy which would be satisfactory.

5. **Decreases the cost of marketing.** With the proper grading, the cost of marketing decreases because the poorer products are not shipped to market. The portion which has small value due to poor quality is usually kept at home on the farm. When it is shipped the distributor frequently needs to dispose of it for a very low price and occasionally at an entire loss. It does not pay for handling. It also has the advantage of removing the lower grades from the market during the period of the glut.

6. **Facilitates the sale and purchase of farm produce.** Farm products could best be sold when grades are established. This does away with inspecting every purchase as a product is standardized before it leaves the producer. The purchaser knows what he can afford to pay for every grade and in that way does not need to employ an inspector to report to him before he can offer a price. It not only allows cheaper distribution because of this but quicker distribution. This allows the quotation and publication of spot and future prices.

7. **Facilitates storing and handling.** When the products are properly graded they can be stored and handled with much greater ease than when they are ungraded. It furthermore allows cheaper storing and handling in as much as low quality products are not likely to be stored. When stored in grades it will allow the general warrant or negotiable warehouse receipt, so that the grower can withdraw his portion of the product any time he wishes without confusion or embarrassment in the warehouse work. This system does away with receipts for any specific lots as all the grades of one kind can be put together and the grower can any time get his quantity from that grade, although he will not always get the same which he put into the warehouse.

Continued on next page

Fertilizing the Oat Crop

By A. G. McCall, in Charge of Fertilizer Investigations, Maryland Experiment Station

IN MANY sections of the country oats are grown with less profit than any of the other important cereal crops, partly because of the exacting climatic requirements of the oat plant and partly because of the fact that the crop seldom receives any direct applications of manures or fertilizers. Practical experience, as well as evidence from our agricultural experiment stations, has shown that oats respond readily to the judicious use of fertilizers and manures applied directly to the crop. Under certain conditions it may be more profitable to apply the manure and fertilizers to some of the other crops in the rotation, leaving the oats to feed on the residue left in the soil by the preceding crop. In certain sections where the soil is fertile and oats follow a heavily fertilized crop such as sugar beets or potatoes no further application of fertilizer, direct to the oat crop, is necessary.

Fall-sown Oats Need Nitrogen

In the South where oats are seeded in the fall, nitrogen is usually the limiting element and must be supplied in some form if a good yield is to be secured. In this section stable manure is not available in sufficient quantities to supply the necessary amount of nitrogen, therefore, dependence must be placed upon green manures and commercial fertilizers. The best oat yields are usually secured directly after cowpeas, soybeans or velvet beans, but other legumes may be used effectively as green manuring crops. Under average conditions, as above described, increased yields will be secured from the use of light applications of a complete fertilizer at the time the oats are seeded. The amount of fertilizer that can be used with profit will vary from 100 pounds per acre on fertile clays to as much as 250 pounds on some of the poor sandy soils.

Needs of Various Soils

If nitrogen has been supplied in liberal quantities through the use of legumes as green manure, it need not be supplied in a commercial form. In this case an acid phosphate and potash formula may be used in preference to the complete fertilizer. If, however, the oats are not grown immediately after the green-manuring crop, or if the preceding crop was light, a mixture containing available nitrogen in addition to phosphoric acid and potash should be used. For some soils the best results are obtained by applying the nitrogen in the spring as a top dressing. Poor sandy soils should have an application of fertilizer sufficient to furnish about 25 pounds of nitrogen per acre. For heavier soils of the clay type this application may be reduced about one-fourth.

The Maryland Experiment Station (Bulletin 200, p. 119) makes the following recommendations concerning the use of fertilizers for fall-sown oats.

For soils producing 50 to 60 bushels of corn in a good season and on which clover is grown regularly in the rotation, or where cowpeas or soybeans are plowed under, nitrogen is not necessary. Under such conditions, on medium heavy loam soils, 200 to 300 pounds of acid phosphate is all that is required. If, however, the soil is inclined to be sandy, a small percentage of potash added to the formula may give profitable returns. Soils not producing over 50 bushels of corn per acre should be fertilized at the rate of 250 to 300 pounds per acre with a fertilizer containing 2% of ammonia, 10%

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Marketing Farm Produce

Continued from page 13

8. **Facilitates making of loans on farm products.** Graded products have standard values which can be used for obtaining loans so that they may be held until the market warrants their sale.

9. **Protects buyers and sellers from unscrupulous practices.** When buyer or seller buys or sells he has a standard which he must live up to. In this way, it does away with unscrupulous practices which have been so common in the marketing of some of our ungraded farm products.

10. **Allows trading in futures.** Futures are bought and sold on grades as the dealers must know some definite standard which they are buying or selling when they are dealing in futures.

11. **Assists in selling product.** The buyer of farm products frequently purchases by eye and a graded article properly packed will present a much more attractive appearance than an ungraded product. This will facilitate the sale very materially.

12. **Helps establish a world market for agricultural staples.** Our local markets are in turn dominated by the world market. It is only by raising a standard product that we are able to have the rural market which reflects down through to the local market.

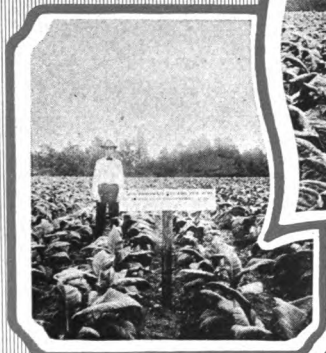
OATS—Complete Fertilizer applied on plot to left. 13 years average yield, 49 bushels per acre. Plot to right received no treatment. Average yield 33.9 bushels per acre.

Roadside market of John S. Ayer, Yarmouth, Maine All vegetables and fruit grown by Mr. Ayer on his farm exclusively with Armour's BIG CROP Fertilizer. No barnyard manure used.

GREEN MOUNTAIN POTATOES—grown by John S. Ayer, Yarmouth, Maine. 2000 lbs. Armour's BIG CROP 2-10-6 Fertilizer used per acre. At the date this picture was taken yield was estimated at 400 bushels per acre, all of which will be sold in Mr. Ayer's Roadside Market.

Virginia Tobacco fertilized with Complete Fertilizer. Nitrogen. Available Phosphoric Acid and Potash.

Virginia Tobacco fertilized with Available Phosphoric Acid and Potash



Virginia Tobacco fertilized with Acid Phosphate only.

Maryland Tobacco fertilized at the left with Complete Fertilizer containing Nitrogen, and at the right with an Available Phosphoric Acid and Potash Mixture, showing the value of Nitrogen.

Wisconsin Tobacco fertilized at the left with available plant food in Complete Fertilizer and at the right with Barnyard Manure.

A single Tobacco leaf grown with Armour's BIG CROP Tobacco Fertilizer.

Lessening Tobacco Production Cost

By James Johnson, Associate Professor of Horticulture, University of Wisconsin

THE fertilization of the tobacco crop requires, on the whole, more science and judgment than that of any other crop grown. This is not only because of the fact that it is as essential to produce satisfactory quality as it is to produce good yields, but also for the reason that we have in the United States several different types grown for different purposes and consequently varying in the treatment required for best results. These tobaccos are also grown in widely different sections of the country on markedly different soils, so that it is evident that the fertilizer formula, the amounts to be applied, and in some instances the form of the fertilizer may differ very widely for the different sections.

Determining Tobacco Requirements

Fundamentally, the fertilizer requirement of any soil is largely determined by its natural fertility and its acquired or lost fertility as a result of previous treatment. From a technical standpoint, however, the fertilizer requirements of tobacco have also been determined by three methods: 1, chemical analysis of the soil; 2, chemical analysis of the plant; 3, fertilizer plot experiments.

While the former two methods are useful, they are not always reliable and it is generally agreed that the third method, that is, broadly speaking, field trials, is the most sound method for determining the fertilizer requirement of a soil. While the average farmer can not conduct a detailed fertilizer test on his soil, he can determine whether the fertilizers recommended by state or government agents or fertilizer salesmen will or will not yield profitable returns on his soil.

Lowering Production Cost

To lower cost of production, the tobacco grower must figure not only what it costs him to grow an acre of tobacco, but also what it costs him to grow a pound of tobacco. Every tobacco grower owes it to his soil, to his crop and to himself to give commercial fertilizers a fair trial under his conditions. This is especially true of the tobacco-growing districts in which commercial fertilizers are not yet extensively used, where tobacco is grown on naturally fertile soils, and where animal manures are used as fertilizers but do not give the proper balance of plant foods, from the standpoint of the tobacco crop itself, or from that of agriculture in relation to permanent soil fertility.

We have, on the other hand, a class of tobacco soils naturally low in fertility, and where the whole crop is practically grown on the fertilizer applied yearly. These soils, because of their physical nature, are especially adapted for the types of tobacco grown, and will produce the proper quality, provided the proper plant foods are applied to the soil in approximately the correct proportion, and the weather and other conditions do not seriously interfere. These soils are principally those of the Connecticut Valley and the Georgia-Florida section, where the highest-priced cigar wrapper tobacco is grown, the great flue-cured section of Virginia and North and South Carolina and Georgia, to some extent the "dark-tobacco" sections of Virginia, Kentucky and Tennessee, and the Maryland tobacco section.

In these tobacco districts, commercial fertilizers have been in general use for a long period and while the fertilizer formulas used in any one section differ somewhat from those used in another section, which is to be expected on account of the individual variations in the soils, yet they are, on the whole, quite similar.

Influence of Fertilizers on Crops

Before summarizing the fertilizer applications found to be most desirable for the various tobacco sections, it is well to consider first the influence of the form of the fertilizer used on the tobacco crop. The three principal fertilizing elements (nitrogen, phosphorus and potash) are all obtainable in inorganic or mineral form, in which condition they are most readily soluble in water and hence most rapidly available to the plants. It has been found, however, that it is well to use formulas made up of part inorganic and part organic fertilizers, especially in sandy soils or soils low in vegetable matter and humus. Consequently, in such soils some "organic" fertilizers (or fertilizer products made from animal or vegetable matter) are preferred. Such fertilizers as cotton-seed meal, dried blood, bone meal and tankage are therefore much used. Nitrate of soda and sulphate of ammonia, the best sources of rapidly available nitrogen or ammonia, may be used in moderate amount (100 to 200 pounds per acre) in conjunction with other fertilizers as a "starter."

Care Must Be Used

Sulphate of potash is used as a source of potash for tobacco when obtainable. Muriate of potash should not be used on account of the chlorine it contains, which will prove injurious to the burning quality of tobacco. Except for the chlorine the muriate would

Continued on page 31

April

1st to 10th—Damp and unsettled conditions on Pacific slope and in Montana and the Dakotas. Gales over Great Lakes. Clear fair days and cold frosty nights over northern sections. Mild weather over eastern sections.

11th to 20th—Sleet and snow over states of the Northwest and Middle West. Warm weather in southern and eastern sections. Unsettled in northeastern sections of the country.

21st to 30th—Thunder showers in southwest and middle west sections. Heavy fog over Lake region and New England. Cloudy and foggy in eastern sections.

The temperature will range above the average. The rainfall will be deficient in northern and eastern sections, but near normal over states of the South and Southwest.

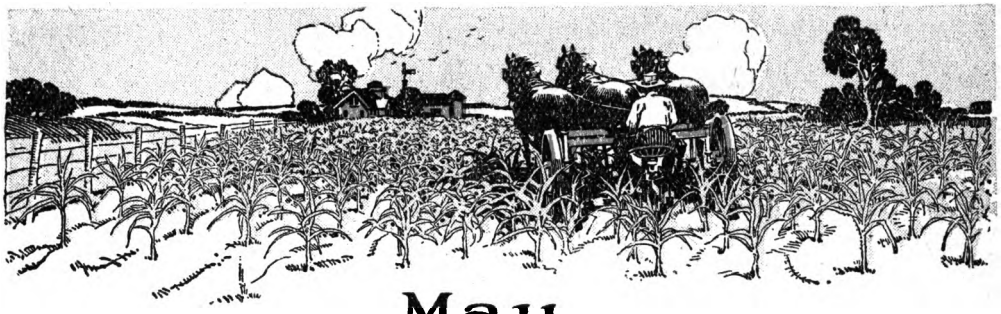
Moon's Phases — Eastern Time

	D.	H.	M.	
First Quarter	5	0	46	M.
Full Moon	11	3	44	A.
Last Quarter	18	7	54	A.
New Moon	27	0	4	M.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of MIDDLE STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of SOUTHERN STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.
1	S	All Fool's Day	♈	5 45	6 24	10 40	5 46	6 23	10 36	5 49	6 19	10 19
2	S	Fifth Sunday in Lent	♈	5 43	6 25	11 38	5 44	6 24	11 33	5 48	6 20	11 14
3	M	Toledo Trolley strike, 1920	♈	5 41	6 26	morn	5 43	6 25	morn	5 47	6 21	morn
4	T	P. D. Tyrrell died, 1920	♉	5 40	6 27	0 33	5 41	6 26	0 28	5 45	6 21	0 9
5	W	Railroad strike in Chicago, 1920	♉	5 38	6 29	1 23	5 39	6 27	1 18	5 43	6 22	1 0
6	T	Mormon temple dedicated, 1893	♉	5 36	6 30	2 9	5 38	6 28	2 5	5 42	6 23	1 49
7	F	Turksdestroy Amer. Orphg., '20	♊	5 34	6 31	2 52	5 36	6 29	2 49	5 41	6 23	2 36
8	S	F.W. Woolworth died, 1919	♊	5 33	6 32	3 29	5 35	6 31	3 27	5 40	6 24	3 19
9	S	Palm Sunday	♊	5 31	6 33	4 5	5 33	6 32	4 3	5 39	6 25	3 59
10	M	Robt. Spice educator, died 1920	♋	5 30	6 34	4 43	5 31	6 33	4 43	5 38	6 26	4 43
11	T	Strike halts N.Y traffic, 1920	♋	5 28	6 36	rises	5 29	6 34	rises	5 37	6 26	rises
12	W	Fort Sumter fired on, 1861	♋	5 26	6 37	7 55	5 28	6 35	7 51	5 36	6 27	7 40
13	T	Mrs. Phoebe Hearst died, 1919	♌	5 24	6 38	9 4	5 26	6 36	9 0	5 34	6 28	8 45
14	F	Good Friday	♌	5 23	6 39	10 9	5 25	6 37	10 5	5 33	6 28	9 47
15	S	Rail strike leaders arrested, '20	♌	5 21	6 40	11 9	5 23	6 38	11 4	5 32	6 29	10 45
16	S	Easter Sunday	♍	5 20	6 41	morn	5 22	6 39	11 56	5 31	6 30	11 38
17	M	Virginia seceded, 1861	♍	5 18	6 42	0 2	5 20	6 40	morn	5 29	6 30	morn
18	T	Robt. Burns died, 1821	♍	5 16	6 43	0 46	5 19	6 41	0 42	5 28	6 31	0 24
19	W	"Outlaw" railstrike brkn., 1920	♎	5 15	6 44	1 28	5 17	6 42	1 22	5 27	6 32	1 6
20	T	Kisheniv Massacre, 1903	♎	5 13	6 45	2 0	5 16	6 43	1 56	5 26	6 33	1 43
21	F	War with Spain beg., 1898	♎	5 12	6 47	2 31	5 14	6 44	2 28	5 25	6 33	2 18
22	S	Fielding born, 1707	♏	5 10	6 48	2 59	5 13	6 45	2 57	5 24	6 34	2 50
23	S	Low Sunday	♏	5 8	6 49	3 24	5 11	6 46	3 23	5 23	6 35	3 21
24	M	Hines, dir. of R. R., resgns., '20	♏	5 7	6 50	3 52	5 10	6 47	3 53	5 22	6 36	3 54
25	T	St. Mark	♐	5 5	6 51	4 22	5 8	6 48	4 24	5 20	6 36	4 28
26	W	Wilkes Booth shot, 1865	♐	5 4	6 52	4 51	5 7	6 49	4 53	5 19	6 37	5 1
27	T	Gen. U. S. Grant born, 1822	♐	5 2	6 53	sets	5 5	6 50	sets	5 18	6 37	sets
28	F	Rev. Dr. Rother died, 1920	♑	5 1	6 54	8 34	5 4	6 51	8 30	5 17	6 38	8 12
29	S	Mine exp. in Ala., 1912	♑	5 0	6 56	9 32	5 3	6 52	9 28	5 16	6 39	9 9
30	S	Second Sunday after Easter	♑	4 59	6 57	10 30	5 2	6 53	10 24	5 15	6 40	10 5

Gestation Table

Apr.	Mare	Cow	Sow	Ewe
1	Feb 27	Jan 8	July 21	Aug 28
2	28	9	22	29
3	Mar 1	10	23	30
4	2	11	24	31
5	3	12	25	Sept 1
6	4	13	26	1
7	5	14	27	3
8	6	15	28	4
9	7	16	29	5
10	8	17	30	6
11	9	18	31	7
12	10	19	Aug 1	8
13	11	20	2	9
14	12	21	3	10
15	13	22	4	11
16	14	23	5	12
17	15	24	6	13
18	16	25	7	14
19	17	26	8	15
20	18	27	9	16
21	19	28	10	17
22	20	29	11	18
23	21	30	12	19
24	22	31	13	20
25	23	Feb. 1	14	21
26	24	2	15	22
27	25	3	16	23
28	26	4	17	24
29	27	5	18	25
30	28	6	19	26



May

1st to 10th—Mild, soft weather from California eastward to Texas, Oklahoma and Kansas. Thunder showers in Mississippi, Alabama and Georgia. Unsettled over Great Lakes and New England.

11th to 20th—Unsettled over Southwest and Middle West. Warm and pleasant in central and eastern sections. Rising temperature general.

21st to 31st—Lightning, wind and hail in Oklahoma, Kansas, Missouri, Kentucky and Ohio. Abrupt fall in temperature at most points. Rainy condition over Southern States. Dense fogs over Lake region and New England coast.

The temperature will be above the average at most points east of the Mississippi river, but near normal in states of the Southwest and Northwest. The rainfall will be at or near normal.

