

● 37  
Collection

EXPERIMENT STATION  
LIBRARY

Oklahoma Agricultural Experiment Station.

---

BULLETIN NO. 47.

---

SEPTEMBER, 1900.

---

REPORTS OF WHEAT RAISERS,  
JOHN FIELDS.

---

EXPERIMENTS WITH WHEAT,  
F. C. BURTIS.  
J. G. KERR.

---

BULLETINS OF THIS STATION ARE SENT FREE TO RESIDENTS  
OF THE TERRITORY ON REQUEST.

---

STILLWATER, OKLAHOMA.

# Oklahoma Agricultural and Mechanical College, Agricultural Experiment Station.

---

## BOARD OF REGENTS,

HON. C. M. BARNES, GOVERNOR, ex-officio,	- - - -	GUTHRIE
HON. F. J. WIKOFF, PRESIDENT,	- - - -	STILLWATER
HON. C. J. BENSON, TREASURER,	- - - -	SHAWNEE
HON. J. C. TOUSLEY,	- - - -	WEATHERFORD
HON. J. P. GANDY,	- - - -	ALVA
HON. W. E. BOLTON,	- - - -	WOODWARD

---

A. C. SCOTT, A. M., L. L. M., - - - - - President of the College

---

## STATION STAFF.

JOHN FIELDS, B. S.....	Director and Chemist.
L. L. LEWIS, M. S., D. V. M.....	Veterinarian
F. C. BURTIS, M. S.....	Agriculturist
E. M. WILCOX, Ph. D.....	Botanist and Entomologist
O. M. MORRIS, B. S.....	Associate Horticulturist
J. G. KERR, B. S., .....	Assistant in Agriculture
H. M. HAND.....	Clerk
MISS G. M. HOLT.....	Stenographer

---

VISITORS ARE CORDIALLY WELCOMED AT ALL TIMES.

The publications of the station are sent free to residents of the territory on request. All communications should be addressed, not to individuals or departments, but to the

EXPERIMENT STATION,  
Stillwater, Oklahoma.

## REPORTS OF WHEAT RAISERS.

JOHN FIELDS.

Through the kindness of the millers of the territory, the station secured the names of several successful wheat growers in each county who have furnished a statement of the methods which they follow on a large scale and the results which they have secured. These reports have been arranged alphabetically by counties so that the results in a given district may be examined without difficulty. They are believed to represent the average results obtained in actual practice and are worthy of careful study.

The reports cover a wide range of soil and climatic conditions and their uniformity is but another proof that good methods of farming will bring success in every part of Oklahoma. The chief points of uniformity of practice are:

1. Plow early and deep and work the soil well before seeding.
2. Complete the seeding before October 15.
3. Hard wheats as a rule are preferred in the western counties and on the uplands. Soft wheats are grown in the eastern counties
4. Rotation is generally preferred to continuous culture of wheat, and the beneficial effect of manure is mentioned in many cases.

Losses from insect ravages have been slight but rust has been troublesome, especially on late wheat. The grain louse which attracted attention early in the season is mentioned as probably having caused loss in only one case. Grading up of seed wheat by using the fanning mill is recommended as profitable.

The majority of wheat raisers reporting pasture wheat when the conditions are suitable and find it profitable. Early

sown wheat that is growing vigorously is said to be benefited by proper pasturing and the advantage of the succulent feed during the winter is large.

The following list of questions was sent out and replies were received from one hundred and eighteen farmers representing eighteen counties. In the summary of replies, the figures are used to indicate the questions.

REPORTS ON WHEAT.

1. How long have you been growing wheat in Oklahoma?
2. What varieties have you grown?
3. What varieties do you consider best for your locality?
4. What has been your acreage in wheat and average yield?
5. Do the results of your experience favor early or late plowing?
6. Do the results of your experience favor early or late seeding?
7. Do the results of your experience favor pasturing?
8. What amount of seed do you sow per acre?
9. What has been the result of manuring wheat ground?
10. Do you grow wheat continuously on the same land?
11. Do you regard continuous wheat growing on the same land desirable?
12. Have you been troubled with rust, smut, Hessian fly or chinch bugs?
13. General remarks.

BLAINE.

*Rev. J. S. Krehbiel.*—

- 1, Since 1892. 2, Have raised Turkey wheat exclusively.
- 3, Think hard wheat best for our country, because mills are only arranged for hard wheat. 4, From 40 to 150 acres; average would likely be about 15 bu. per acre. 5, Early. 6, Last week in September and first in October prove best. 7, Good if not carried to excess. 8, One bu. if sown in September and October, if later, then increase to one and a quarter. 9, Results better in second year, too much straw the first. 10, No. Change from time to time. 11, No. 12, Had rust in '98 and '99 in some late wheat.

*John Pinkerton.*—

1. Three years, 3, Turkey wheat is my choice. 4, On old

ground, about 20 bu. 5, From September 20 to October 1. 6, Early. 7, Pasturing is all right if stock are kept off when ground is wet. 8, One bu. 10, No. 11, No. 12, Only rust in '98.

*F. Ringleman.*—

1, Five years. 2, Turkey wheat is about all that is grown in this locality. 4, Two hundred acres, fifteen bushels. 5, Early, July if possible. 5, From September 15 to October 1. 7, Yes. 8, One bu. 10, Yes. 11, No. 12, Not this year.

*H. Schmutz.*—

1, Since 1893. 2, Only Turkey. 4, Fifty-five acres, fourteen bu. 5, Early plowing. 6, Between the 1st and 15th of October. 7, Light pasturing in dry weather will do no harm. 8, One bu. 10, In part. 11, Changing is better. 12, In '98 and '99, wheat was hurt by rust.

*Eli B. Sisney.*—

1, Six years. 2, Nothing but Turkey wheat. 4, About one hundred acres twenty bu. 5, Early. 6, Early. 7, No pasture as a rule. 8, Three fourths to one bu. 9, Manured land grows too much straw, not as good. 10, Yes. 11, No. 12, Some rust on late sowing. 13, My wheat this year averaged twenty-five bu., some on early plowing made thirty-five bu.

#### CANADIAN.

*J. W. Botts.*—

1, Seven years. 2, Have not tried soft wheat, always grow hard wheat. 4, From twelve to twenty bu. per acre. 5, Early. 6, Early. 7, Yes. 8, Three pecks. 10, Yes. 11, No. 12, Have been troubled with rust two years.

*W. E. Cecil.*—

1, Nine years. 2, Mediterranean and Turkey. 4, From two to four hundred acres, average about eighteen bu. 5, Early. 6, Early. 7, Fall and winter not harmful, late spring is. 8, One bu. 9, Good results from manure. 10, Yes. 11, No difference. 12, Rust to some extent.

*Geo. W. Dixon.*—

1, Nine years. 2 Both hard and soft. 3, Consider hard the surest and best. 4, One hundred and twenty acres, eighteen bu. 5, Early. 6, Early. 7, Moderate pasturing. 8, One bu.

10, Yes. 11, No. 12, Black rust. 13, Think we should get new seed of a hard variety from some of the states.

*W. P. Deardorff*,—

1, Ten years. 2, Turkey, May, and Mediterranean. 3, Mediterranean. 4, One hundred and seventy acres, eighteen bu. 5, Early. 6, Early. 7, Yes. 8, One bu. 10, Yes. 11, No. 12, Rust in '98 and '99. 13, I think it is very necessary that the ground be plowed early.

*V. P. DuVall*,—

1, Six years. 2, Fulcaster, White Russian, and White Mediterranean. 3, White Russian or Turkey. 4, One hundred and fifty to two hundred acres; about 15 bu. 5, Early. 6, About the 20th of September. 7, Light pasturing does no harm. 8, One bu. 9, Good results from manuring. 10, Yes. 11, No. 12, With all except Hessian fly.

*H. F. Grossman*,—

1, Eight years. 2, White Mediterranean and May. Shrivelled badly. 3, The hard wheat seems to do the best on the average. 4, Three hundred acres, about sixteen bu. 5, Early. 6, From September 25 to October 15. 7, Not too heavy and not later than March 15. 8, One bu. 9, Manuring light after wheat is sowed has given best results. 10, Yes. 11, No. 12, Have had rust on late wheat, smut on soft wheat, no fly or chinch bugs. 13, I think farmers will have to change their wheat land or let it lie idle a year once in a while.