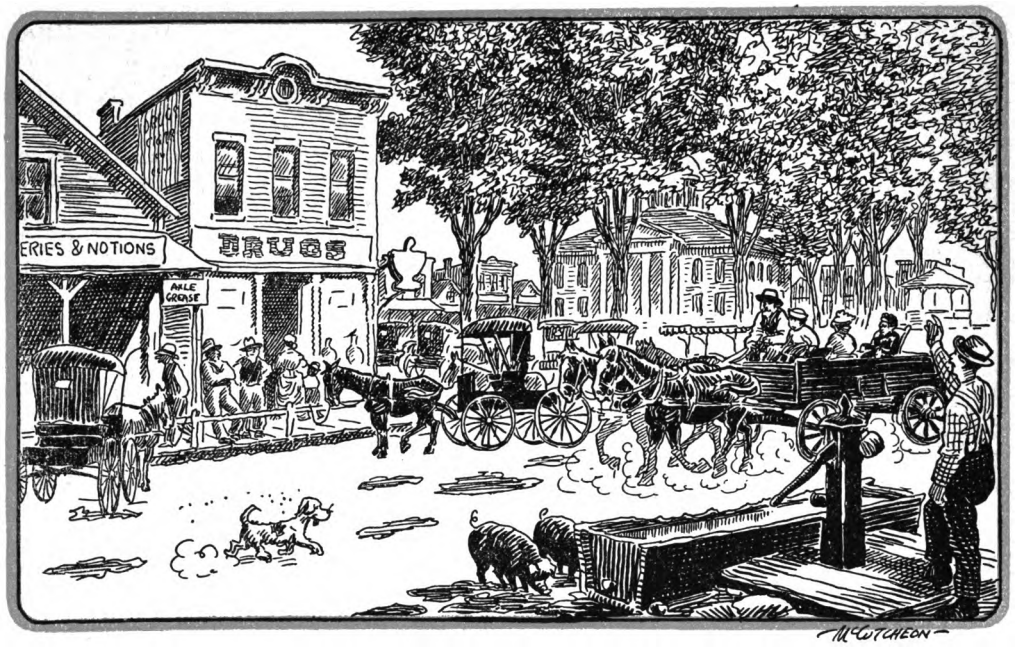
Moon's Phases — **Eastern Time**

	D.	H.	M.	
First Quarter	4	7	56	M.
Full Moon	11	1	6	M.
Last Quarter	18	1	17	A.
New Moon	26	1	4	A.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of MIDDLE STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of SOUTHERN STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.
1	M	St. Philip and St. James	♊	4 57	6 58	11 21	5 0	6 54	11 16	5 14	6 41	10 57
2	T	Tonetti, sculptor, died, 1920		4 56	6 59	morn	4 59	6 55	morn	5 13	6 41	11 48
3	W	French dock work'rs strike,1920		4 54	7 0	0 8	4 58	6 57	0 4	5 12	6 42	morn
4	T	Anarchists riot, Chicago, 1886		4 53	7 1	0 51	4 57	6 58	0 47	5 11	6 43	0 33
5	F	Second Peace Conf., Chgo.,1909		4 51	7 2	1 30	4 55	6 59	1 27	5 10	6 43	1 17
6	S	Battle of Oswego, 1814		4 50	7 3	2 5	4 54	7 0	2 3	5 9	6 44	1 57
7	S	Third Sunday after Easter	♋	4 49	7 4	2 38	4 53	7 1	2 38	5 8	6 45	2 37
8	M	Obregon takes Mex. City, 1920		4 48	7 6	3 16	4 52	7 2	3 18	5 8	6 45	3 20
9	T	Bishop Vincent died, 1920		4 46	7 7	3 50	4 50	7 3	3 52	5 7	6 46	4 0
10	W	British crossZand river, 1900		4 45	7 8	4 26	4 49	7 4	4 30	5 6	6 47	4 40
11	T	Minnesota admitted, 1858		4 44	7 9	rises	4 48	7 5	rises	5 5	6 48	rises
12	F	Boers attack Mafeking, 1900		4 43	7 10	8 54	4 47	7 6	8 49	5 4	6 48	8 29
13	S	Fleet sails for Cuba, 1898		4 42	7 11	9 51	4 46	7 7	9 46	5 3	6 49	9 26
14	S	Fourth Sunday after Easter	♌	4 41	7 12	10 40	4 45	7 8	10 35	5 3	6 50	10 16
15	M	Sen. Clark, Mont., resigns,1900		4 40	7 13	11 22	4 44	7 9	11 18	5 2	6 51	11 1
16	T	Levi P. Morton, N.Y., died,1920		4 39	7 14	11 59	4 43	7 10	11 56	5 1	6 51	11 41
17	W	Pres. of Nicaragua died, 1919		4 38	7 15	morn	4 42	7 11	morn	5 0	6 52	morn
18	T	"The Ohio" launched, 1901		4 37	7 16	0 31	4 41	7 12	0 28	5 0	6 53	0 17
19	F	Spanish fleet at Santiago, 1898		4 36	7 17	1 1	4 40	7 13	0 59	4 59	6 54	0 50
20	S	Cuban Republic inaug., 1902		4 35	7 18	1 27	4 40	7 13	1 26	4 59	6 54	1 22
21	S	Rogation Sunday	♍	4 34	7 19	1 53	4 39	7 14	1 53	4 58	6 55	1 53
22	M	Carranza shot, 1920		4 33	7 20	2 24	4 38	7 15	2 25	4 57	6 56	2 28
23	T	Italy dec.war on Austria, 1915		4 32	7 22	2 51	4 37	7 16	2 53	4 57	6 56	3 0
24	W	Queen Victoria born, 1819		4 31	7 23	3 22	4 36	7 17	3 25	4 56	6 57	3 35
25	T	Ascension Day		4 30	7 24	3 57	4 36	7 18	4 0	4 56	6 58	4 14
26	F	French vote bachelor tax, 1920		4 30	7 25	4 37	4 35	7 19	4 41	4 55	6 58	4 58
27	S	Russian navy def., 1905		4 29	7 26	sets	4 34	7 20	sets	4 55	6 59	sets
28	S	Sunday after Ascension	♎	4 29	7 27	9 18	4 34	7 21	9 13	4 54	7 0	8 54
29	M	Gen. Scott died, 1866		4 28	7 27	10 7	4 33	7 21	10 3	4 54	7 0	9 45
30	T	Fr.& Eng. honor Am. dead,1920		4 27	7 28	10 52	4 32	7 22	10 49	4 54	7 1	10 34
31	W	Johnstown Flood, 1889		4 27	7 29	11 32	4 32	7 23	11 29	4 53	7 1	11 18

Gestation Table

May	Mare	Cow	Sow	Ewe
1	Mar29	Feb 7	Aug20	Sept22
2	30	8	21	28
3	31	9	22	29
4	Apr 1	10	23	30
5	2	11	24	Oct 1
6	3	12	25	2
7	4	13	26	3
8	5	14	27	4
9	6	15	28	5
10	7	16	29	6
11	8	17	30	7
12	9	18	31	8
13	10	19	Sept 1	9
14	11	20	2	10
15	12	21	3	11
16	13	22	4	12
17	14	23	5	13
18	15	24	6	14
19	16	25	7	15
20	17	26	8	16
21	18	27	9	17
22	19	28	10	18
23	20	Mar 1	11	19
24	21	2	12	20
25	22	3	13	21
26	23	4	14	22
27	24	5	15	23
28	25	6	16	24
29	26	7	17	25
30	27	8	18	26
31	28	9	19	27



The Old Hitchin' Post Around the Town Square—

Fertilizing Wheat

Continued from page 7

fields where 2-8-4 or 2-12-4 fertilizer has been used on wheat, good increases in yield have been secured.

On a Miami silt loam or "clay" soil of good quality at LaFayette, the average yield of wheat has been increased 6.4 bushels per acre by an application of 300 pounds of a 2-12-4 fertilizer. At Huntington, under similar conditions, the increase has been 4.3 bushels. At Worthington, on a representative upland "clay" soil of that section of the state, 200 pounds of 2-8-4 fertilizer has increased the yield of wheat 6.9 bushels per acre as the average of seven years. On the experiment field at Bedford, which is representative of the upland soil of south central Indiana, 300 pounds of 2-12-4 fertilizer has increased the yield of wheat 9.3 bushels per acre. On the field at Scottsburg, which represents the hill land of southeastern Indiana, 300 pounds of 2-8-4 fertilizer has increased the yield of wheat 6.6 bushels per acre as the average of the last 15 years. On the field at North Vernon, which represents the flat, whitish silt loam of that region, 200 pounds of 2-8-4 fertilizer has increased the yield of wheat 10.9 bushels per acre as the average of the last seven years.

Calculating the average cost of the fertilizer used on these six fields and the value of the increases in the wheat yields, it will be found that the average profit on the money invested in fertilizer has been around 100 percent. And this has not been all the profit from the fertilizer applied because the yields of clover following the wheat and of corn following the clover have also been considerably increased. These are not unusual results from the use of fertilizer on wheat. Probably more than half of the soils of Indiana would yield similar returns. On the various experiment fields in Ohio, the wheat increases from the use of fertilizer have averaged considerably larger than in Indiana.

In determining the kind and amount of fertilizer to use one should always take into consideration the condition of the particular field and the treatment it has been receiving. On ordinary soils where manure has been used for corn and clover is grown in the rotation and if wheat follows oats or some other summer harvested crop, one may with profit use 200 to 300 pounds per acre of acid phosphate. This will also help the clover which should follow. Where wheat follows corn, it will pay to use 200 to 300 pounds of a high-grade complete fertilizer, something like a 2-12-4 formula. As has been said before, wheat will respond better than most crops to liberal fertilization. The results of the experiments cited above show that it pays. Even on otherwise well treated land the profits have been large.

Is Seen No More in the Live County Seat

Farming as a Business

Continued from page 3

Since the prices of farm products are likely to remain low for several years, it is imperative that farmers reduce the cost of production to the point where maximum profit may be secured. This is a good motto at all times and in all lines of production, but also one that did not receive proper attention during the war.

Cost of Production

The cost of production is more fully under the farmer's control than is the selling price. Cost of production depends on many factors. The selling price depends chiefly on supply and demand. Some of the items that influence cost of production are: labor of men and teams, use of farm equipment, land values and character of soil, intensity of cultivation, size of business, the use of manure and fertilizer, utilization of time and products, amount of waste, weather conditions, weeds, insects, and plant and animal diseases.

Cost Depends on Yield

At any time and place it will cost a definite amount for rent of land, taxes, labor of men and teams, use of equipment and purchase of seeds and fertilizers for an acre of land, whether it produces a full crop or a half crop. Yield should be sufficient to return a maximum profit. This will necessitate the use of the best strains of seeds, the application of the optimum amount of fertilizer and manure and the right amount of labor per unit of land. The cost of producing 60 bushels of corn per acre is usually very little more than that of 30 bushels per acre. Dividing the cost by 60 and 30, respectively, the cost per bushel for the 30-bushel crop is found to be nearly two times that for a 60 bushel crop. The more valuable the crop, the more intensive may be the cultivation applied to it and the larger the expenditure for fertilizer incurred.

Gauging the Value of Intensity

Intensity depends on the type of farming, the character of crop, the value of land, the cost of labor and the price of the product grown. High-priced land demands intensive methods. Crop yields can generally be increased twenty to twenty-five per cent with more than a corresponding increase in profit. It must be remembered, however, that high-priced labor and low-priced products both tend toward extensive methods. For example, intensive methods applied to the production of hay and cereals may be carried out to such a degree as to reduce profits. A farm survey of 135 farms, ranging from 80 to 100 acres each, made a few years ago, gave an average labor income of $421.00 per

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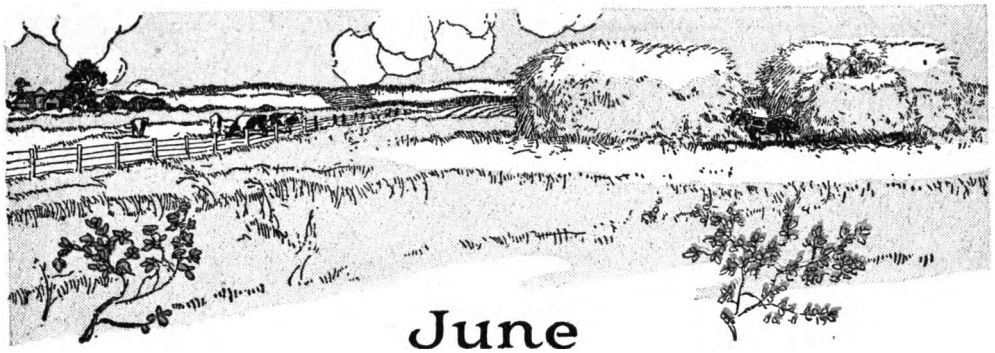


June

1st to 10th—Windy period. High winds and dust storms from California to northern Texas, New Mexico, Colorado and Wyoming. Unsettled with stiff gales over sections adjoining the Great Lakes and North Atlantic coast.

11th to 20th—Heavy rainfall with lightning, wind and hail at most points in Southwestern and Southern States. Showery weather in section extending from the Virginias northward to New York.

21st to 30th—High range of temperature and general sultriness in all states east of the Mississippi river. Very dry and dusty in states of the Pacific slope and Rocky Mountain region. Great discomfort in all large cities owing to the humid conditions of atmosphere.

The temperature will be above normal. The rainfall will be heaviest west of the Mississippi river, deficient elsewhere.

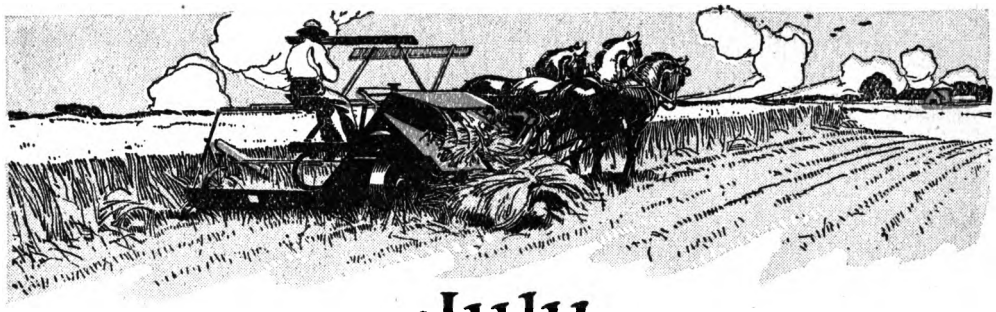
Moon's Phases — Eastern Time

	D.	H.	M.	
First Quarter	2	1	10	A.
Full Moon	9	10	58	M.
Last Quarter	17	7	3	M.
New Moon	24	11	20	A.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES			Latitude of MIDDLE STATES			Latitude of SOUTHERN STATES		
				Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.
1	T	Col.W.Gordon McCabe died,'20	♑	4 26	7 29	morn	4 32	7 24	morn	4 53	7 2	morn
2	F	Irish burn Brit. flag,Wash.,1920	♑	4 26	7 30	0 9	4 31	7 24	0 7	4 53	7 3	0 1
3	S	Battleship Tenn. launched,1920	♒	4 25	7 30	0 42	4 30	7 25	0 41	4 52	7 3	0 37
4	S	Pentecost, Whit Sunday	♒	4 25	7 31	1 16	4 30	7 26	1 17	4 52	7 4	1 18
5	M	U. S. Army drafted, 1917	♒	4 24	7 32	1 50	4 30	7 27	1 53	4 52	7 4	1 58
6	T	Patrick Henry died, 1799	♓	4 24	7 33	2 25	4 29	7 27	2 28	4 52	7 5	2 37
7	W	Ember Day	♓	4 24	7 33	3 0	4 29	7 28	3 4	4 52	7 5	3 18
8	T	Pres. Jackson died, 1845	♓	4 23	7 34	3 44	4 29	7 28	3 48	4 51	7 6	4 5
9	F	Ember Day	♈	4 23	7 35	rises	4 29	7 29	rises	4 51	7 6	rises
10	S	Ember Day	♈	4 23	7 35	8 31	4 28	7 30	8 26	4 51	7 7	8 7
11	S	Trinity Sunday	♈	4 22	7 36	9 17	4 28	7 30	9 13	4 51	7 7	8 55
12	M	New York incorporated, 1665	♈	4 22	7 36	9 58	4 28	7 31	9 54	4 51	7 8	9 38
13	T	Battle of Ghent, 1794	♉	4 22	7 37	10 32	4 28	7 31	10 29	4 51	7 8	10 16
14	W	Dr.W.W. Page died, 1920	♉	4 22	7 37	11 3	4 28	7 32	11 0	4 51	7 8	10 51
15	T	Corpus Christi	♉	4 22	7 38	11 31	4 28	7 32	11 28	4 51	7 9	11 23
16	F	Great Eclipse of 1806	♊	4 22	7 38	11 57	4 28	7 32	11 55	4 51	7 9	11 53
17	S	New Italian Cabinet, 1920	♊	4 22	7 38	morn	4 28	7 33	morn	4 51	7 9	morn
18	S	First Sunday after Trinity	♊	4 22	7 39	0 26	4 28	7 33	0 27	4 51	7 10	0 28
19	M	War of 1812 declared	♋	4 22	7 39	0 53	4 28	7 33	0 54	4 51	7 10	1 0
20	T	Chicago Race Riot, 1920	♋	4 23	7 39	1 22	4 28	7 34	1 25	4 52	7 10	1 33
21	W	Sarah Brown, author, died,1920	♋	4 23	7 40	1 54	4 28	7 34	1 57	4 52	7 11	2 10
22	T	Summer begins	♌	4 23	7 40	2 31	4 29	7 34	2 35	4 52	7 11	2 50
23	F	Ship Victoria sunk, 1893	♌	4 23	7 40	3 14	4 29	7 34	3 18	4 52	7 11	3 37
24	S	St. John The Baptist	♌	4 23	7 40	4 3	4 29	7 35	4 8	4 52	7 11	4 28
25	S	Second Sunday after Trinity	♍	4 24	7 40	sets	4 29	7 35	sets	4 53	7 11	sets
26	M	Rev. Dr.W. H. Roberts d., 1920	♍	4 24	7 40	8 50	4 30	7 35	8 46	4 53	7 11	8 29
27	T	Mormon Smith shot, 1844	♎	4 24	7 40	9 33	4 30	7 35	9 30	4 53	7 11	9 16
28	W	Dem. Nat'l Convention, 1920	♎	4 25	7 40	10 11	4 30	7 35	10 8	4 54	7 12	9 59
29	T	St. Peter and St. Paul	♎	4 25	7 40	10 45	4 31	7 35	10 44	4 54	7 12	10 40
30	F	Guiteau hanged, 1822	♏	4 25	7 40	11 18	4 31	7 35	11 18	4 54	7 12	11 18

Gestation Table

June	Mare	Cow	Sow	Ewe
1	Apr 29	Mar 10	Sept 22	Oct 28
2	30	11	21	29
3	May 1	12	22	30
4	2	13	23	31
5	3	14	24	Nov 1
6	4	15	25	2
7	5	16	26	3
8	6	17	27	4
9	7	18	28	5
10	8	19	29	6
11	9	20	30	7
12	10	21	Oct 1	8
13	11	22	2	9
14	12	23	3	10
15	13	24	4	11
16	14	25	5	12
17	15	26	6	13
18	16	27	7	14
19	17	28	8	15
20	18	29	9	16
21	19	30	10	17
22	20	31	11	18
23	21	Apr 1	12	19
24	22	2	13	20
25	23	3	14	21
26	24	4	15	22
27	25	5	16	23
28	26	6	17	24
29	27	7	18	25
30	28	8	19	26



July

1st to 10th—Cool, damp weather in central and eastern sections. Foggy over Great Lakes and North Atlantic coast. Showery and cool in western sections.

11th to 20th—Heavy rains in Ohio, Pennsylvania and New York. Cloudy and threatening from southern California eastward to New Mexico. Dry and hot in southeastern sections.

21st to 31st—Showery conditions in Southwest. Great heat at points in Missouri, Arkansas, Tennessee, Kentucky, the Virginias and Maryland. Backward weather in Northwest, the Lake region and New England.

The temperature will be generally above the average. The rainfall will be especially heavy in Iowa, the Dakotas and Minnesota. Elsewhere it will be below normal.

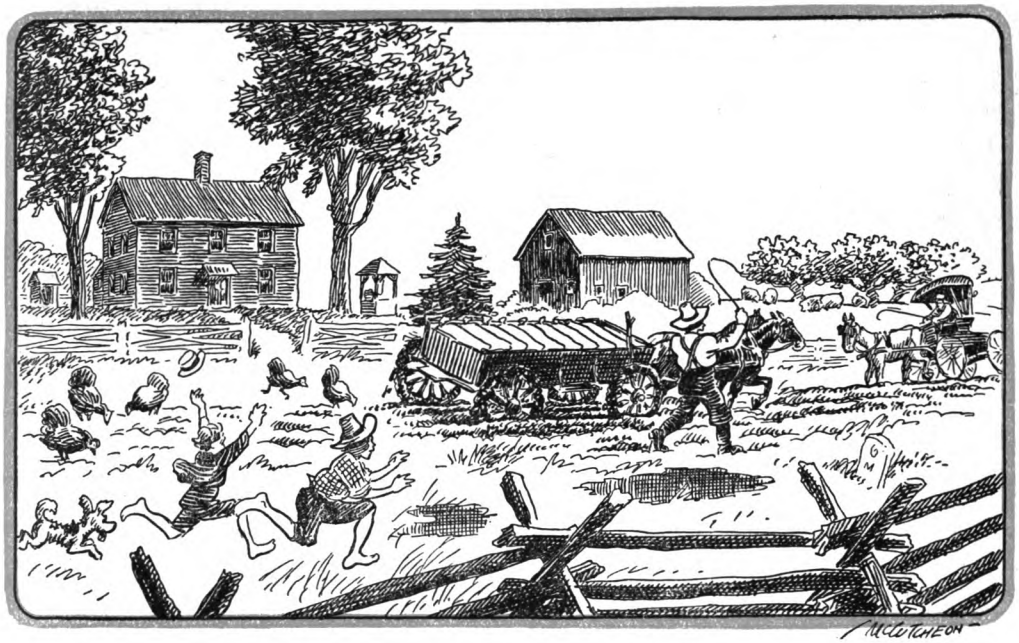
Moon's Phases — Eastern Time

	D.	H.	M.	
First Quarter	1	5	52	A.
Full Moon	8	18	7	A.
Last Quarter	17	0	11	M.
New Moon	24	7	47	M.
First Quarter	30	11	22	A.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES			Latitude of MIDDLE STATES			Latitude of SOUTHERN STATES		
				Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun set H.M.	Moon sr.&s. H.M.
1	S	Car strike in New Orleans, 1920	♈	4 26	7 40	11 55	4 32	7 35	11 57	4 54	7 12	morn
2	S	Third Sunday after Trinity	♈	4 26	7 40	morn	4 32	7 35	morn	4 55	7 12	0 1
3	M	Battle of Gettysburg, 1863	♈	4 27	7 40	0 28	4 33	7 35	0 30	4 55	7 12	0 38
4	T	Independence Day	♉	4 27	7 40	1 3	4 33	7 34	1 7	4 56	7 12	1 18
5	W	Battle of Carthage, 1864	♉	4 28	7 40	1 42	4 34	7 34	1 46	4 56	7 12	2 2
6	T	Beicos captured by Turks, 1920	♉	4 29	7 40	2 26	4 34	7 34	2 30	4 57	7 11	2 48
7	F	Reds captured Rovno, 1920	♊	4 29	7 40	3 13	4 35	7 34	3 18	4 57	7 11	3 37
8	S	Fred White, N.Y., a suicide, '01	♊	4 30	7 39	rises	4 36	7 33	rises	4 58	7 11	rises
9	S	Fourth Sunday after Trinity	♊	4 30	7 39	7 54	4 37	7 33	7 50	4 58	7 11	7 33
10	M	Peking under martial law, 1920	♋	4 31	7 38	8 32	4 37	7 33	8 28	4 59	7 11	8 14
11	T	Former Emp. Eugenie d., 1920	♋	4 32	7 38	9 4	4 38	7 32	9 0	4 59	7 10	8 50
12	W	Cyrus W. Field, died, 1892	♋	4 33	7 38	9 32	4 38	7 32	9 30	5 0	7 10	9 23
13	T	Frank Trumbull died, 1920	♌	4 33	7 37	10 0	4 39	7 32	9 58	5 0	7 10	9 55
14	F	Alfred Krupp died, 1887	♌	4 34	7 37	10 26	4 40	7 31	10 26	5 1	7 9	10 26
15	S	Earthquake in Greece, 1909	♌	4 35	7 36	10 56	4 40	7 31	10 57	5 1	7 9	11 0
16	S	Fifth Sunday after Trinity	♍	4 36	7 35	11 23	4 41	7 30	11 24	5 2	7 9	11 31
17	M	Shah of Persia abducted, 1909	♍	4 36	7 35	11 54	4 42	7 29	11 57	5 3	7 8	morn
18	T	Militarists lose in China, 1920	♍	4 37	7 34	morn	4 43	7 29	morn	5 3	7 8	0 7
19	W	Pa. Ry. drops 12,000 men, 1920	♎	4 38	7 34	0 27	4 43	7 28	0 30	5 4	7 7	0 44
20	T	Boston car strike ends, 1919	♎	4 39	7 33	1 7	4 44	7 27	1 11	5 5	7 7	1 28
21	F	Battle of Bull Run, 1861	♎	4 40	7 32	1 53	4 45	7 27	1 57	5 5	7 6	2 16
22	S	Sugar prices drop, 1920	♏	4 41	7 31	2 44	4 46	7 26	2 49	5 6	7 6	3 9
23	S	Sixth Sunday after Trinity	♏	4 42	7 30	3 44	4 47	7 25	3 49	5 7	7 5	4 8
24	M	Manton Marble died, 1917	♏	4 43	7 29	sets	4 48	7 24	sets	5 7	7 5	sets
25	T	St. James	♐	4 44	7 29	8 8	4 48	7 23	8 5	5 8	7 4	7 55
26	W	Earthquake at Naples, 1805	♐	4 45	7 28	8 46	4 49	7 22	8 44	5 8	7 4	8 38
27	T	Resolute Yacht wins cup, 1920	♐	4 46	7 27	9 20	4 50	7 22	9 19	5 9	7 3	9 17
28	F	W. M. Reedy died, 1920	♑	4 47	7 26	9 58	4 51	7 21	9 59	5 10	7 2	10 1
29	S	Chas. Henry Hart died, 1918	♑	4 48	7 25	10 32	4 52	7 20	10 33	5 10	7 1	10 40
30	S	Seventh Sunday after Trinity	♑	4 49	7 24	11 5	4 53	7 19	11 9	5 11	7 1	11 19
31	M	Fire in New Orleans, 1920	♒	4 50	7 23	11 43	4 54	7 18	11 47	5 12	7 0	morn

Gestation Table

July	Mare	Cow	Sow	Ewe
1	May29	Apr 9	Oct20	Nov28
2	30	10	21	29
3	31	11	22	30
4	June1	12	23	Dec 1
5	2	13	24	2
6	3	14	25	3
7	4	15	26	4
8	5	16	27	5
9	6	17	28	6
10	7	18	29	7
11	8	19	30	8
12	9	20	31	9
13	10	21	Nov 1	10
14	11	22	2	11
15	12	23	3	12
16	13	24	4	13
17	14	25	5	14
18	15	26	6	15
19	16	27	7	16
20	17	28	8	17
21	18	29	9	18
22	19	30	10	19
23	20	May 1	11	20
24	21	2	12	21
25	22	3	13	22
26	23	4	14	23
27	24	5	15	24
28	25	6	16	25
29	26	7	17	26
30	27	8	18	27
31	28	9	19	28



The Mud Holes That Made Labor of Driving —

Farming as a Business

Continued from page 21

farm. On 26 of these farms, crop yields were 12% below the average, but the labor income averaged $835.00 or 98% above the average because the cost of production was so reduced as to increase the margin. This is an unusual occurrence, however. Under most circumstances, more intensive methods than those in common practice make better profits. It requires study and judgment to know how intensive the farming methods should be for any crop, time or place.

Man and Team Labor

In the production of most crops, this is the largest item of expense. Its relative importance increases as the type of farming becomes more intensive. The efficiency of man labor in field operations is greatly increased by driving four and six-horse teams instead of one and two horses, and by using machinery with a large capacity. Power machinery, such as farm tractors and gas engines, have their place in farm work and often make for reduced cost of production.

Equipment

Good farm equipment is essential to successful farming. In the United States, the old regime of hand labor is past. Machines increase the work accomplished by the unit of labor. They tend to increase the size of business and result in getting work done on time. In most cases, they do the work better than it can be done by hand. Manure spreaders spread manure thinner and more evenly than it can be done by hand. Modern harvesting machinery does a better job than the old scythe and cradle. Seeding machines seed more evenly than it is done by hand.

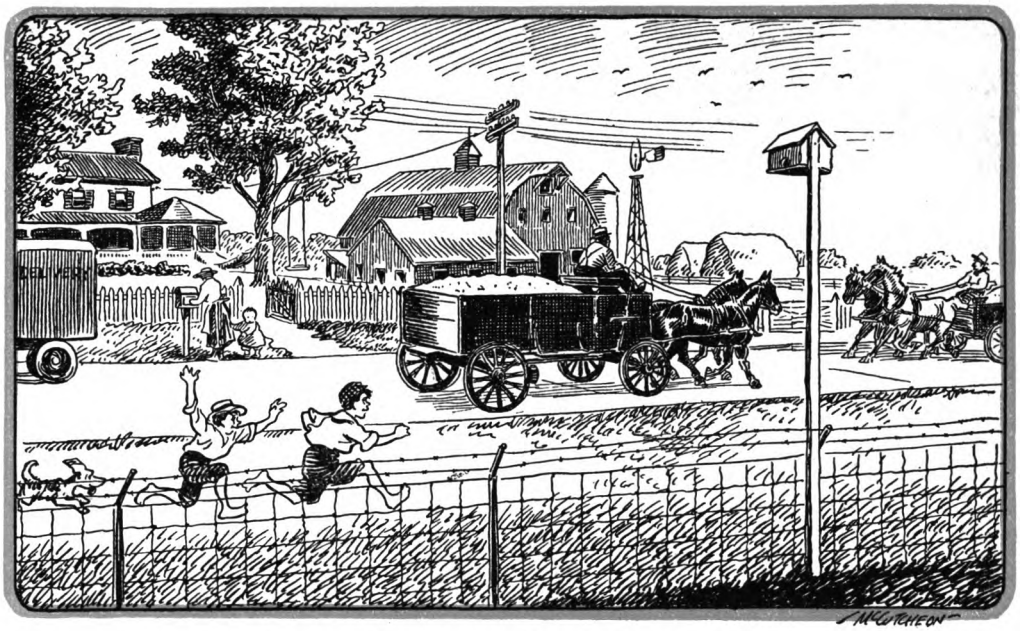
Soil Fertility

The soil is the foundation for successful agriculture. Without fertile soil or soil made so by artificial means farming is seldom profitable. Poor farming districts are, as a rule, accompanied by poor social conditions and a lack of educational and religious advantages. The better things of life are certainly dependent upon business success.

The necessary operations and the items of expense in producing a given crop on a poor soil are as great as on the good soil; often they are greater because the soil is poor. Productive soil, whether naturally so or made so by good methods of husbandry, makes for increased yields and a reduced cost of production per unit of crop grown.

Fertilizers Justify Themselves

Farmers are justified in the purchase and use of lime and commercial fertilizers to the end that the soil may be more productive and the cost of production reduced. It is good business to use such materials so long



Disappear Under the Hard Surfaced Roads of Today

as the resulting increase in crops will pay a profit on money so invested. It is possible to go too far in applying fertilizers and lime. The amount that may bring the maximum profit will depend on the nature and value of the crop grown. For intensive crops of high acre value, such as asparagus, cabbage, celery, early potatoes and some other early truck crops, the amount of fertilizer used may exceed one ton per acre. On the other hand, light applications only may be profitable on extensive crops, such as grass and spring seeded small grain.

In general farming, the fullest possible use should be made of all animal excrement. This should be saved and applied to the soil and for crops that will give the largest response and with as little loss of the plant food constituents by fermentation and leaching as possible. Crop rotations should be general and each rotation should contain not less than one good legume every four years. Such methods may be supplemented by the use of suitable commercial plant foods so far as returns justify. In most soils, phosphorus will be the dominant element needed but sandy soils and muck and peat soils will frequently respond to potash salts also. When farm manures are not available, a complete fertilizer should generally be used.

Fertilizing Potatoes

Continued from page 11

turns are obtained from the use of fertilizer on good soils than upon poor soils. This is due to the fact that the more vigorous plants produced in the good soil are in better condition to utilize the fertilizer and convert it into plant tissue.

There are two general methods of applying the fertilizer—broadcast and in the hill. Of the two methods, the choice should depend somewhat upon the manner of planting. Where the potatoes are planted in hills, three feet apart, it is recommended that the fertilizer be applied in the hill, but if the potatoes are planted in rows the fertilizer might better be applied broadcast, or at least a part should be broadcasted, and the remainder put in the row at the time of planting.

Broadcasting of the fertilizer has a tendency to cause a more extensive growth, which is a decided advantage in dry seasons. If the potatoes are machine planted the fertilizer can be most economically applied with a fertilizer attachment that drops the fertilizer along the row just ahead of the seed. If it is desired to broadcast the fertilizer, this may be conveniently done by means of a grain drill, setting it to drop the proper amount per acre. Dragging once or twice with a spike tooth harrow will thoroughly mix the fertilizer with the surface soil.

August

1st to 10th—Unsettled and blustery in states west of the Mississippi river. Great heat in most sections of the country at this time. Dry, dusty and parched conditions over states of the Middle West and Northwest.

11th to 20th—Variable period. Cloudy and showery weather in Georgia, Florida, Alabama and Mississippi. Wind and rain in California, Arizona and New Mexico. Cool and threatening in southeastern sections.

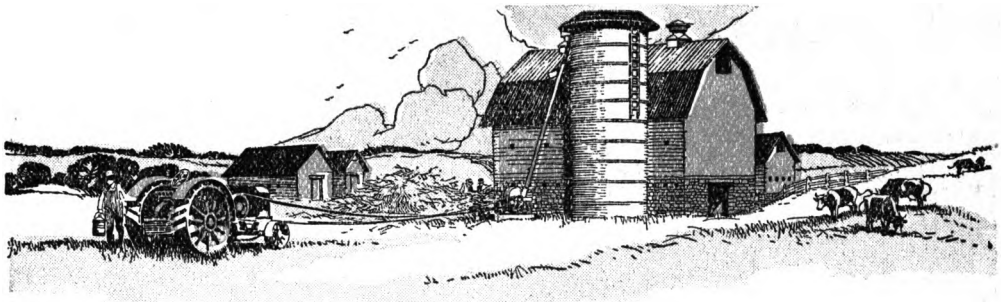
21st to 31st—Cool and frosty in sections along the Canadian border. Warm and showery in Gulf and South Atlantic states. Threatening over Middle Atlantic and New England states.

The temperature will be above the August normal. The rainfall will be most marked in states along the Gulf border from Texas to Florida.