*E. Huls*,—

1, Ten years. 2, Fultz and Turkey. 3, Turkey. 4, Fifty acres, twenty bushels. 5, Early. 6, Early, September 20. 7, Not much. 8, One bushel of clean seed. 10, In part. 11, For a limited time. 12, With rust; smut only on Fultz; chinch bugs; grasshoppers in fall. 13, Deep plowing, six to eight inches is best; discing a failure.

*G. W. Keneaster*,—

1, Seven years. 2, Turkey and soft wheat. No success with latter. 4, One hundred fifty acres, sixteen bushels. 5, Early. 6, Early and late, dodge the middle season. 7, Up to March is good for it. 8, Three pecks for early, one bu. for late

sowing. 9, Bad. 10, Yes. 11, Yes. 12, Rust twice, grasshoppers very bad last fall.

*O. E. Lacy,—*

1, Eight years 2, Red Mediterranean, Fultz, Fulcaster and Turkey. 3, Red Mediterranean and Turkey. 4, About one hundred acres, twelve bushels. 5, Early. 6, Moderately early. 7, All right at the proper time. 8, One bushel, early. 10, Yes. 11, No. 12, Smut and rust on Fultz. 13, Red Mediterranean is the best soft wheat. Rust has affected it during the last two years. In dry years, it beats Turkey five bu. per acre with an advance in price of two to five cents per bu.

*J. E. Line,—*

1, Nine years. 2, Turkey, soft Mediterranean and Fultz. 3, Turkey is best for all kinds of weather. 4, About twenty-five bushels per acre. 5, Early. 6, Early. 7, Moderate pasturing. 8, Three pecks to one bushel per acre. 10, Yes. 11, No. 12, Have been troubled some with rust.

*Jos. H. McGee,—*

1, Ten years. 2, Turkey, Fulcaster, and Red Mediterranean. 3, Turkey. 4, From one hundred to three hundred and fifty acres per year. 5, Early. 6, About the first of October. 7, Not later than the first of March. 8, One bushel. 9, Sometimes it does not do well to manure too heavy. 10, Yes, for ten years. 11, No. 12, Was troubled with rust one year only. 13, My average yield has been about eighteen bushels per acre.

*J. A. McMahan,—*

1, Nine years. 3, Mediterranean and Turkey are the surest crop. 4, One hundred to one hundred and fifty acres, about twenty bushels. 5, Early. 6, Early. 7, Light if any. 8, One bushel. 9, Light manuring is good, heavy makes the wheat fall. 10, Change every three or four years. 11, No. 12, We have been troubled with rust.

*B. G. Penick,—*

1, Seven years. 3, Turkey. 4, Seventy-five acres, twenty bushels. 5, Early. 6, Early. 7, Have pastured every year. 8, Three pecks. 10, Yes. 11, Yes. 12, Have never been troubled with any of them. 13, I believe in leaving all of the straw that is possible on the land and in plowing early.

*Ridge Whitlock,—*

1, Eight years. 3, Hard varieties. 4, One hundred acres, eighteen bushels. 5, Early. 6, Early. 7, No. 8, One bushel. 9, I think the land better for wheat without manure while it is new. 10, Yes. 11, No. 12, Had black rust two years ago. No fly. Have chinch bugs every year, don't think they hurt the wheat but damage corn badly. 13, If the land is in condition to be plowed, think it is best to plow in July and sow with disk drill from the first to the fifteenth of October.

*John Worthington,—*

1, Nine years. 2, May, Fultz, Fulcaster, Red Cross, and Turkey. 3, Last two proved best. 4, Twenty bushels per acre. 5, Early and deep. 6, Early. 7, Not pasture heavy. 8, One bu. 10 Yes. 11, Yes. 12, No.

CLEVELAND.

*E. E. Alkire,—*

1, Seven years. 3, Fulcaster. 4, Twenty to thirty acres. 5, Early. 6, Early. 7, Yes. 8, One and one-fourth bu. 10, Four years. 11, Yes. 12, With rust and chinch bugs.