Moon's Phases — **Eastern Time**

	D.	H.	M.	
Full Moon	7	11	19	M.
Last Quarter	15	3	46	A.
New Moon	22	3	34	A.
First Quarter	29	6	55	M.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES			Latitude of MIDDLE STATES			Latitude of SOUTHERN STATES			Gestation Table				
				Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Aug.	Mare	Cow	Sow	Ewe
1	T	Railway rates increase, 1920	♑	4 51	7 21	morn	4 55	7 17	morn	5 12	6 59	0 2	1	June29	May10	Nov20	Dec29
2	W	Earthquake in Illinois, 1887	♑	4 52	7 20	0 26	4 56	7 16	0 30	5 13	6 58	0 46	2	30	11	21	30
3	T	Plague in London, 1900	♒	4 53	7 19	1 11	4 58	7 15	1 16	5 14	6 57	1 35	3	July 1	12	22	31
4	F	Italian-Albn. Treaty made, 1920	♒	4 54	7 17	2 1	4 59	7 14	2 7	5 15	6 57	2 26	4	2	13	23	Jan 1
5	S	Chinese def. by Allies, 1900	♓	4 55	7 16	2 57	5 0	7 12	3 1	5 15	6 56	3 20	5	3	14	24	2
6	S	Eighth Sunday after Trinity	♓	4 56	7 15	3 53	5 1	7 11	3 57	5 16	6 55	4 14	6	4	15	25	3
7	M	Montenegro in World War, 1914	♈	4 57	7 14	rises	5 2	7 10	rises	5 17	6 54	rises	7	5	16	26	4
8	T	Ft. Gaines surrendered, 1864	♈	4 58	7 12	7 37	5 3	7 9	7 34	5 17	6 53	7 25	8	6	17	27	5
9	W	Battle Cedar Run, 1862	♉	4 59	7 11	8 4	5 4	7 8	8 1	5 18	6 52	7 56	9	7	18	28	6
10	T	Missouri a State, 1821	♉	5 0	7 10	8 28	5 5	7 6	8 28	5 19	6 51	8 27	10	8	19	29	7
11	F	Italy over run by anarchists, '20	♊	5 1	7 8	8 59	5 6	7 5	9 1	5 19	6 50	9 2	11	9	20	30	8
12	S	Eng. decl. War on Austria, 1914	♊	5 2	7 7	9 24	5 7	7 4	9 26	5 20	6 49	9 32	12	10	21	Dec 1	9
13	S	Ninth Sunday after Trinity	♊	5 3	7 6	9 54	5 8	7 2	9 56	5 21	6 48	10 5	13	11	22	2	10
14	M	Gen. E. F. Jones died, 1913	♋	5 4	7 4	10 25	5 9	7 1	10 29	5 21	6 47	10 41	14	12	23	3	11
15	T	Fighting at Ukia River, 1920	♋	5 5	7 3	11 2	5 10	7 0	11 6	5 22	6 46	11 21	15	13	24	4	12
16	W	Sir Lockyer, Scientist, died, '20	♌	5 6	7 1	11 44	5 11	6 58	11 48	5 23	6 45	morn	16	14	25	5	13
17	T	MacSwiney imprisoned, 1920	♌	5 7	7 0	morn	5 12	6 57	morn	5 24	6 44	0 6	17	15	26	6	14
18	F	Poet Beattie died, 1803	♍	5 8	6 58	0 31	5 13	6 55	0 36	5 24	6 43	0 55	18	16	27	7	15
19	S	Poles take 10,000 Reds, 1920	♍	5 9	6 57	1 26	5 14	6 54	1 31	5 25	6 42	1 50	19	17	28	8	16
20	S	Tenth Sunday after Trinity	♎	5 11	6 55	2 29	5 15	6 53	2 33	5 26	6 41	2 51	20	18	29	9	17
21	M	William X born, 1763	♎	5 12	6 54	3 38	5 16	6 51	3 42	5 26	6 40	3 57	21	19	30	10	18
22	T	New Mexico annexed, 1846	♏	5 13	6 52	4 50	5 17	6 50	4 53	5 27	6 39	5 4	22	20	31	11	19
23	W	Irish riots increase, 1920	♏	5 14	6 51	sets	5 18	6 48	sets	5 28	6 37	sets	23	21	June 1	12	20
24	T	St. Bartholomew	♐	5 15	6 49	7 55	5 19	6 47	7 55	5 28	6 36	7 55	24	22	2	13	21
25	F	J. H. Hanan, Shoe Mfgr., d., '20	♐	5 16	6 48	8 31	5 20	6 45	8 34	5 29	6 35	8 37	25	23	3	14	22
26	S	Battle of Dresden, 1813	♑	5 17	6 46	9 5	5 21	6 44	9 8	5 30	6 34	9 17	26	24	4	15	23
27	S	Eleventh Sunday after Trinity	♑	5 18	6 44	9 43	5 21	6 42	9 47	5 30	6 32	10 0	27	25	5	16	24
28	M	French recross Somme, 1918	♒	5 19	6 43	10 25	5 22	6 41	10 29	5 31	6 31	10 45	28	26	6	17	25
29	T	Brigham Young died, 1877	♒	5 20	6 41	11 11	5 23	6 39	11 15	5 32	6 30	11 33	29	27	7	18	26
30	W	G.E. Bissell, N.Y. Sculptor, d., '20	♓	5 21	6 40	11 59	5 23	6 37	morn	5 32	6 29	morn	30	28	8	19	27
31	T	British miners vote strike, 1920	♓	5 22	6 38	morn	5 24	6 36	0 4	5 33	6 27	0 23	31	29	9	20	28



September

1st to 10th—Fair, pleasant period for most points over central, southern and eastern states. Sultry temperatures in Oklahoma, Kansas, Nebraska, Missouri and Iowa. Blustery conditions over Lake region.

11th to 20th—Cool nights and mornings in states of the Southwest and Middle West. Blustery in Southern and Middle Atlantic states. Gales along all maritime shores.

21st to 30th—Cool weather for northwest and middle west sections. Wind and rain at many points west of the Mississippi river. Heavy fogs over Great Lakes.

The temperature will range about normal. The rainfall will be at about the usual average except in the Middle Atlantic and New England states, where it will be deficient.

Moon's Phases — Eastern Time

	D.	H.	M.	
Full Moon	6	2	47	M.
Last Quarter	14	5	20	M.
New Moon	20	11	38	A.
First Quarter	27	5	40	A.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES: Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of MIDDLE STATES: Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of SOUTHERN STATES: Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.
1	F	Lieut. Max Miller died, 1920	♓	5 23	6 36	0 52	5 25	6 34	0 57	5 34	6 26	1 16
2	S	Surrender of Atlanta, 1864	♓	5 24	6 34	1 48	5 26	6 32	1 52	5 34	6 25	2 10
3	S	Twelfth Sunday after Trinity	♈	5 25	6 33	2 45	5 27	6 31	2 49	5 35	6 24	3 4
4	M	Labor Day	♈	5 26	6 31	3 44	5 28	6 29	3 48	5 36	6 22	4 0
5	T	Obregon elect. Pres. Mex., 1920	♈	5 27	6 29	4 42	5 29	6 28	4 45	5 36	6 21	4 55
6	W	Pres. McKinley shot, 1901	♉	5 28	6 28	rises	5 30	6 27	rises	5 37	6 20	rises
7	T	Reds retake Omsk, 1920	♉	5 29	6 26	7 4	5 31	6 25	7 4	5 37	6 19	7 4
8	F	Strikers riot in N.Y., 1920	♉	5 30	6 24	7 28	5 32	6 23	7 31	5 38	6 17	7 34
9	S	Leon Tolstoi born, 1828	♊	5 32	6 23	7 57	5 33	6 21	8 0	5 39	6 16	8 7
10	S	13th Sunday after Trinity	♊	5 33	6 21	8 27	5 34	6 19	8 31	5 39	6 14	8 41
11	M	Hudson River disc., 1609	♊	5 34	6 19	9 0	5 35	6 18	9 4	5 40	6 13	9 20
12	T	Geo. Leighton died, 1920	♊	5 35	6 17	9 39	5 36	6 19	9 43	5 41	6 12	10 0
13	W	Steel strike at Joliet ends, 1901	♋	5 36	6 16	10 24	5 37	6 15	10 28	5 41	6 11	10 47
14	T	Aaron Burr died, 1801	♋	5 37	6 14	11 14	5 38	6 13	11 19	5 42	6 9	11 38
15	F	Pres. of France resigns, 1920	♋	5 38	6 12	morn	5 39	6 11	morn	5 43	6 8	morn
16	S	Explosion in Wall Street, 1920	♌	5 39	6 10	0 12	5 40	6 9	0 17	5 43	6 6	0 35
17	S	14th Sunday after Trinity	♌	5 40	6 9	1 15	5 41	6 8	1 19	5 44	6 5	1 36
18	M	Coal miners strike, Ala., 1920	♌	5 41	6 7	2 24	5 42	6 6	2 27	5 45	6 4	2 41
19	T	Labor troubles in Italy, 1920	♌	5 42	6 5	3 37	5 43	6 5	3 40	5 45	6 3	3 49
20	W	Ember Day	♍	5 43	6 3	4 54	5 44	6 3	4 56	5 46	6 2	5 0
21	T	St. Matthew	♍	5 44	6 2	sets	5 45	6 1	sets	5 46	6 1	sets
22	F	Ember Day	♍	5 45	6 0	7 1	5 46	5 59	7 3	5 47	6 0	7 11
23	S	Ember Day, Autumn begins	♎	5 47	5 58	7 38	5 47	5 58	7 42	5 48	5 58	7 52
24	S	15th Sunday after Trinity	♎	5 48	5 56	8 20	5 48	5 56	8 24	5 48	5 56	8 39
25	M	Gen. John Palmer died, 1900	♎	5 49	5 54	9 5	5 49	5 55	9 10	5 49	5 54	9 27
26	T	Riots in Ireland, 1920	♏	5 50	5 52	9 53	5 50	5 53	9 58	5 50	5 52	10 17
27	W	First railroad in England, 1825	♏	5 51	5 51	10 46	5 5	5 51	10 51	5 50	5 51	11 10
28	T	Reds routed in S. Russia, 1920	♐	5 52	5 49	11 43	5 52	5 49	11 47	5 51	5 50	morn
29	F	Michaelmas	♐	5 53	5 47	morn	5 53	5 48	morn	5 52	5 49	0 5
30	S	Poles smash Red Army, 1920	♑	5 54	5 45	0 40	5 54	5 46	0 44	5 52	5 48	1 0

Gestation Table

Sept.	Mare	Cow	Sow	Ewe
1	July 30	June 10	Dec 21	Jan 29
2	31	11	22	30
3	Aug 1	12	23	31
4	2	13	24	Feb 1
5	3	14	25	2
6	4	15	26	3
7	5	16	27	4
8	6	17	28	5
9	7	18	29	6
10	8	19	30	7
11	9	20	31	8
12	10	21	Jan 1	9
13	11	22	2	10
14	12	23	3	11
15	13	24	4	12
16	14	25	5	13
17	15	26	6	14
18	16	27	7	15
19	17	28	8	16
20	18	29	9	17
21	19	30	10	18
22	20	July 1	11	19
23	21	2	12	20
24	22	3	13	21
25	23	4	14	22
26	24	5	15	23
27	25	6	16	24
28	26	7	17	25
29	27	8	18	26
30	28	9	19	27

Feeding Livestock

By C. A. Willson, Professor of Animal Husbandry, College of Agriculture, Knoxville, Tenn.

THE feeding of livestock is necessary to the development of the human race. No race of people has ever developed except through the use of livestock as stepping stones in the development of its people. It is folly to state that a people can attain its highest development without livestock, for they minister to a large proportion of the needs of the civilized peoples. They supply shoes, hats, clothing, milk, medicines, motive power, glue, and food for human sustenance.

Livestock transforms nonedible foods into edible form. Such feeds as the grasses of the ranges, corn stover, silage, cheap hays, and grain by-products cannot be used for human food until transformed by animals into edible form. Every ton of well-cured oat straw is worth $10.00, every ton of barley straw is worth $9.00, every ton of wheat straw is worth $6.00, and every ton of well-cured corn stover is worth $10.00 for feeding purposes. Every foot of waste land on the farm should be grazed. All cheap feeds grown on the farm should be cured with care so as to be palatable for livestock and then be utilized by them.

Utilize All Roughages as Feed

The economical production of livestock is dependent upon the utilization of all roughages grown on the farm with enough grain to produce rapid growth during the growing period and maximum gains during the finishing period. The lowest cost of production with farm animals does not come through lowest amount of feed and the smallest gains but through liberal feeding and maximum gains. All feed is wasted when given to an immature animal that does not make some growth.

The pig that goes to sleep at night without having made some gain during the day has wasted the feed that was given it. Withholding feed in order to save it is wasting it. Farm animals should always be given all the feed that they will consume with a relish. It is only the character of the feed that should be changed.

Cattle that are being wintered over may be given cheaper feed than grain, such as well-cured corn stover, straws, and silage, but they should be given all they will consume with a relish. Hogs may be given cheaper ration through the use of luxuriant forage crops than full feeds of grain in dry lot. Horses may be wintered on cheaper feeds than full rations of hay. They should, however, be provided with all the clean, bright, cheap straw and stovers that they care to eat. It does not pay to withhold feed from farm animals.

Overfeeding Infrequently Done

Occasionally there are feeders who overfeed, although it does not often occur. The best rule is to feed only as much as the animals will clean up thoroughly before the next feed. Palatability is one of the principal factors in the feeding of farm animals. There is a greater secretion of digestive juices when a food is palatable to the animal, and hence a more thorough digestion. If animals on full feed do not clean up their feed from one feed to the next the feed boxes should be cleaned out, and fresh feed put in, in a little lessened amounts.

It is also important that not too much expense be incurred in the preparation of feeds. No more expense should be incurred than is necessary to make the feed palatable. The feed must pay for the expense involved in its preparation before it can begin to give returns on the investment. Multiplicity of operation in the feeding of farm animals means added expense. Cattle should not be fed singly in stalls where they can be fed in groups. Feeds should not be cut, shredded, or ground when they would give practically as good results without such operation.

Saving on Feed Cost

Livestock should not be fed three times per day when twice will do just as well. Corn broken from the stalk with the husk on and later ground with cob, husk and all will give as good results for cattle as corn that has had the extra operation and cost added to it of removing the husk. Corn broken in pieces with a hatchet in the feed bunks of the finishing cattle will be more profitable when hogs follow the cattle than corn that has had the extra expense added to it of grinding.

Hogs, except when on full feed during the last three weeks of the finishing period, make more profitable gains when fed ear corn than when fed ground corn. It is a common saying that "a sheep that cannot grind its own food is not worth having." It is doubtful whether it will pay to shred corn stover unless the corn can be husked more cheaply or the manure handled more economically. It will not pay to grind good, bright alfalfa hay, soybean hay, or cowpea hay for cattle, horses, or sheep. There is a tendency to add too much to the cost of feeding stuffs through extra manipulations of the feed.

The most economical feeds that can be produced on the farm are those that will

Continued on page 36

October

1st to 10th—Cloudy and threatening over states of the Pacific slope eastward to the Great Lakes. Warm and pleasant in Southern and Middle Atlantic states. Temperature 89 at Santa Fe, 90 at Fort Worth, 88 at Vicksburg, 86 at Nashville, 85 at Raleigh and 84 at Baltimore.

11th to 20th—Much wind and rain in southern and southwestern sections. Rising temperature in states of the Pacific slope, the Rocky Mountain region and the Middle West.

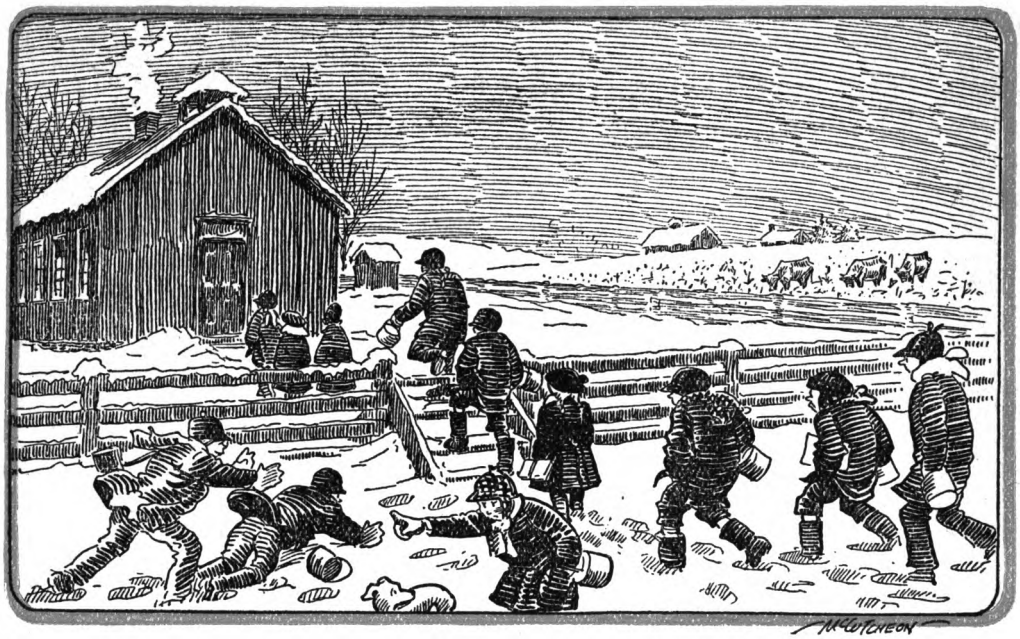
21st to 31st—Stormy weather over states of the Northwest and Middle West. Sleet and snow in Rocky Mountain region; very cold at all points north of Texas, Arkansas, Tennessee and Georgia.

The average temperature will be above the October normal. The rainfall will be deficient at all points except in states of the Pacific and Atlantic slopes, where it will be at or near normal.

Moon's Phases	Eastern Time D.	H.	M.	
Full Moon	5	7	58	A.
Last Quarter	13	4	55	A.
New Moon	20	8	40	M.
First Quarter	27	8	26	M.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of MIDDLE STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of SOUTHERN STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.
1	S	16th Sunday after Trinity	♋	5 55	5 44	1 38	5 55	5 44	1 42	5 53	5 47	1 55
2	M	Wm. Young, dramatist, d., 1920	♋	5 56	5 42	2 37	5 56	5 42	2 39	5 54	5 45	2 49
3	T	J. P. Elkins died, 1915	♋	5 57	5 40	3 34	5 57	5 41	3 36	5 54	5 44	3 43
4	W	Cyclone in West Indies, 1895	♋	5 58	5 38	4 34	5 58	5 39	4 36	5 55	5 42	4 38
5	T	Battle Thames, 1813	♋	6 0	5 37	5 31	5 59	5 38	5 30	5 56	5 41	5 29
6	F	Flood at Constantinople, 1913	♋	6 1	5 35	rises	6 0	5 36	rises	5 57	5 40	rises
7	S	Mrs. Holmes, novelist, d., 1907	♋	6 2	5 34	6 29	6 1	5 35	6 32	5 57	5 39	6 42
8	S	17th Sunday after Trinity	♋	6 3	5 32	7 26	6 2	5 33	7 5	5 58	5 37	7 19
9	M	Cork, Ireland, bombed, 1920	♋	6 4	5 30	7 39	6 3	5 31	7 43	5 59	5 36	7 59
10	T	Rev. Hudson Stuck, died, 1920	♋	6 5	5 28	8 21	6 4	5 29	8 25	6 0	5 35	8 43
11	W	Prince of Wales returns, 1920	♋	6 6	5 27	9 8	6 5	5 28	9 13	6 0	5 34	9 32
12	T	King of Greece ill, 1920	♋	6 7	5 25	10 0	6 6	5 26	10 5	6 1	5 32	10 24
13	F	Battle of Queenstown, 1812	♋	6 9	5 24	11 1	6 7	5 25	11 5	6 2	5 31	11 22
14	S	Strike riots in Italy, 1920	♋	6 10	5 22	morn	6 8	5 23	morn	6 3	5 30	morn
15	S	18th Sunday after Trinity	♋	6 11	5 20	0 6	6 10	5 22	0 9	6 3	5 29	0 24
16	M	Brit. Cr. "Hawke" sunk, 1914	♋	6 12	5 18	1 15	6 11	5 20	1 18	6 4	5 27	1 29
17	T	Chopin, musician, died, 1849	♋	6 13	5 17	2 27	6 12	5 19	2 28	6 5	5 26	2 36
18	W	St. Luke, Evangelist	♋	6 15	5 15	3 42	6 13	5 17	3 43	6 5	5 25	3 45
19	T	Rear-Adm. Bunce, died, 1901	♋	6 16	5 14	4 57	6 04	5 16	4 54	6 6	5 24	4 52
20	F	C. D. Warner died, 1900	♋	6 17	5 12	6 13	6 15	5 14	6 10	6 7	5 23	6 3
21	S	Paul O. Husting died, 1917	♋	6 18	5 11	sets	6 16	5 13	sets	6 8	5 22	sets
22	S	19th Sunday after Trinity	♋	6 20	5 9	6 54	6 17	5 11	6 58	6 8	5 21	7 15
23	M	Battle of Edgehill, 1642	♌	6 21	5 8	7 43	6 18	5 10	7 47	6 9	5 20	8 6
24	T	Daniel Webster died, 1852	♌	6 22	5 6	8 35	6 19	5 9	8 40	6 10	5 18	8 59
25	W	Mayor MacSwiney died, 1920	♌	6 23	5 5	9 33	6 20	5 7	9 37	6 11	5 17	9 56
26	T	Col. J. C. Underwood died, 1913	♌	6 24	5 3	10 30	6 22	5 6	10 34	6 12	5 16	10 51
27	F	U. S. Consul Osborn, died, 1901	♌	6 25	5 2	11 29	6 23	5 5	11 33	6 12	5 15	11 47
28	S	St. Simon and St. Jude	♌	6 26	5 0	morn	6 24	5 4	morn	6 13	5 14	morn
29	S	20th Sunday after Trinity	♌	6 28	4 59	0 28	6 25	5 2	0 32	6 14	5 13	0 43
30	M	Vice-Pres. Sherman died, 1912	♌	6 29	4 58	1 28	6 26	5 0	1 30	6 15	5 12	1 38
31	T	Halloween	♌	6 30	4 57	2 27	6 27	4 59	2 29	6 16	5 11	2 32