*W. E. Bain,—*

1, Nine years. 2, Fultz and Fulcaster. 3, Fulcaster. 4, Forty acres, twenty-five bushels. 5, Early. 6, Early. 7, I always pasture wheat. 8, One bu. 10, No. 11, No. 12, Have been troubled some with rust.

*P. J. Brown,—*

1, Seven years. 3, Fulcaster. 4, From fifteen to fifty acres, seventeen to thirty bushels with one failure. 5, Early. 6, Medium. 7, Does not seem to hurt if not kept up too late. 8, One and one-fourth bu. 9, Heavy manuring makes too much straw. 10, No. 11, Not on my land. 12, With chinch bugs, some rust on late wheat, no fly.

*J. B. Cummings,—*

1, Two years. 3, Fulcaster. 4, Fifty-five acres, twenty bushels. 5, Early. 6, Early. 7, Depends on the season. 8, One and one-fourth bu. 10, Yes, so far. 11, No. 12, Some rust.

*W. F. Essex,—*

1, Ten years. 2, Mediterranean and Fulcaster. 3, Fulcaster. 4, One hundred and fifty acres, twenty-two bushels. 5,



In July. 6, September 1st. 7, I always pasture heavy. 8, One and one-half bu. 10, Yes. 11, Yes. 12, Very little. 13, I consider it pays to pasture wheat, especially if a man has his own stock. I would not take in stock to pasture wheat.

*L. Faubion,—*

1, Six years. 3, Fulcaster. 4, Fifty to seventy-five acres, twenty to thirty bushels. 5, Early. 6, From September 15th to October 5th. 7, I pasture freely until March 1. 8, Two and one-fourth bu. 10, Oats, then wheat. 12, Chinch bugs once, rust frequently. 13, I know of no other wheat but Fulcaster in this locality.

*J. P. N. Haun,—*

1, Five years. 3, Mediterranean and Fultz. 4, Twenty bushels per acre. 5, Early in July. 6, In September. 7, At any time when ground is dry. 8, One and one-half bu. 10, Have for four years. 11, No. 12, Some rust and chinch bugs, no fly

*Roland Hughes,—*

1, Five years. 2, Mediterranean and Fulcaster. 3, Fulcaster. 4, Forty-three acres, eighteen bushels. 5, Early. 6, September 20th to 30th. 7, No. 8, One and one-fourth bu. 10, I have for four years. 11, No. 12, Some smut and chinch bugs, no fly.

*Ed. P. Ingle,—*

1, Nine years. 2, Mediterranean, Early May, and Fulcaster. 3, Fulcaster. 4, Seventy-five acres, eighteen bushels. 5, Early, July if possible. 6, Early, September if possible. 8, No. 10, Yes. 11, No. 12, Chinch bugs in '92 only. 13, Fulcaster leads in this section, fully ninety per cent of wheat grown being of that variety. Bearded wheat does best in every respect. Continuous wheat growing is causing shorter heads and weak straw. We consider cotton a good crop to restore our lands, especially the uplands which is the character of the land here reported. The upland of southern Oklahoma is underlaid with a very hard sub-soil. This soil, however, when plowed up deep has made good yields of wheat. Heavy manuring has not proven a success here causing too rank straw and, in nearly every instance, late maturing and rust. Hard wheat, "Turkey Red," has given poor yields and there is but little

sown here. The yield for 1900 is not coming up to expectations, falling fully twenty per cent short—from fifteen to twenty-eight bushels per acre where thrashed. The acreage was increased by about twenty per cent and will be still further increased for the crop of 1901.

*L. E. Leach*,—

1, Eight years. 3, Fulcaster. 4, One hundred and seventy-five acres, fifteen bushels. 5, Early. 6, Middle of September. 7, Not as good. 8, One to one and one-fourth bu. 10, Yes. 11, No. 12, Some excepting Hessian fly.

*R. E. Leach*,—

1, Five years. 2, Only Fulcaster. 4, Two hundred acres, sixteen bushels. 5, Early. 6, Early. 7, See no difference. 8, Best yield with one and one-half bu. 9, Have manured some hard spots with good results. 10, No. 11, No. 12, With rust and chinch bugs.