Oct.	Gestation Table Mare	Cow	Sow	Ewe
1	Aug 29	July 22	Jan 20	Feb 28
2	30	11	21	Mar 1
3	31	12	22	2
4	Sept 1	13	23	3
5	2	14	24	4
6	3	15	25	5
7	4	16	26	6
8	5	17	27	7
9	6	18	28	8
10	7	19	29	9
11	8	20	30	10
12	9	21	31	11
13	10	22	Feb 1	12
14	11	23	2	13
15	12	24	3	14
16	13	25	4	15
17	14	26	5	16
18	15	27	6	17
19	16	28	7	18
20	17	29	8	19
21	18	30	9	20
22	19	31	10	21
23	20	Aug 1	11	22
24	21	2	12	23
25	22	3	13	24
26	23	4	14	25
27	24	5	15	26
28	25	6	16	27
29	26	7	17	28
30	27	8	18	29
31	28	9	19	30



The Long, Cold Walk to the Little Red School—

Fertilizers Increase Corn Yields

Continued from page 4

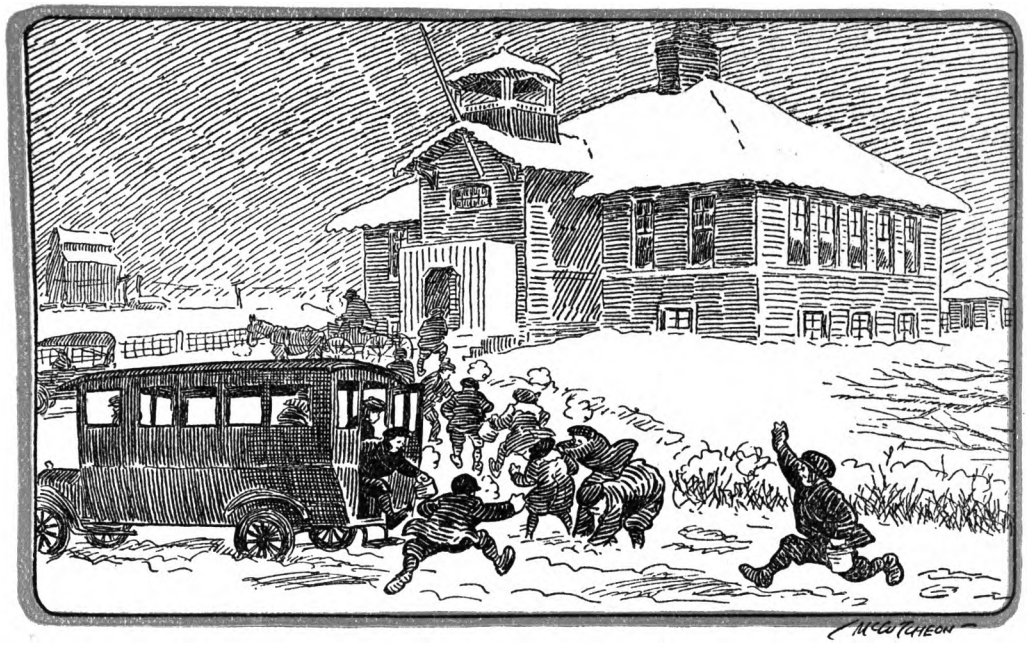
has increased the 13-year average yield by 11 bushels per acre. In 1920 the fertilizer plot yielded 35.7 bushels per acre more than the unfertilized soil, showing the cumulative and lasting effect of fertilization. Ground limestone and manure have also given excellent returns. In the experiments at Bedford, in Lawrence County, the average corn yields have been low but complete fertilizer has doubled the yield, giving an average increase of 18.8 bushels per acre. On the same land acid phosphate has increased the yield 15.5 bushels over limestone alone. Other experiments not conducted for so long a time are showing similar results.

Fertilizer on corn should be regarded as insurance. It supplies readily available food for the young corn plants at a critical stage in the development of the crop. When the season is backward, the soil cold, and soil processes slow, the corn plants must have available food or they become stunted, turn yellow and lose in vitality. Strong growing corn plants are not so likely to be injured by insects and disease as are the weak, poorly-nourished plants. High yields of corn are secured from those fields in which the plants grow and develop in a strong and healthy way from germination to maturity.

In these days of rapidly changing values it is difficult to make any definite statement as to costs or profits but we do know that, as a general rule, high yields cost less per bushel than low yields and are therefore more profitable. Corn that is supplied with plenty of available plant food gets from a week to ten days the start of unfertilized corn and maintains this lead throughout the season, matures earlier, frequently escaping an early frost, and produces corn of better quality and a higher feeding or sale value.

While phosphorus is usually the most important fertilizing element that can be added to the soil, small quantities of nitrogen can often be used to good advantage on spring-sown oats, since the plant makes the most of its growth early before much of the nitrogen of the soil has become available as plant food material. The application of a small amount of available nitrogen at seeding time will bring increased yields.

For heavy loams and clay soils, a good general fertilizer for oats is a mixture containing about 4% of ammonia and 12% of phosphoric acid, applied at the rate of 200 pounds per acre. The addition of 4% of potash to this mixture will usually prove to be beneficial on sandy or gravelly soils. When the crop is to be used for forage or green feed, rather than for the production of grain, manure or a fertilizer high in nitrogen may be used to good advantage.



Is Only a Story to the "Kids" of Today

Lessening Tobacco Production Cost

Continued from page 17

be as good as the sulphate. As a precaution against injury, growers should insist on formulas made from the sulphate of potash. Acid phosphate is the best source of phosphorus for tobacco.

Phosphate fertilizers are very important even in our soils supposedly high in natural fertility, and it frequently pays to apply this fertilizer alone or in conjunction with barnyard manure in the cigar-tobacco districts and in the Burley and dark-tobacco districts of Kentucky and bordering states.

The Danger of Root-rot

One important warning should be made in connection with the use of commercial fertilizers on tobacco. Where fertilizers are applied to so-called "worn-out" soils, it is well to be certain they are not "tobacco-sick" soils, that is, soils infested with root-rot, a disease which causes a stunting of plants almost identical with the stunting due to poor soil fertility or lack of sufficient soil moisture. It is better to select newer soils much lower in natural fertility, but free from root-rot and apply larger amounts of fertilizer, where the full benefit of the fertilizer can be obtained. This is the surest way of getting a good crop of high-grade tobacco.

Commercial fertilizers may be applied to tobacco in three different ways: 1, broadcasting as a top dressing shortly before planting; 2, application "in the hill" with a fertilizer attachment to transplanting machine at time of setting out; 3, applying in the row or between the rows following the transplanting of the crop. The practices vary locally, although, as a general rule, broadcasting is believed to be preferable except in very thin land.

It is hardly necessary to discuss recommendations for fertilizer applications in the different tobacco-growing districts. As was hinted above, they are similar in many respects and the grower needs only to keep in mind that tobacco is a heavy feeder, and must be supplied with liberal amounts of a high-grade fertilizer, rich in potash, which is free from chlorine. Considerable care should be given to the beds to keep them free from any kind of infection. In transplanting from beds to the fields, great care should be given to the whole process, both the removing of the plants from the bed and the placing them in the field. If growers will observe the customs of the most successful tobacco farmers in these processes, they will make the best use of the fertilizer applied to tobacco, and will produce good crops.

Improving Red Clover

By W. H. Stevenson, Professor of Farm Crops and Soils, Director Iowa Soil Survey, Iowa State College

DURING the past few years the farmers of the corn belt made a great effort to produce a maximum amount of food stuffs. The speed-up program of production in many cases, called for the continuous growing of grain crops and the cutting out of crops such as clover, which build up soil fertility when used in the right way.

This is an excellent time, when there is a surplus of corn and oats and prices are low, to take some portion of the farm and set about the job of making it richer and more productive with clover, and thus bring it into condition to produce corn, oats and other grain crops at a lower cost per bushel, than they can be grown on less fertile land. This cost of production factor is an important one under present economic conditions from the standpoint of both the consumer and producer.

As a rule, soils that produce large average yields give the farmer crops that are grown at a lower net cost per bushel or ton than is the case with crops grown on soils that produce low yields.

Studying Production Costs

In 1920 a cost of production study for corn on 337 Iowa farms showed the average cost to be 93 cents per bushel. But note these facts: on the farms that made average yields of 70 bushels, the net cost per bushel was 55 cents, whereas average yields of 36 bushels cost $1.25 per bushel.

A similar study for oats showed the average cost per bushel to be 75 cents. Yields of 67 bushels cost 30 cents per bushel and yields of 32 bushels cost $1.00 per bushel. In this connection it is worth while to note that if the production cost of 100 bushels of corn is $70 and the selling price is $80, the profit is just as large as though the production cost was $85 and the selling price $95. It is far safer, with conditions as they are at the present time, to attempt to grow corn for less than 75 cents per bushel than to hope for the selling price to be more than 75 cents per bushel.

Capacity Production Pays

Experience and many facts and figures indicate that the surest way to keep down production costs in the case of farm crops, is by securing large acre yields. In turn, under normal soil conditions, large yields can be secured only when the fertility of the soil is built up and maintained by proper methods of soil management.

Throughout the corn belt, red clover or some other legume, such as alfalfa and sweet clover, is an essential factor in an economical soil-building program. But in spite of this very important fact, many corn belt farmers shy off from clover and grow none at all or grow too small an acreage. No doubt this attitude, in some cases, is the result of many failures to secure a stand of clover, although high priced seed was used and some care was taken to grow a suitable nurse crop. In other cases, farmers have secured very light yields and have reached the conclusion that clover is not a paying crop as a money crop or as a green manure.

Clover Needs Lime Soil

But we must grow clover in the corn states, and one of the farmer's real jobs in that section of the country is to handle the crop in such a way as to secure the best results. If attention is given by the clover grower to certain important details, his chances for success will be much greater than would otherwise be the case. For example, clover likes a soil with lime in it. In the second place, clover yields may be greatly increased by the use of various fertilizers.

On some soils in Iowa, the yields have been doubled with these materials and in some cases even larger increases have been secured. These are significant facts, as they point the way to larger clover yields, which in turn assure larger supplies of relatively cheap nitrogen and organic matter that may be used for building up the fertility of the soil. A large number of field experiments have been carried on in Iowa in recent years on various soil types that show the remarkable effect of several different fertilizers on clover.

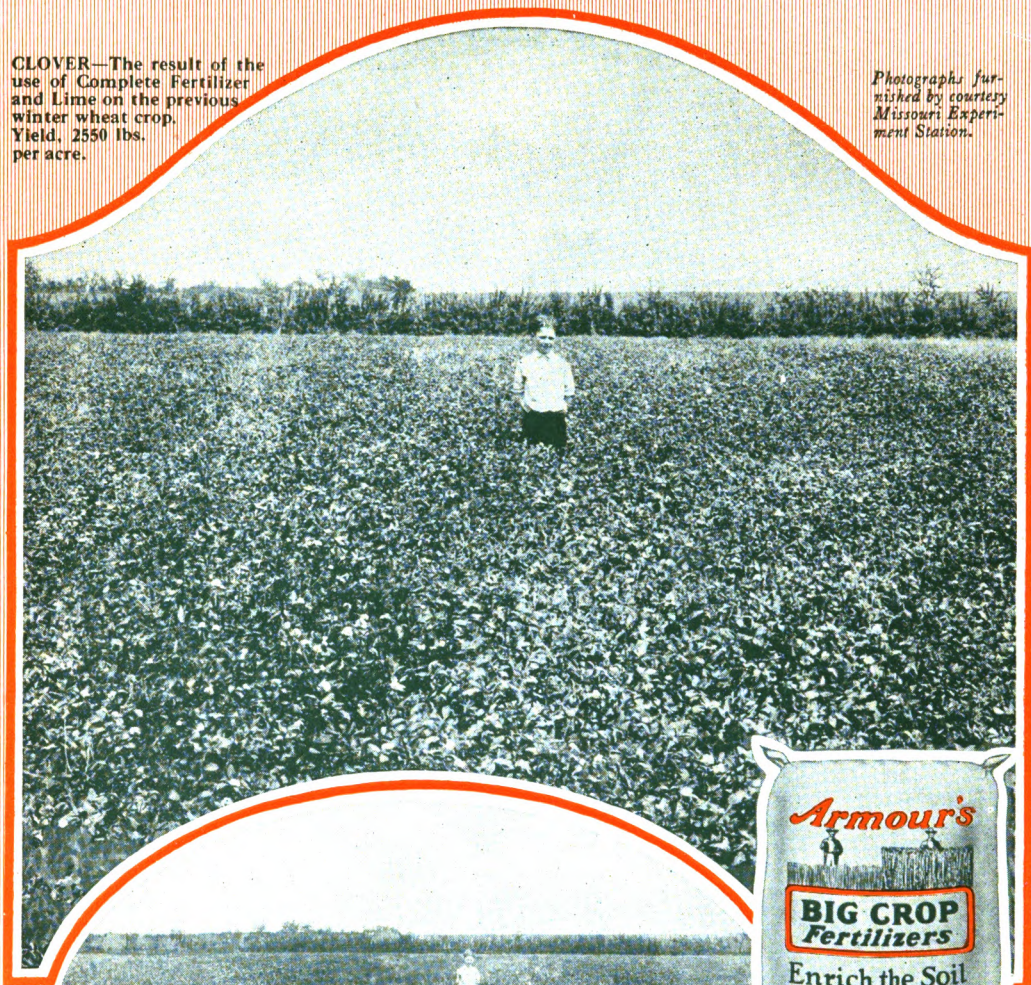
Fertilizers Prove Valuable

These experiments prove that on many soils lime and complete fertilizers tend to improve the stand of clover, reduce winter killing, promote growth and increase yields, and at a cost for the fertilizers that are used that justifies their purchase and application.

These results from field experiments carried on under actual farm conditions, are important because when they are generally known and understood, they will certainly encourage many farmers to grow more clover and cheaper clover and therefore take a very important step in solving their fertility problems. Too much emphasis cannot be placed just now on the need of the corn belt for millions of acres of clover in addition to that now grown. In each of our important corn states we should grow at least ten acres of clover for every acre that is grown at present.

CLOVER—The result of the use of Complete Fertilizer and Lime on the previous winter wheat crop. Yield, 2550 lbs. per acre.

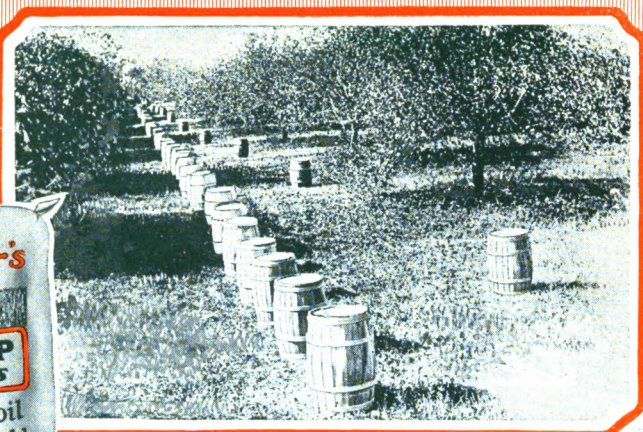
Photographs furnished by courtesy Missouri Experiment Station.



CLOVER — The result of no treatment on the previous winter wheat crop. Yield, 700 lbs. per acre, 50% weeds

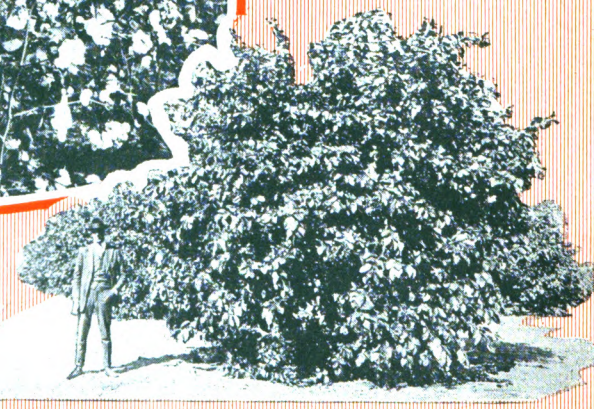
CLOVER—The result of the use of Lime only on the previous winter wheat crop Yield, 1600 lbs. per acre.

APPLES—46 barrels from 12 trees on the left fertilized with Complete Fertilizer. 9 barrels from 12 trees on the right receiving no treatment.
—*Courtesy Ohio Experiment Station*



COTTON — grown by Claude H. Pope, Dunn, N. C. Fertilized with Armour's BIG CROP Cotton Grower.

COTTON—grown by L. L. McMullan, Hartwell, Ga. 500 lbs. of Armour's BIG CROP African Cotton Grower, 9-3-3, used per acre. Yield, 2½ bales lint cotton per acre.



GRAPE FRUIT—7 year old trees in grove of W. D. Allen, Crooked Lake, Florida. A remarkable growth from 4 years use of Armour's BIG CROP Citrus Grower.

Cotton as a Money Crop

By R. J. H. DeLoach, Director Armour's Bureau of Agricultural Research and Economics

THERE is no set of conditions that would justify the southern farmer's dispensing with the cotton crop, or the setting it aside for other crops. That we must have a greater degree of diversification no one will doubt, but this diversification will mean the growing of better cotton and of a greater number of bales on fewer acres of land. It will mean a complete change from the "extensive" to the "intensive" system, and surely our only hope for the cotton farmer in the face of a world awakening in the growing of cotton, is improved methods and more fertile soils. Intensive cotton farming means farming somewhat like the best cotton farmers are farming today. It means getting more cotton than we are now getting, but getting it from fewer acres, and then leaving a much larger percent of the farm area to the growing of grains and livestock, and having an income four seasons rather than merely in the autumn and winter.

Cotton Always Will Be Needed

The world will always need cotton, and as civilization spreads over the present dark areas of the globe, we shall need millions of bales more than we are raising at the present time. We need cotton, not to take the place of wool or linen, or silk, but to maintain its own place as a covering for man's body and as a protection against the weather. Time was, and not many centuries ago, when cotton constituted only about 10% of man's clothing. At the present time it constitutes more than 33% and the proportion is increasing all the time. The figures apply to the human family as a whole. In the United States, cotton constitutes more than 50% of all the clothing used.

Weevil Districts Demand Variety Crops

Whether the weevil would have us grow cotton for his convenience and welfare depends upon the thriftiness of the farmer. We can grow for the weevil, or we can grow for ourselves. The best cotton farmers in Texas and Louisiana have learned to overcome the ravages of the weevil, and to make money growing cotton. They went through a period of depression and emerged wiser and better, and are today among the most thrifty farmers of the entire country. They have outwitted the weevil, and have triumphed in the face of his ravages.

Some of the things that such farmers have learned are as follows: early varieties of cotton must be grown in weevil districts; the crop must be pushed along as rapidly as possible, which means that the soil must be well fertilized, and with fertilizers that mature the crops as early as possible. The source of nitrogen in the fertilizers must be at least 50% mineral, and applied as the crop is planted and in liberal quantities. The crop must be cultivated rapidly and often, and the fallen squares all picked up and burned in fields where weevils are known to exist. Cotton farmers must be fighters in a weevil territory. They must be on the lookout for the enemy all the time, and not let him slip up as a thief in the night and steal the crop before he is aware. They must be trained soldiers and not afraid to fight, before breakfast, during the run of the day and after supper, if necessary. The fighting must be effective, which means based on the latest and best information as to the methods and habits of the enemy.

One of my first experiences with cotton was a study of a number of good cotton fields to get the effects of intensive cotton farming. I made a trip across the red hill sections of Georgia and South Carolina and made voluminous notes as to what farmers were doing, those who raised a bale to the acre and more. This was before the weevil had reached the sections I covered. Some of these original notes are very interesting to look over and study at the present time, in the light of all that has come about since they were written. The notes are dated in 1906, 1907 and 1908. One man said: "For ten miles around here no farmer produces more than a third of a bale to the acre except here on our farm where we do a little better than one and a quarter bales to the acre.

Food for Cotton Is Essential

"The people do not try to feed the cotton plants as they do their animals when they wish a good crop. They seem to think that there is some trick or magic in producing here on our farm, when, as a matter of fact, we rotate our cotton with corn, and then feed our corn crop, and feed the cotton crop still better. This year (1906) we used 500 pounds of 9-3-4 high grade fertilizer on this sixty acres of cotton and it is going to be the best investment we ever made. Cotton is 10½ cents today, and it will probably be ten by the time we get our first cotton on the market. At that rate we will pay for all costs, including the fertilizer, and then net just about three times as much per acre as the average farmer in this community. There is no magic about it. It is just good

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The Uninteresting Parlor of Grandmother's Time—

Feeding Livestock

Continued from page 28

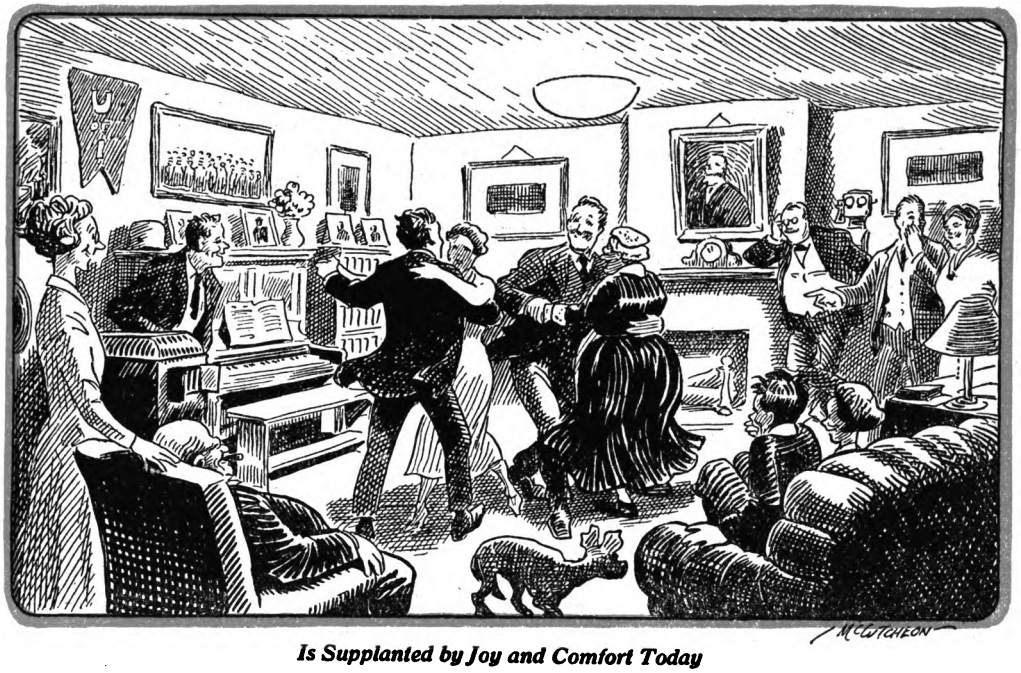
produce the largest amount of food nutrients per acre and will at the same time be the most palatable to farm animals. The ranking American feed crops are corn, silage, and alfalfa hay. Corn silage may be produced on good soils at the rate of twelve to sixteen tons per acre at an average cost of production of $3.00 per ton. Experiments have shown that $6.00 to $9.00 may be obtained for every ton of silage when fed to finishing steers. In an experiment at the Tennessee Experiment Station a value of $7.65 per ton was obtained for silage fed to finishing steers that received a medium amount of cottonseed meal for the concentrate ration. In most cases a ton of corn silage may be estimated to be worth, per ton, one-third the price per ton of timothy hay or, on the basis of corn, it may be stated to be worth, per ton, 8⅓ times the price of corn per bushel.

Cattle may be finished through the use of heavy grain rations with silage and hay. A moderate rate of gain and a fair finish may, however, be obtained through the use of cottonseed meal alone with silage.

When the cattle are first put in the feedlot in the fall an attempt should be made to secure a good "fill" with such cheap feeds as sorghum stover, hays, and silage and a small amount of cottonseed meal. Feed cottonseed meal during the first thirty days, three to four pounds per head, daily. Increase the meal during the second thirty days to five pounds and during the latter part of the finishing period to six pounds. Care should be taken at all times to pour the meal on the silage in the feed bunk and mix with the silage. When cottonseed meal is fed in this manner there is but little danger in its use in the amounts given. In fact, as much as eight pounds may be fed with safety if the increases are made gradually. Gains of 1¾ to 2¼ pounds daily may be maintained throughout the finishing period and at less cost than through the use of the more expensive grains. When corn is low in price it may be added during the latter half of the finishing period to the extent of eight to ten pounds daily and the cottonseed meal maintained at four pounds daily.

All classes of farm animals will make most economical gains when they have been given a liberal supply of protein and mineral matter through the use of such feeds as cottonseed meal, linseed meal, tankage, and other protein feeds.

The grain ration of the hog will always give best results when balanced with tankage or other protein feeds. A very good rule for feeding tankage to hogs weighing 125 pounds or more is to feed one-quarter to one-half pound per head daily.



Is Supplanted by Joy and Comfort Today

Fertilizing the Oat Crop

Continued from page 14

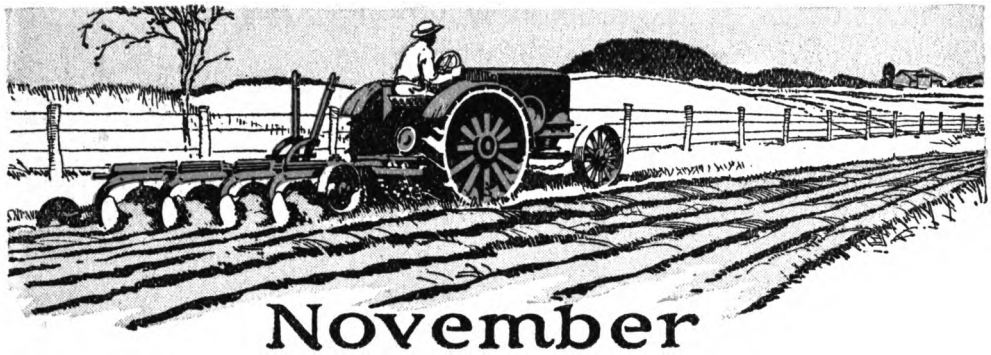
of phosphoric acid and 2% to 4% of potash. When oats follow corn or some other non-legume on soil not capable of producing 40 bushels of corn, profitable returns are often obtained if, in addition to the regular fertilizer used in the fall, a mixture of ammonia and phosphorus is used as a top-dressing in the spring.

Except on very poor soil, the direct application of stable manure to the oat crop is seldom advisable, since more satisfactory results can usually be obtained by applying the manure to some other crop in the rotation, such as corn. This practice enables the oat plant to get the benefit of a part of the manure and avoids the danger of a rank growth of straw at the expense of the grain.

Fertilizing by Indirect System

On the Frostburg field in the western part of the state the Maryland Experiment Station is growing oats in a three-year rotation of potatoes, oats, clover, applying all of the manure and fertilizers to the potato crop. The soil of this field is a fertile gravelly loam. The use of 20 tons of manure and 1,000 pounds of acid phosphate per rotation has increased the yield of potatoes from 152 bushels to 207 bushels per acre; clover from two tons to almost three tons, and oats from 51 bushels to 60 bushels. By the indirect system of fertilization used in this rotation the oat crop is receiving the benefit of the residual effect of the fertilizer treatment without danger of damage from over-fertilization, which might result from an application direct to the oats.

In a great majority of the spring oat sections of the United States, phosphorus is most often the limiting element of plant food material. This is particularly true in the middle west and the upper Mississippi Valley, where a large percentage of the oat crop is grown. In a rotation of corn, oats, wheat, clover, grown at the Ohio Experiment Station, on a scale of 10 acres for each crop, manure reinforced with phosphorus is applied to the clover sod at the rate of 10 tons per acre and plowed under for corn. The oats in this rotation receive no direct application of fertilizers but the wheat gets 200 pounds of steamed bone meal, 1,000 pounds of acid phosphate and 40 pounds of potash, applied in the fall. In the spring the wheat is top-dressed with nitrate of soda at the rate of 60 pounds per acre. Over a period of eight years, this treatment has given an average increase of 50 bushels of corn, 31 bushels of oats, 21 bushels of wheat and about 2 tons of hay.



November

1st to 10th—"Indian Summer" conditions at most points east of the Mississippi river. Local showers in states of the Ohio Valley, New York and New England.

11th to 20th—Very blustery conditions on Pacific slope, Rocky Mountain region, the Northwest and Middle West. Wind and rain in Southern states. Foggy and damp in states of the Gulf and South Atlantic borders.

21st to 30th—Rain, sleet and snow in northern and western sections. Pleasant conditions over southern and eastern sections. Unsettled weather conditions in all states bordering on the Great Lakes and the North Atlantic.

The temperature will range slightly above the average. The precipitation will be below the November average except in the Northwest, where it will be abundant.

Moon's Phases (Eastern Time)	D.	H.	M.	
Full Moon	4	1	37	A.
Last Quarter	12	2	53	M.
New Moon	18	7	6	A.
First Quarter	26	3	15	M.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of MIDDLE STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Latitude of SOUTHERN STATES Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.
1	W	All Saints' Day		6 32	4 55	3 24	6 28	4 58	3 24	6 17	5 10	3 24
2	T	Harding and Coolidge el., 1920		6 33	4 54	4 22	6 30	4 57	4 20	6 17	5 9	4 16
3	F	Panama Independ. Proc., 1903		6 34	4 53	5 21	6 31	4 56	5 19	6 18	5 9	5 12
4	S	Jennings, La., fire, 1901		6 35	4 51	rises	6 32	4 55	rises	6 19	5 8	rises
5	S	21st Sunday after Trinity		6 36	4 50	5 40	6 33	4 53	5 43	6 20	5 7	5 58
6	M	Gen. Meade died, 1872		6 38	4 49	6 19	6 35	4 52	6 23	6 21	5 6	6 41
7	T	Dr. S. J. Meltzer died, 1920		6 40	4 48	7 4	6 36	4 51	7 9	6 22	5 5	7 28
8	W	Emp. of China died, 1908		6 41	4 47	7 56	6 37	4 50	8 1	6 23	5 4	8 20
9	T	John Milton died, 1674		6 42	4 45	8 53	6 38	4 49	8 57	6 24	5 4	9 14
10	F	Lieut. Morrison died, 1900		6 43	4 44	9 54	6 39	4 48	9 58	6 25	5 3	10 15
11	S	Drop in price of sugar, 1920		6 44	4 43	11 0	6 41	4 47	11 3	6 26	5 2	11 16
12	S	22nd Sunday after Trinity		6 45	4 42	morn	6 42	4 46	morn	6 26	5 1	morn
13	M	George Fox died, 1690		6 46	4 41	0 10	6 43	4 45	0 13	6 27	5 1	0 21
14	T	Wm. G. Choate, N.Y., d., 1920		6 48	4 40	1 22	6 44	4 44	1 24	6 28	5 0	1 28
15	W	Revolution in Brazil, 1889		6 49	4 39	2 33	6 45	4 43	2 33	6 29	5 0	2 33
16	T	Col. W. H. Powell, U.S.A., d., '01		6 50	4 39	3 45	6 46	4 43	3 43	6 30	4 59	3 39
17	F	Brit. Ship "Angelia" sunk, 1915		6 52	4 38	5 2	6 48	4 42	4 59	6 31	4 59	4 50
18	S	Harding sails for Panama, 1920		6 53	4 37	6 10	6 49	4 41	6 12	6 32	4 58	5 59
19	S	23rd Sunday after Trinity		6 54	4 36	sets	6 50	4 40	sets	6 33	4 58	sets
20	M	A. E. Elmer died, 1901		6 55	4 35	6 20	6 51	4 40	6 25	6 33	4 57	6 44
21	T	Vice-Pres. Hobart died, 1899		6 56	4 34	7 16	6 52	4 39	7 22	6 34	4 57	7 39
22	W	G. W. Breck, died, 1920		6 58	4 34	8 15	6 54	4 38	8 19	6 35	4 56	8 37
23	T	Bishop D. H. Moore died, 1915		6 59	4 33	9 16	6 55	4 38	9 20	6 36	4 56	9 36
24	F	Dr. Moses D. Hoge, Jr., d., 1920		7 0	4 33	10 16	6 56	4 37	10 20	6 37	4 56	10 32
25	S	Havelock died, 1857		7 1	4 32	11 16	6 57	4 37	11 19	6 38	4 55	11 28
26	S	24th Sunday after Trinity		7 3	4 32	morn	6 58	4 37	morn	6 39	4 55	morn
27	M	1000 arrests in Ireland, 1920		7 4	4 31	0 15	6 59	4 36	0 18	6 40	4 55	0 23
28	T	W. Irving died, 1359		7 5	4 31	1 15	7 0	4 36	1 16	6 41	4 55	1 17
29	W	Ohio admitted, 1802		7 6	4 30	2 11	7 1	4 35	2 10	6 42	4 54	2 8
30	T	St. Andrew		7 7	4 30	3 10	7 2	4 35	3 8	6 43	4 54	3 2

Gestation Table				
Nov.	Mare	Cow	Sow	Ewe
1	Sept 22	Aug 10	Feb 20	Mar 31
2	30	11	21	Apr 1
3	Oct 1	12	22	2
4	2	13	23	3
5	3	14	24	4
6	4	15	25	5
7	5	16	26	6
8	6	17	27	7
9	7	18	28	8
10	8	19	Mar 1	9
11	9	20	2	10
12	10	21	3	11
13	11	22	4	12
14	12	23	5	13
15	13	24	6	14
16	14	25	7	15
17	15	26	8	16
18	16	27	9	17
19	17	28	10	18
20	18	29	11	19
21	19	30	12	20
22	20	31	13	21
23	21	Sept 1	14	22
24	22	2	15	23
25	23	3	16	24
26	24	4	17	25
27	25	5	18	26
28	26	6	19	27
29	27	7	20	28
30	28	8	21	29

Cotton as a Money Crop

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business judgment, just as in any other vocation, and the cotton farmer who invests this along with all else will make money growing cotton.

Helping Tenants Make Good

"Some years ago I got one of my neighbors to try my method on five acres. He did so well that he has about equaled anything I ever did in the way of yields per acre, and is now on the road to success as a cotton farmer. I suppose he would not feel very well if he heard me say this, but it is a fact, nevertheless. Up to the time I urged him to try a better method, he always claimed that 'the old way was good enough for him.' One thing about our cotton farming in this community is the large number of negro tenants. Some farmers think it will not do to invest very much money in fertilizers where the farms are in the hands of negroes. I have tried this and with good effect. My farm across the river, which you can see from here, is worked by negro tenants. This year I thought well enough of my methods with tenants to try 400 pounds of good fertilizer per acre, and I will take you over there this afternoon and let you decide for yourself whether you think it is a paying proposition. Tenants need help and advice and will make money for land owners and for themselves, if the proper assistance is given them at the right time and in the right way. Most of the negro tenants are good cotton farmers, but they need to be educated on improvement lines, and if you will give them good advice and plenty of things to make a crop with, they will make it and gather it, too."

Others Follow the Lead

During this entire trip, I talked in this way with a great many farmers and they all had about the same story to tell. They thought that the only way to make cotton farming pay is on the intensive plan. Make more per acre and you reduce the cost to grow, and increase your profits. There was not a single exception to this. Every farmer felt the same way about this—especially the thrifty farmers—the ones that were making money cotton farming. At that time the boys' and girls' club work had just started, had not gotten a hold on the people, but there were a few members in Georgia. If I remember, there was no such organization at the time in South Carolina. At one farm in Georgia a boy was trying to win a prize with the largest cotton yield in history. He had put more than a thousand pounds of high grade commercial fertilizer to the acre, and thirty tons of barnyard manure, and he surely had a patch full of plants; but they looked to me like they would throw the crop a little too late for maximum yield, as I told the father of the boy. As a matter of fact the crop was late and the boy did not get the high yield, but he did win the second prize.