*Jno. S. Lindsay*,—

1, Two years. 3, Fulcaster. 4, Seventy-five acres, twenty-three bushels. 5, Early. 6, From fifteenth to twenty-fifth of September. 7, Very little. 8, One and one-fourth bu. 10, Yes. 11, No. 12, No.

*John L. Long*,—

1, Six years. 3, Fulcaster. 4, Seventy acres, eighteen bushels. 5, Early. 6, In September. 7, All right until middle of February. 8, One and one-fourth bu. 10, In part. 11, No. 12, With rust and a few chinch bugs.

*A. O. McGill*,—

1, Ten years. 2, May, Fultz, and Fulcaster. 3, Fulcaster. 4, Twenty-two bushels. 5, Very early. 6, Early. 7, Doesn't hurt if taken off in time. 8, One and one-half bu. 10, Yes. 11, No. 12, Rust and bugs formerly, none for five years. 13, Always use press drill.

*Mannie B. Parker*,—

1, Eight years. 3, Fulcaster. 4, Seventeen bushels. 5, Early always one-half better. 6, From fifth to twentieth of September. 7, Depends on nature of land, if sandy, don't pasture. 8, One and one-half bu. 9, Good results. 10, Yes. 11,

No. 12, Nothing but a little rust. 13, Pasture tight land but not sandy, they cut it up and start it to blowing.

*W. B. Parker,*—

1, Eight years. 3, Fulcaster for all kinds of land. It sometimes happens that Fultz is best but not so sure as it will smut some years. 4, Eighty acres, sixteen and one-half bushels. 5, Early. 6, Early. 7, Moderate. 8, One and one-fourth bu. 9, Manure on fresh land causes wheat to fall and rust. 10, Yes. 11, No. 12, Have not been materially damaged. 13, My crop this year averaged twenty bushels.

*I. G. Short,*—

1, Five years. 3, Fulcaster. 4, Eighty acres, eighteen bushels. 5, Early. 6, Early. 7, Some years. 8, One and one-fourth bu. 10, Yes. 11, Yes. 12, No,

*W. T. Vowell,*—

1, Eight years. 3, Fulcaster. 4, Fifty acres, eighteen bushels. 5, Early. 6, Medium. 7, Medium. 8, One and one-fourth bu. 10, Yes. 11, Yes. 12, Not to any extent. 13, The best wheat I had this year was on my old wheat land. I pastured heavy this year and my yield was twenty bushels per acre.

*G. Westervelt,*—

1, Four years. 3, Fulcaster. 4, Fifty acres, twenty bushels. 5, Early. 6, Early. 7, No. 8, One and one-fourth bu. 9, Good. 10, Yes. 11, Yes. 12, Some smut this year. 13, I plow early and deep and seed in September.

*A. J. Wilson,*—

1, Ten years. 2, Mediterranean. 3, Turkey. 4, Twenty acres, twenty bushels. 5, Early. 6, Early. 7, Think it hurts crop but pasture is worth as much as crop. 8, One and one-fourth bu. 9, Will increase yield one-half if proper amount is used. 10, Yes. 11, No. 12, Some with chinch bugs.

#### CUSTER.

*C. M. Collins,*—

1, Eight years. 2, Red Russian. 4, About eighteen bushels. 5, Early. 6, Early. 7, Always pasture. 8, Three-fourths bushel. 10, In part. 11, No. 12, No.

*T. A. Garvin,*—

1, Six years. 2, Turkey. 3, Hard wheat. 4, Eighteen bush-

els. 5, Early. 6, About October 1. 7, Yes. 8, From one-half to three-fourths of a bushel. 10, Yes. 11, No. 12, Fly to some extent. 13, This spring about the first of April my wheat turned yellow.

*F. D. Mathis*,—

1, Eight years. 2, Fultz and Red Turkey. 3, Turkey. 4, Thirty acres, thirteen bushels. 5, Early. 6, Early. 7, Moderately. 8, Three-fourths bu. 10, Yes, and better each year. 11, Yes. 12, With rust and smut but not on early wheat.

*Wm. Thomas*,—

1, Three years. 2, Turkey. 4, About fifteen bushels. 5, Early. 6, Early. 7, No. 8, Three pecks to one bu. 10, Yes. 11, Yes. 12, Not very much.