Must Study Plant Foods

This suggests to us the importance of making a study of the sources of plant food in order to secure the best results. Too much organic matter, rich in nitrogen, will always throw the cotton crop late. There is no question but what manures are always good for the land, but it would pay better as a general thing to apply them to corn the year before and then use heavy applications of fertilizer on the cotton crop. This will give results as practically no other practice will. The yield will be heavy, the crop will come off early, and the effect of the weevil will be reduced to a minimum. Large quantities of farm manure applied direct to cotton will invariably delay the crop by ten days or two weeks, and sometimes more. At the same time, there would be no objection to applying smaller quantities of manures to cotton, in order to insure slightly larger plants, and a little better branching system, all of which gives capacity to the plant for heavier fruitage. If we had to choose between using a limited quantity in this way and putting it on the corn crop, we would prefer every time to manure the corn and fertilize heavier the cotton. It would be still better to use fertilizer and manure on both crops. That is the ideal way to make good crops and build up land at the same time. With the manure on corn at least 200 pounds of fertilizer per acre should be applied, and with the manure on cotton, 500 pounds. Most farmers apply far less than this, and in return get small crop yields.

Intensive Method Pays

My own experiences with cotton, which cover a long period of years, prove that the intensive method pays whether the price of cotton is high or low. I was, perhaps, the first grower to produce more than three bales to the acre and have the weights certified. This I did by preparing the soil two or three years ahead—plowing deep and growing other crops ahead of cotton. Then when it came time for cotton to go to the bat, I planned a fertilizer system that gave me the results I was looking for—indeed, far better results than I had hoped for. The seed bed was thoroughly prepared in late March; ten tons of manure were put in the drill row, and 580 pounds of a 10-3-4 fertilizer also applied in the drill row, and thoroughly mixed with the soil before planting. Some farmers forget to properly mix the fertilizers with the soil before planting. It makes a big difference at harvest time. Don't forget to mix the fertilizers in with the soil before planting the seed.

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The Tin Wash Pan by the Back Porch Pump—

Feeding for Better Hogs

By P. V. Ewing, M. S., formerly Swine Husbandman of the Texas Experiment Station

UT few breeders and feeders of swine now attempt to raise and fatten hogs without making use of the essential supplemental feeds—meat meal and raw bone meal. Comparatively speaking they have been only recently introduced into our swine dietary, but the very general use now made of them speaks amply of the high esteem in which they are held by practical hog men.

Meat meal is the ground residue from animal tissues exclusive of the bones, hoofs, and horns. It is prepared for feeding purposes by cooking in tanks under about fifty pounds of steam pressure. After the cooking process has been completed the grease and water are drawn off, and the remaining meat residues are subjected to hydraulic pressure, then dried and finely ground. As manufactured in a well-equipped plant, meat meal is strictly a high grade feeding product of uniform and known value. Only meat meal made by well-known and established firms should be used. Low grade feeding tankage is often insufficiently dried or sometimes scorched in drying, so that uniform and satisfactory results cannot be depended upon.

Meat meal is valuable as a feed largely because of the animal protein it contains. This runs from forty per cent in the lower grade tankages to sixty per cent in the high grade tankages. The moisture content ranges from five to ten per cent. Eight per cent moisture is a good average. If there is much more than this, caking and spoiling may occur. Meat meal tankage contains practically no carbohydrates, but does contain from five to fifteen per cent or more of fat which has high nutritive value. In addition to these nutrients it contains from ten to twenty per cent of ash, which is largely bone ash and has high value as a mineral nutrient in our swine rations.

Why Meat Meal Is Palatable

Meat meal is very palatable to hogs. Rations containing it are greatly relished and consumed in large quantities, and it is, in fact, the most palatable feed we have for hogs. This is true because it is so rich in

Continued on opposite page

Has Lost Its Terrors in the Modern Farm Home

Feeding for Better Hogs

Continued from preceding page

the nutrients which the hog's body needs for growth and development.

Its palatability is taken advantage of in fattening hogs, especially because by the use of the meat meal in the feed, larger consumption and quicker and more economical gains are secured. The palatability of the product is no small factor in the quite general success with which meat meal has met as a swine feed.

Meat Meal Supplements Grains

Meat meal supplies those nutrients in which our home grown grains are deficient; namely, protein and mineral matter. It not only supplies these more economically than they can be produced on the farm, but the results of numerous experiments conducted at different experiment stations have shown that they are more efficient.

That meat meal is an ideal supplement for corn has been shown most forcibly by Professor Smith, of the Indiana Experiment Station, who summarized the results of fifteen practical individual feeding tests conducted at six different experiment stations. Each test was a comparison of corn and tankage against corn alone when fed in dry lot to pigs averaging 138 pounds when the experiment began.

As a result of these experiments it was found that the pigs fed corn and meat meal gained 56 per cent more than those fed corn alone, and were 46 pounds heavier at the close of the average feeding period. The fact that the pigs fed corn and meat meal ate 1.3 pounds of feed daily in excess of that consumed when corn alone was fed, testified to the palatability of the meat meal.

What Meat Meal Is Worth

Professor Smith's work showed further that not only were gains made faster when the meat meal was fed with the corn, but that the gains were made on less feed. In these tests the feeding of 40.21 pounds of tankage saved 165.74 pounds of corn, or one pound of meat meal in the balanced ration had the value of 4-12 pounds of corn in the ration alone.

In other words, under the average conditions represented in these experiments, when a bushel of corn is worth one dollar, a ton of meat meal is worth $147.14.

When Meat Meal Should Be Fed

Meat meal is the ideal protein feed for all kinds of hogs. It is necessary for growing pigs, to provide them with the right sort of proteins for growth and development. The

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Feeding for Better Hogs

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brood sow needs meat meal so she can produce the strongest and healthiest pigs. She needs the protein for her own body functions and to nourish the pigs properly, both before and after farrowing.

Meat meal is the ideal protein supplement for both breeding and fattening hogs, but smaller quantities or percentages are required for fattening swine. It is necessary so that fattening hogs can continue growth and provide the place for storage of fat. It increases consumption of feed and leads to more rapid and economical production.

The amount of meat meal that should be fed varies with the kind of hogs and the other feeds it supplements. No ration should contain less than five per cent, as in the later fattening period, and it can be profitably fed to constitute fifteen per cent of the ration in the case of feeding weakling pigs. Feeding standards should be followed and meat meal should be used to balance the rations. Most of the meat meal can be fed mixed in with the other feeds, but a great deal of it is fed, especially to fattening hogs, by placing it before the hogs in a compartment of a self-feeder.

It has been found that the hogs are very good judges of the most profitable proportion of meat meal, and the self-feeder method of feeding is rapidly growing in use.

What Other Experiments Proved

Professor Evvard's classical experiments on swine feeding have given the American farmer the Standard Corn Belt Hog Ration. The ration is made up of corn with meat meal tankage to balance. It has proven so economical and has produced gains so rapidly that it is used as the standard ration by which the value of all other swine rations is measured.

The Iowa station has definitely confirmed what other experiment stations have also proven time and again, and has established beyond all question that a ration made up of corn and meat meal tankage is the ideal swine ration under average conditions.

As the name implies, raw bone meal consists of raw, ground bone. It is made from clean, sound bones from healthy animals. It analyzes high in protein, and especially high in ash. From the standpoint of swine feeds it ranks next to meat meal as an important packing-house feed product. This product must not be confused with steamed bone used for fertilizer.

Why a Hog Needs Minerals

From three to six per cent of the hog's body is made up of mineral matter. Mineral matter is absolutely necessary to the health and development of the pig. While many of our rations are not deficient in minerals, if rations contain a high percentage of grain they are apt to be very deficient. Corn in particular is apt to be deficient, and this is the grain on which hogs are so largely fed.

These minerals are necessary for growth of the skeleton and other tissues and for the proper functioning of practically all life processes, and if we are to secure normal growth and development it is essential that an adequate mineral supply be provided.

Bone meal offers the easiest, cheapest, and most logical means of supplying this deficiency.

Raw bone meal is especially necessary for brood sows and growing pigs. It is more essential that breeding animals be provided with ample mineral elements than in the case of fattening swine.

Need for Breeding Rations

Most breeding rations require an added mineral supply while there are many fattening rations where this is not necessary. Bone meal is important in the case of pigs and brood sows to insure maximum growth and development. Breeding animals cannot reproduce properly unless amply supplied with the necessary materials out of which to grow or make pigs, any more than a builder can make a house without all the essential parts.

Professor Burnett, of the Nebraska Experiment Station, conducted some tests in which he supplemented corn with bone meal and other sources of mineral supply. None of the other supplements ranked with bone meal, and the breaking strength of bones from pigs fed corn and bone meal was 109 per cent greater than from pigs fed corn without bone meal. This experiment and other experiments conducted at other experiment stations supply emphatic evidence of the lack of proper bone building material in corn and show how valuable bone meal is for supplying these necessary minerals.

How Best to Feed Bone Meal

Bone meal can either be successfully mixed in the feed in proper proportions or it can be fed as a supplemental mineral mixture. When mixed in the feed it is usually fed to constitute one per cent of the ration, but the percentage depends on the particular ration and the kind of hogs to which it is to be fed.

Many feeders make up a mineral mixture of charcoal, common salt, and bone meal, and allow the hogs to have free access to this at all times.

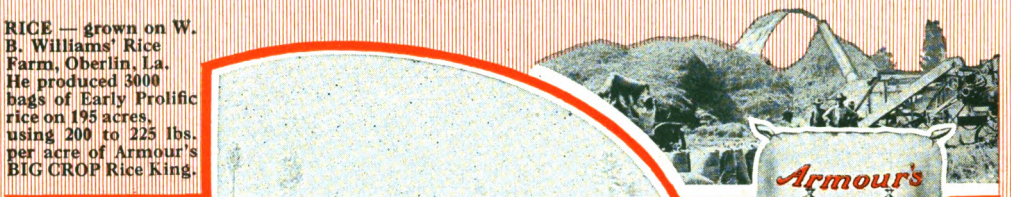
POTATOES—the two center unfertilized rows dug, together with two outside fertilized rows dug for comparison.

POTATOES—
Grown on the Campbell Farm of The L. Starks Company, Three Lakes, Wisconsin. The two center rows unfertilized; the balance of the field fertilized with Armour's BIG CROP Potato Fertilizer

POTATOES—the production of the two center unfertilized rows, 2½ crates, many small and unmarketable.

POTATOES—the production of the two outside fertilized rows, 6½ crates, all large and marketable.

RICE — grown on W. B. Williams' Rice Farm, Oberlin, La. He produced 3000 bags of Early Prolific rice on 195 acres, using 200 to 225 lbs. per acre of Armour's BIG CROP Rice King.



RICE — grown on farm of John Leger, Jr., Morse, La. Armour's BIG CROP Rice King used. Produced 10 bags rough rice per acre against 7 bags with Acid Phosphate and 5 bags unfertilized. This rice milled 91 lbs. of clean rice per 162 lb. bag of rough rice against 82 lbs. for the rice fertilized with Acid Phosphate.

SUGAR CANE—Armour's BIG CROP Sugar Cane Grower used. Grown on plantation of F. M. Burley, Youngsville, La. Yield double unfertilized cane, and sugar content higher.

SUGAR CANE—to right, view of fertilized cane on plantation of Bellevue Planting Company, Youngsville, La. Yield, 25 tons per acre. Above—Overton Cade, President, holding stalks of fertilized and unfertilized cane.

SUGAR CANE—grown by Bellevue Planting Company Youngsville, La. Unfertilized. Yield 11 tons per acre.

Club Work in Modern Agriculture

By G. L. Noble, Secretary, National Committee on Boys' and Girls' Club Work

IF ONE were to take a trip around the world and investigate the methods of agricultural production, the crops, the yields, and the livestock, greatly varying conditions and results would be found. In France, for instance, one would be struck with the extreme care with which every parcel of ground is utilized. Very careful tillage, much of it done by hand, with practically no waste in fences and corners, is noticeable. The fields are fairly small, compared to many of the farms in the United States.

In China, similar conditions prevail; but perhaps a more outstanding feature of Chinese agriculture is the extreme care that is used to save every element which may be used to fertilize the soil. It should be remembered that China is probably one of the world's oldest nations, and that a large amount of her productive land has been farmed for three or four thousand years. Hence it is most essential that her soil fertility be maintained. So we might go on and enumerate other countries, such as Germany, the United Kingdom, and Japan. Economic necessity—or in other words, the need for human food—has brought about the varying practices which are peculiar to each country.

Agricultural Systems Compared

The results obtained speak for themselves. For instance, taking the case of wheat, which, being grown in nearly every country in the world, is a good criterion upon which to base judgment, it is found that France produces an average yield of about 20 bushels per acre; Great Britain, approximately 32; Germany, 27; Italy, 18 to 20; and in China, while statistics are not available for the entire country, yields of 40 to 42 bushels are not uncommon.

In the countries mentioned, the amount of livestock per capita is much smaller than in the western continents of North and South America. In fact, our whole system of agriculture, in the United States especially, is much different from that in thickly populated European and Asiatic countries.

In the United States our farms are comparatively large; power machinery and improved farming machinery are used to a much greater extent, and we therefore have, in this country of ours, probably a larger production per man than in the more thickly settled countries. In comparing our yields per acre, however, we find them to be lower as judged by wheat production. For the last four or five years the average yield of wheat in the United States is only 15.4 bushels per acre, and we have declined from an average of over 18 bushels in 1916 to 14.9 bushels, according to recent figures.

Intensive Operations Are Imperative

Along with this fact it should be remembered that because of the peculiar advantages inherent in the principles of this republic, it is fast increasing in population. Many foreign peoples are immigrating to our shores in order that they may have the opportunity and freedom not found in other countries, for developing their individual ambitions. We have grown in population from five and a half millions in 1800 to nearly one hundred and seven millions in 1921.

In the last fifty years, also, the numbers of our various species of domestic animals have practically doubled. It can readily be seen, therefore, that we must greatly increase our per acre yields by means of better cultivation, the use of increasing amounts of fertilizer, and a proper system of crop rotation, if we are to maintain the proportional increase in our population.

Livestock has consumed 75 per cent of our grain crops in addition to the great amount of roughage and hay which has been produced. We have been a vigorous, progressive, meat-eating people. We want to remain so. In fact, the future prosperity and even safety of our country depends very largely upon an efficient agricultural production, well balanced with livestock. How to bring about an increased acre yield to take care of our livestock in addition to the demand for human food has been one of the urgent problems of our agricultural leaders. It is certain that we do not want to wait till economic pressure itself forces the issue.

How the Clubs Began

Some few years previous to the world war, an idea originated in the extension departments of the United States Department of Agriculture and the state agricultural colleges, which it was felt would be a very large contributing factor in bringing about the efficiency desired. This work, which was started in the southern states and which since has rapidly spread over the entire nation, is known as boys' and girls' club work. It is nothing more nor less than a demonstration on a small scale by the boys and girls themselves of the better practices in agriculture and home economics. This work is supervised by specialists at the agricultural colleges, the U. S. Department of Agriculture co-operating; and is in turn carried on in the counties by either county

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Fertility is Basis of Profits

COMPARE the management of your soil to the management of your orchard, your dairy herd or any other part of your farming operations. An orchard may be kept alive and made to produce fruit without spraying, but all orchardists agree that spraying brings better profits. A dairy cow will produce milk when fed on shock corn, but she will make a far better record if fed on silage, clover, hay, cottonseed meal and some other concentrate in connection with corn. Likewise, you can grow a crop without fertilizer, but experience proves that the use of commercial fertilizers will return increased yields of better quality and earlier maturity.

The basis of all profitable agriculture is fertility. The experience of farmers in general in the New England, Eastern, Southern, as well as the Middle West states, proves that the judicious use of commercial fertilizers is the key to rational, business-like, profitable farming. The gigantic feats in producing food from the soil accomplished by the embattled nations of Europe became possible solely because they have learned to appreciate and understand the value of available plant food. History again confirms the statement that available plant food, along with proper soil tillage, is fundamental and brings the largest farm profits.

Cotton as a Money Crop

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This crop paid better than any crop I ever made. It paid the largest dividend on all investments combined, and in addition was a triumph over Nature in a very interesting way. All farmers could not expect to grow such large crops, but I think every one can increase the yields and with the greatest profit. It costs as much to cultivate an acre of good cotton as to cultivate an acre of the poorest, and it certainly would be wrong to have poor yielding crops where it is possible to make high yields. I am inclined to think that the yield per acre is the best index of what a farmer should charge against his time, as salary or wages. A farmer that produces 50 bushels of corn or a bale of cotton per acre should be credited with twice as much salary as one who grows only 25 bushels of corn or a half bale of cotton—granting, of course, that the same general conditions prevail in all cases.

Club Work in Modern Agriculture

Continued from page 45

agents or county club leaders. In addition to the government extension forces, the work has received the approval and aid of practically every farm paper, breed association, county, state, interstate, national and international fair or exposition, chambers of commerce, bankers, and many of the industries, particularly the packing and fertilizer industries, which depend either directly or indirectly upon the agricultural progress for their own prosperity and growth.

What the Clubs Have Done

That the boys' and girls' club work has been successful can not be denied. Sums running into the thousands of dollars have been given by the interests mentioned above toward its support. The reason for this interest is because of the excellent results which are being obtained. A yield on a boys' club acre of 100 bushels or more of corn by means of proper tillage, fertilization and care is not uncommon. In the fifteen southern states an average yield of 57 bushels of corn on all plots under club boys' and girls' supervision was obtained, whereas the average yield for the same fifteen states is only 22.6 bushels.

What is true of crop production is also true of the progress which has been made in the feeding and breeding of all classes of livestock and poultry, and the betterment of living conditions on the farm. One instance of increased crop production, a work which was carried on with the co-operation of the Armour Fertilizer Works, is especially noteworthy. This demonstration took place in certain potato producing counties of Wisconsin, in co-operation with the State Club leader. Here wonderful results in increased yields of potatoes were obtained by the use of fertilizer and by proper tillage, many of the boys doubling the ordinary yields by this means.

National Committee Organized

Because of the uniform interest which has been taken by all business related to agriculture and not directly connected with the United States extension forces, a committee was recently formed to co-ordinate the efforts along this line and to emphasize the club idea in all sections of the United States and its possessions. This committee is known as the National Committee on Boys' and Girls' Club Work, and, as stated, its efforts will be directed to the extension of the club idea to every branch of agriculture and to every rural community in the United States.