*H. A. Winningham*.—

1, Six years. 2, Turkey and Mediterranean. 3, Mediterranean. 4, Two hundred and fifty acres, fifteen bushels. 5, Early. 6, Early. 7, Yes, if winters are warm. 8, Three pecks. 10, No. 11, No. 12, Chinch bugs in dry weather, rust in wet weather.

#### GARFIELD.

*S. E. Carrier*,—

1, Six years. 2, Golden Chaff, Red Turkey, and White Russian. 3, White Russian. 4, One hundred and ninety acres, fifteen bushels. 5, Early and deep. 6, Medium early. 7, Yes, in most seasons. 8, Three pecks. 10, Yes. 11, No. 12, We had rust in '99.

*R. E. Church*,—

1, Six years. 2, Red Turkey and White Russian. 4, Sixty acres, fifteen bushels. 5, Early. 6, Early. 7, Yes. 8, One bu. 10, No. 11, No. 12, Not to any extent.

*J. D. Corry*,—

1, Six years. 2, Turkey and May. 3, Turkey. 4, One hundred and thirty acres, fifteen bushels. 5, Early. 6, Early. 7, Light pasturing does not seem to hurt. 8, Three pecks is best. 9, Have manured a few patches with good results. 10, Yes. 11, No. 12, Very little.

*S. B. Evans,—*

1, One year. 3, Hard. 4, Twenty-five acres, twenty-five bushels. 5, Early. 6, Early. 8, One bu. 12, No.

*Fred Fromholz,—*

1, Six years. 3, I have grown soft and May wheat but Red wheat has proven better. 4, From twenty to twenty-five bushels. 5, Early plowing and harrowing. 6, In September. 7, Have always pastured. 8, Three pecks good seed. 10, Yes. 11, No. 12, No.

*John Pendergast,—*

1, Five years. 2, Turkey and May. 3, Turkey. 4, Twenty bushels. 5, Early. 6, September 15 to October 10. 7, Is a slight damage but it pays. 8, One bu. 9, Light top dressing with stable manure increased yield. 10, No. 11, No. 12, With Hessian fly.

*J. W. Phillips,—*

1, Four years. 3, Turkey. 4, Forty acres, fifteen bushels. 5, Early. 6, Early. 7, Good for the cattle but not for the wheat. 8, One bu. 9, It makes a large increase in the crop. 10, No. 11, No. 12, Some rust and chinch bugs but not to any great extent.

*Amos Stolabarger,—*

1, Three years. 2, Red Russian and Turkey. 4, Fifty acres, twenty-two bushels. 5, Early. 6, Early. 7, No. 8, One bu. 10, Yes. 11, Yes. 12, No.

GRANT.

*T. M. Adams,—*

1, Six years. 3, The hard varieties. 4, Two hundred acres. 5, Early. 6, Early. 7, No. 8, One bu. 10, Yes. 11, Yes. 12, No fly, some bugs and rust in late sowing.

*N. Beckham,—*

1, Five years. 2, Fultz, Turkey, and White Russian. 3, White Russian. 4, Seventy acres, twenty-two bushels. 5, Early. 6, Early. 7, No. 8, One and one-fourth bu. 10, Yes. 11, Yes. 12, With rust.

*J. M. Cory,—*

1, Five years. 2, Hard Turkey. 4, One hundred acres, eighteen bushels. 5, Early. 6, Early. 7, Usually all right. 8, One bu. 10, Yes. 11, Yes. 12, With rust and chinch bugs.

*B. F. Covey*,—

1, Four years. 3, White Russian and Red Turkey. 4, Eighteen bushels. 5, Early. 6, Early. 7, Always pasture when wheat is large enough. 8, One and one-fourth bu. 9, Manured three acres last year and think wheat was two bushels better on it. 10, Yes. 11, No. 12, Chinch bugs hurt my wheat three to five bushels last year.

*J. S. Dester*,—

1, Four years. 3, May wheat has never yielded as well as Turkey. 4, Sixty-five acres, twenty-eight bushels. 5, Early. 6, Early to medium. 7, No. 8, One bu. 9, Good results, would not manure too heavy. 10, Yes. 12, Very little.

*J. G. Gilliland*,—

1, Four years. 3, White Russian. 4, One hundred and forty acres, eighteen bushels. 5, Early. 6, Early, October 1. 7, Yes. 8, One bu. 10, Yes. 11, Yes. 12, Rust one year.

*Geo. Ingram*,—

1, Six years. 2, Oregon May and White Russian. 3, White Russian. 4, Seventy-five acres, twenty bushels. 5, Early. 6, Early. 7, Yes. 8, One and one-fourth bu. 10, Yes. 11, Yes. 12, In '94, '95, and '96, chinch bugs killed the wheat.

*Milton Lively*,—

1, Six years. 2, Turkey, Fultz, and White Russian. 3, White Russian. 4, One hundred and twenty-five acres, twelve bushels. 5, Early. 6, Early. 7, To some extent. 8, One bu. 9, It makes too much straw and does not fill. 10, No, corn one-fourth of the time. 11, No. 12, Rust in '98.

*J. E. Roy*,—

1, Five years. 3, Turkey. 4, Thirty-five acres, twenty-nine bushels. 5, Early. 6, Early. 7, No. 8, One bu. 10, Yes. 11, No. 12, No.

*Job Thorp*,—

1, Five years. 2, White Russian. 4, Fifty acres, twenty bushels. 5, Early. 6, October 1. 7, Yes. 8, Five pecks. 10, No. 11, No. 12, Rust and chinch bugs once.

*P. T. Walton*,—

1, Six years. 2, White Russian. 4, Two hundred acres,

twenty bushels. 5, Early. 6, Early. 7, Pasture it close. 8, Fifty pounds. 10, Change with corn. 11, No. 12, No.

## KAY.

*D. S. Greenwood*,—

1, Two years. 2, Fultz and Red Cross. 3, Early May. 4, One hundred acres, twenty one bushels. 5, Early. 6, Early. 7, No. 8, Five pecks. 10, Yes. 11, Yes. 12, With Hessian fly and chinch bugs.

*G. E. Hayden*,—

1, Six years. 2, Fultz, Turkey Red, Red Cross, and Rudy. 3, Fultz. 4, One hundred acres, nineteen bushels. 5, Early. 6, Early. 7, Yes. 8, One and one-fourth bu. 9, Manured on thin land with fifty per cent increase in yield. 10, Yes. 11, Yes. 12, Rust damaged crop thirty per cent in '99 and '00.

*Thomas McQuirk*,—

1, Three years. 2, Fultz and May. 3, May. 4, Twenty bushels. 5, Early. 6, Early. 7, Yes, if the growth is good. 8, One bu. 9, Good. 10, Yes. 11, Yes, if manured. 12, Some smut.

*H. B. Cwen*,—

1, Six years. 2, Big May, Oregon Red, and Red Russian. 4, Twenty bushels. 5, Early. 6, Early. 7, Yes. 8, One bu. 10, Yes. 11, No. 12, With chinch bugs to some extent.

*Allen Round*,—

1, Five years. 2, Fultz, Fulcaster, and hard wheat. 3, Fultz. 4, About twenty bushels. 5, Early. 6, Early. 7, I do not pasture. 8, Five pecks. 10, Yes. 11, Yes. 12, Very slightly.

## KINGFISHER.

*A. C. Aborn*,—

1, Seven years. 2, Hard and soft. 3, Hard. 4, One hundred and fifty acres, eighteen bushels. 5, Early. 6, Early. 7, Light. 8, Early sowing, three pecks, late, one bu. 9, Better yield. 10, Yes. 11, Yes. 12, Rust and freezing out of soft wheat.

*Geo. Adams*,—

1, Seven years. 2, White Russian and Turkey. 3, White Russian. 4, Two hundred acres, eighteen bushels. 5, Early.

6, Early. 7, No harm until after March 1. 8, Upland, one bu.; bottom, one and one-fourth bu. 10, Yes. 11, No. 12, With army worms two years. 13, Too dry plowing is not good for wheat.

*C. O. Brown,—*

1, Ten years. 2, White Russian. 4, Twenty-nine bushels. 5, Early, 6, Medium. 7, Yes. 8, One bu. 10, Yes. 11, No. 12, No.