December

1st to 10th—Mild period. Fine weather in southwestern and southern sections. Much mist and fog over Great Lakes and North Atlantic coast. Snow in states of upper Rocky Mountain region and northwest. Showers over Gulf border.

11th to 20th—Falling temperature at most points east and west. Temperature 5 above zero at Denver, 8 above at St. Louis, 10 above at Cincinnati, 8 at Cumberland and 10 at Washington. Fair and cold in southern and central sections.

21st to 31st—General storm period. Much wind and bluster general with snow and sleet at nearly all points. Heavy gales over Great Lakes.

The temperature will be below normal. The precipitation will also be below the average at most points.

Moon's Phases — Eastern Time

	D.	H.	M.
Full Moon	4	6	24 M.
Last Quarter	11	11	41 M.
New Moon	18	7	20 M.
First Quarter	26	0	53 M.

D. M.	D. W.	Historical Events	Moon's Signs	Latitude of NORTHERN STATES			Latitude of MIDDLE STATES			Latitude of SOUTHERN STATES			Dec.	Gestation Table			
				Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.	Sun rises H.M.	Sun sets H.M.	Moon r. & s. H.M.		Mare	Cow	Sow	Ewe
1	F	2d Nat. Ind. Conf. meets, 1919	♑	7 8	4 29	4 9	7 3	4 34	4 6	6 44	4 54	3 57	1	Oct 29	Sept 9	Mar 22	Apr 30
2	S	Meat prices fall, 1920	♑	7 9	4 29	5 8	7 4	4 34	5 5	6 44	4 54	4 52	2	30	10	23	May 1
3	S	Advent Sunday		7 10	4 28	6 8	7 5	4 33	6 4	6 45	4 54	5 48	3	31	11	24	2
4	M	Pres. Wilson sailed for Fr., 1918	♒	7 11	4 28	rises	7 6	4 33	rises	6 46	4 54	rises	4	Nov 1	12	25	3
5	T	Francis Stetson, lawyer, d., 1920	♒	7 13	4 28	5 50	7 7	4 33	5 56	6 47	4 54	6 15	5	2	13	26	4
6	W	St. Nicholas	♓	7 14	4 28	6 46	7 8	4 33	6 52	6 48	4 54	7 11	6	3	14	27	5
7	T	Wilson sends last message, 1920	♓	7 15	4 28	7 47	7 9	4 33	7 51	6 49	4 54	8 9	7	4	15	28	6
8	F	Kg. Oscar of Swed., died, 1907	♈	7 16	4 28	8 52	7 10	4 33	8 55	6 49	4 54	9 10	8	5	16	29	7
9	S	Battle of Great Bridge, 1775	♈	7 17	4 28	10 0	7 11	4 33	10 3	6 50	4 54	10 13	9	6	17	30	8
10	S	Second Sunday in Advent	♉	7 17	4 28	11 10	7 12	4 33	11 11	6 51	4 54	11 18	10	7	18	31	9
11	M	Indiana a State, 1816	♉	7 18	4 28	morn	7 13	4 33	morn	6 52	4 54	morn	11	8	19	Apr 1	10
12	T	Cork, Ireland, burned, 1920	♊	7 19	4 28	0 22	7 14	4 33	0 22	6 52	4 55	0 23	12	9	20	2	11
13	W	New Zealand disc., 1751	♊	7 20	4 28	1 29	7 15	4 33	1 27	6 53	4 55	1 25	13	10	21	3	12
14	T	Pres. of Portugal Slain, 1918	♋	7 21	4 28	2 42	7 15	4 33	2 40	6 54	4 55	2 32	14	11	22	4	13
15	F	New Polish Cabinet, 1919	♋	7 22	4 28	3 55	7 16	4 34	3 51	6 54	4 55	3 40	15	12	23	5	14
16	S	Colo. becomes "bone dry," 1916	♋	7 22	4 29	5 5	7 17	4 34	5 1	6 55	4 56	4 46	16	13	24	6	15
17	S	Third Sunday in Advent	♌	7 23	4 29	6 13	7 18	4 34	6 9	6 56	4 56	5 51	17	14	25	7	16
18	M	Lt. "Pat" O'Brian, suicide, 1920	♌	7 24	4 29	sets	7 18	4 34	sets	6 56	4 57	sets	18	15	26	8	17
19	T	Rome burnt, 69, A.D.	♍	7 25	4 29	5 57	7 19	4 35	6 2	6 57	4 57	6 21	19	16	27	9	18
20	W	Ember Day	♍	7 25	4 30	6 59	7 20	4 35	7 3	6 58	4 57	7 20	20	17	28	10	19
21	T	St. Thomas	♎	7 26	4 30	7 59	7 20	4 36	8 3	6 58	4 58	8 17	21	18	29	11	20
22	F	Ember Day. Winter begins	♎	7 26	4 31	9 1	7 21	4 36	9 5	6 59	4 58	9 15	22	19	30	12	21
23	S	Ember Day	♏	7 27	4 31	10 3	7 21	4 37	10 5	6 59	4 59	10 13	23	20	Oct 1	13	22
24	S	Fourth Sunday in Advent	♏	7 27	4 32	11 2	7 22	4 37	11 4	7 0	4 59	11 7	24	21	2	14	23
25	M	Christmas Day	♏	7 27	4 32	11 59	7 22	4 38	11 59	7 0	5 0	11 59	25	22	3	15	24
26	T	St. Stephen	♐	7 28	4 33	morn	7 22	4 38	morn	7 0	5 0	morn	26	23	4	16	25
27	W	St. John, Evangelist	♐	7 28	4 34	0 57	7 23	4 39	0 55	7 1	5 1	0 51	27	24	5	17	26
28	T	Innocents	♐	7 29	4 34	1 56	7 23	4 40	1 54	7 1	5 1	1 47	28	25	6	18	27
29	F	Gen. R. H. Hall, died, 1914	♑	7 29	4 35	2 55	7 24	4 40	2 52	7 2	5 2	2 41	29	26	7	19	28
30	S	R. Adm. Billings, died, 1920	♑	7 29	4 36	3 53	7 24	4 41	3 50	7 2	5 3	3 35	30	27	8	20	29
31	S	First Sunday after Christmas	♑	7 29	4 36	4 53	7 24	4 42	4 49	7 2	5 4	4 31	31	28	9	21	30

Pedigree Register Associations

THE following compilation of pedigree registers maintained in the United States for purebred stock has been revised with much care and is believed to be correct. Several changes in names of secretaries and locations of officers have been made since its last publication. All inquiries concerning rules of registration and pedigrees of animals of these various breeds should be directed to the secretaries.

CATTLE REGISTERS

American Aberdeen-Angus Breeders' Association
Chas. Gray, Stock Yards, Chicago, Secretary.
American Devon Cattle Club—
Mrs. L. P. Sisson, Charlottesville, Va., Secretary.
American Galloway Breeders' Association—
R. W. Brown, Carrollton, Mo., Secretary.
American Guernsey Cattle Club—
W. H. Caldwell, Peterboro, N. H., Secretary.
American Hereford Cattle Breeders' Association—
R. J. Kinser, Kansas City, Mo., Secretary.
American Jersey Cattle Club—
R. M. Gow, 324 W. 23rd St., New York, Secretary.
American Kerry & Dexter Cattle Club—
C. S. Plumb, Columbus, O., Secretary.
American Polled Hereford Breeders' Association—
B. O. Gammon, Des Moines, Ia., Secretary.
American Shorthorn Breeders' Association—
F. W. Harding, Stock Yards, Chicago, Secretary.
Ayrshire Breeders' Association—
C. L. Burlingham, Brandon, Vt., Secretary.
Breeders' Association of French-Canadian Cattle of the United States—W. J. McMurdy, Binghamton, N.Y., Secy.
Brown Swiss Cattle Breeders' Association—
Ira Inman, Beloit, Wis., Secretary.
Dutch Belted Cattle Association of America—
E. J. Kirby, Covert, Mich., Secretary.
Holstein-Friesian Association of America—
F. L. Houghton, Brattleboro, Vt., Secretary.
American Polled Shorthorn Breeders' Association—
J. H. Marts, Greenville, O., Secretary.
Red Polled Cattle Club of America—
Harley A. Martin, Richland Center, Wis., Secretary.

SHEEP AND GOAT REGISTERS

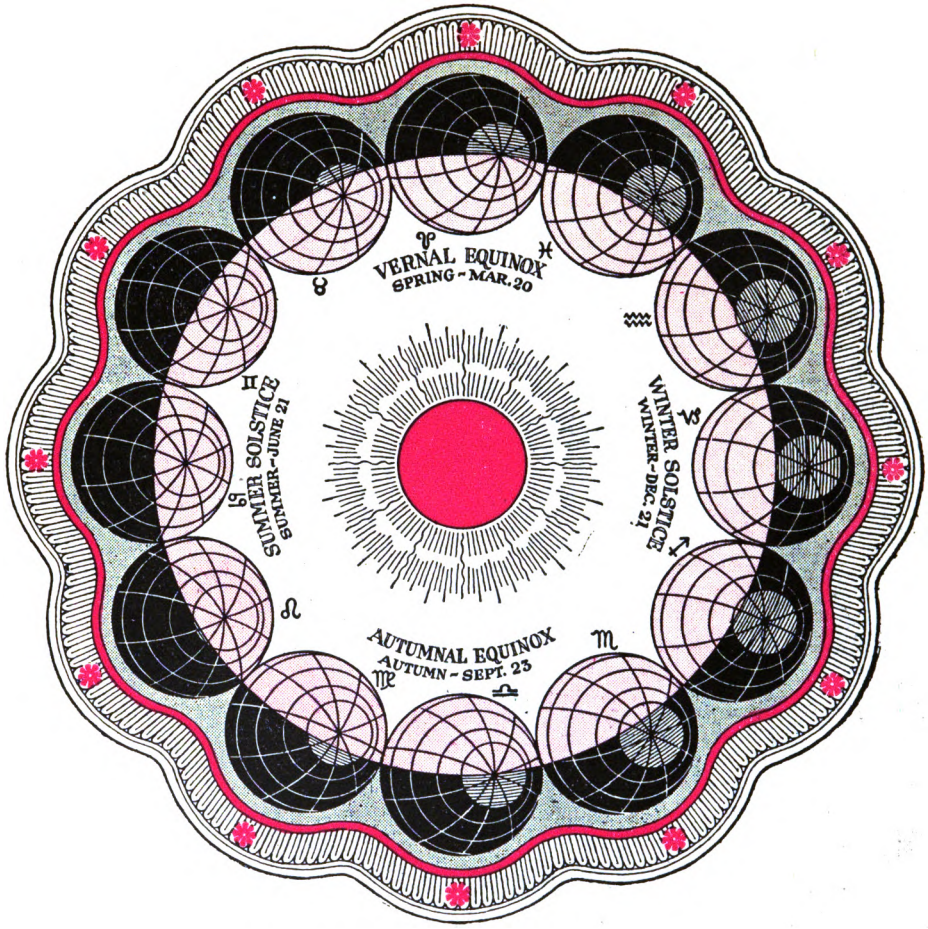
American Angora Goat Breeders' Association—
C. E. DeGraff, Reed Springs, Mo., Secretary.
American Black-Faced Highland Sheep Association
F. R. Sanders, Mesa, Ariz., Secretary.
American Cheviot Sheep Society—
E. A. Stanford, Secretary, Cooperstown, N.Y.
American Cotswold Association—
F. W. Harding, Union Stock Yards, Chicago, Ill., Secy.
American and Delaine Merino Record Association—
Gowdy Williamson, Xenia, Ohio, Secretary.
American Hampshire Sheep Association—
C. A. Tyler, 36 Woodland Ave., Detroit, Mich.
American Leicester Breeders' Association—
A. J. Temple, Cameron, Ill., Secretary.
American Milch Goat Record Association—
J. C. Darst, Dayton, O., Secretary.
American Oxford Down Association—
W. A. Shafor, Hamilton, O., Secretary.
American Rambouillet Sheep Breeders' Association—
Dwight Lincoln, Marysville, O., Secretary.
American Romney Sheep Breeders' Association—
Mark Havenhill, 703 Rose St., Lexington, Ky., Secretary.
American Shropshire Registry Association—
Julia M. Wade, Lafayette, Ind., Secretary.
American Southdown Breeders' Association—
Frank S. Springer, Springfield, Ill., Secretary.
American Suffolk Flock Registry Association—
James Bowman, Guelph, Ont., Secretary.
American Tunis Sheep Breeders' Association—
G. C. Kreglow, DeGraff, O., Secretary.
Black Top Spanish Merino Sheep Breeders' Publishing Association—R. P. Barry, Clokey, Pa., Secretary.
Continental Dorset Club—
Miss Edith Chidester, Mechanicsburg, O., Secretary.
Dickinson Record Co.—
Mrs. Beulah Miller, New Berlin, O., Secretary.
Dorset Horn Breeders' Association of America—
M. A. Cooper, Washington, Pa., Secretary.
Improved Black-Top Delaine Merino Sheep Breeders' Association—O. M. Robertson, Eaton Rapids, Mich., Secy.
National Lincoln Sheep Breeders' Association—
Bert Smith, Charlotte, Mich., Secretary.
National Merino Sheep Register Association—
R. O. Logan, Montgomery, Mich., Secretary.
Persian Sheep Breeders' Association—
C. E. Bailey, San Jose, Cal., Secretary.
Standard Delaine Merino Sheep Breeders' Association—
R. M. Wood, Saline, Mich., Secretary.

SWINE REGISTERS

American Berkshire Association—
Frank S. Springer, Springfield, Ill., Secretary.
Kentucky Red Berkshire Association—
W. O. Walker, Stanford, Ky., Secretary.
American Duroc-Jersey Swine Breeders' Association—
R. J. Evans, Stock Yards, Chicago, Secretary.
American Hampshire Swine Record Association—
E. C. Stone, Peoria, Ill., Secretary.
American Large Black Pig Society—
J. F. Cook, Lexington, Ky., Secretary.
American Poland-China Association—
W. M. McFadden, Transportation Bldg., Chicago, Secy.
American Tamworth Swine Record Association—
E. N. Ball, Hamburg, Mich., Secretary.
American Yorkshire Club—
H. G. Krum, White Bear Lake, Minn., Secretary.
Cheshire Swine Breeders' Association—
E. S. Hill, Freeville, N. Y., Secretary.
Chester White Record Association—
F. F. Moore, Rochester, Ind., Secretary.
Improved Small Yorkshire Club of America—
F. B. Stewart, Espyville, Pa., Secretary.
National Chester White Record Association—
Thos. Sharpless, West Chester, Pa., Secretary.
National Duroc-Jersey Swine Breeders' Association—
J. R. Pfander, Peoria, Ill., Secretary.
National Mulefoot Hog Record Association—
G. C. Kreglow, DeGraff, O., Secretary.
American Mulefoot Hog Record Association—
E. E. Pfeiffer, 1105 Wyandotte Bldg., Columbus, O., Secy.
National Poland-China Record Association—
A. M. Brown, Winchester, Ind., Secretary.
National Spotted Poland-China Record Association—
Fred L. Obenchain, Bainbridge, Ind., Secretary.
O. I. C. Swine Breeders' Association—
O. C. Vernon, Goshen, Ind., Secretary.
Standard Poland-China Record Co.—
Frank L. Garrett, Maryville, Mo., Secretary.
United States Small Yorkshire Association—
D. T. Bascom, R. F. D., Montgomery, Mich.

Following is a list of some of the associations representing the more popular breeds of poultry:

United Ancona Club—
R. W. VanHoesen, Franklinville, N. Y., Secretary.
Blue Andalusian Club of America—
Walter G. Coates, East Calais, Vt., Secretary.
American Light Brahma Club—
Harvey C. Wood, Bound Brook, N. J., Secretary.
American Cornish Club—
Fred H. Bohrer, Utica, N. Y., Secretary.
American Houdan Club—
Miss Nora Ryan, Penn Yan, N. Y., Secretary.
American Java Association—
W. G. Morton, 130 State St., Albany, N. Y., Secretary.
American Leghorn Club—
M. L. Keasling, Bel Air, Md., Secretary.
S. C. Brown, Leghorn Club—
G. S. Korell, 112 Gason, Columbus, O., Secretary.
National S. C. White Leghorn Club—
Robert K. Kyle, Bourbon, Ind., Secretary.
International S. C. Black Minorca Club—Junius Johnson, 6001 Harrison Road, Kansas City, Mo., Secretary.
National S. C. Buff Orpington Club—
A. C. Andrews, Miller, Neb., Secretary.
Rhode Island Red Club of America—
W. H. Card, Manchester, Conn., Secretary.
American Barred Plymouth Rock Club—
F. G. Cook, Waltham, Mass., Secretary.
American White Plymouth Rock Club—
Wm. A. Halbach, Waterford, Wis., Secretary.
National Bronze Turkey Club—
Chas. E. Bird, Meyersdale, Pa., Secretary and Treasurer.
Silver Wyandotte Club of America—
Carl H. Sommer, Rush City, Minn., Secretary.



CHURCH DAYS, 1922

Epiphany	January 6	Easter Sunday	April 16
Septuagesima Sunday	February 12	Low Sunday	April 23
Sexagesima Sunday	February 19	Rogation Sunday	May 21
Quinquagesima Sunday	February 26	Ascension Day	May 25
Shrove Tuesday	February 28	Whit Sunday	June 4
Ash Wednesday	March 1	Trinity Sunday	June 11
Quadragesima Sunday	March 5	Corpus Christi	June 15
Palm Sunday	April 9	Advent Sunday	December 3
Good Friday	April 14	Christmas Day	December 25

EMBER DAYS, 1922

March 8, 10 and 11. June 7, 9 and 10. September 20, 22 and 23. December 20, 22 and 23.

SEASONS FOR 1922 — Eastern Standard Time

☉ enters ♈, Spring begins	March 21 d. 4 h. 49 m. Morn.
☉ enters ♋, Summer begins	June 22 d. 0 h. 27 m. Morn.
☉ enters ♎, Autumn begins	September 23 d. 3 h. 10 m. Eve.
☉ enters ♑, Winter begins	December 22 d. 9 h. 57 m. Morn.

ECLIPSES FOR 1922

In the year 1922 there will be two Eclipses, both of the Sun.

I.—An Annular Eclipse of the Sun, March 28th, invisible here. Visible to South America, greater part of Europe and Africa, and to a large portion of the central Atlantic Ocean.

II.—A Total Eclipse of the Sun, September 20th, invisible here. Visible to the Indian Ocean, Australia, New Zealand and adjacent portions of the Pacific Ocean.