*Wm. J. Brown,—*

1, Ten years. 2, Turkey, 4, Two hundred acres, twenty-seven bushels. 5, Early. 6, Early. 7, No. 8, Three pecks to one bu. 10, Yes. 12, Some rust last year on bottom land.

*J. Y. Callahan,—*

1, Seven years. 3, Red Russian and Turkey. 4, Two hundred acres, fifteen bushels. 5, Early. 6, Medium. 7, I always pasture, but not late in the spring. 8, From three pecks to one bushel. 10, Yes. 11, No, think rotation best. 12, Have had more or less trouble with all pests.

*J. M. Crist,—*

1, Eight years. 2, Fulcaster, May, Red Turkey, and Oregon May. 3, Red Turkey and Oregon May. 4, Twenty bushels. 5, Early. 6, From September 20 to October 15. 7, No. 8, One bu. 9, Manure is all right if not too heavy. 10, Yes. 11, Yes. 12, A little rust on late sowing and plowing.

*James L. Powell,—*

1, Nine years. 2, Fultz, White Russian, and Mediterranean. 3, Fultz. 4, Fifty acres, twenty-two bushels. 5, Early. 6, Moderately early. 7, Moderate pasturing does not hurt. 8, One to one and one-fourth bu. 10, No. 11, On hard land, it is all right. 12, Only with chinch bugs. 13, My experience is that land plowed early and reasonably deep and well harrowed gives the best yield.

*W. H. Snook,—*

1, Ten years. 2, Fulcaster and Russian. 3, Russian, 4, One hundred and fifty acres. 5, Early. 6, About October 1. 7, Not too close. 8, Three pecks to one bu. 9, Manuring is all right but there is not enough of it done. 12, Only with rust when pastured too late.



## LINCOLN.

*V. H. Newton,—*

1, Eight years. 2, Velvet Chaff, Winter King and Cap Sheaf. 4, Two hundred acres, fifteen bushels. 5, Early. 6, Early. 7, Yes. 8, One and one-fourth bu. 9, Good. 10, Yes. 11, Yes. 12, Chinch bugs to some extent.

## LOGAN.

*R. J. Barker,*

1, Nine years. 2, Red Russian, Fultz and Gold Drop or Red Chaff. 3, Gold Drop. 4, Ninety acres, nineteen and one fourth bushels. 5, Early. 6, Early. 7, Moderate unless the land is dry. 8, One and one-fourth bu. 9, Tried small area, great success. 10, Yes. 11, Yes. 12, To a limited extent, bugs in 1898; rust in 1900, small damage. 13, The average annual yield is good in this neighborhood. Soil black sandy loam.

*E. A. Bircket,—*

1, Ten years. 2, Turkey and Oregon Red. 3, Turkey for late sowing, Oregon Red for early. 4, Forty acres, fifteen bu. 5, In August. 6, Latter part of September. 7, No pasturing unless wheat is rank. Not late. 8, From one to one and one-fourth bu. 9, Very good results. 10, Yes. 11, Yes. 12, With rust and chinch bugs. 13, We use our highest land for wheat and best for corn. Our wheat in 1900 was damaged by storm and will make about fifteen bushels per acre.

*W. C. Bradwell,—*

1, Ten years. 2, Fultz and Walker. 3, Walker. 4, Fifteen bushels per acre. 5, Early. 7, Not in the spring. 8, One and one-fourth bu. 9, Good. 10, Yes. 11, No. 12, The chinch bugs have been bad for the last few years.

*J. J. Estus,—*

1, Eight years. 2, Fultz, Fulcaster, Turkey, and May. 3, Fulcaster. 4, Sixty-five acres, eighteen bushels. 5, Early. 6, Early. 7, No. 8, One and one-half bu. 9, Good. 10, Yes. 11, Yes. 12, Nothing but chinch bugs. 13, My wheat this year will not be nearly so good as preceding crops on account of late plowing and sowing.

*Geo. A. Garrison,—*

1, Nine years. 2, Fultz, Gold Drop and Blue Stem Mediterranean. 3, B. S. Mediterranean. 4, Thirty acres, twenty

bushels. 5, Early. 6, From the first to middle of September. 7, Pasturing seems to be of benefit. 8, One bu. 9, I have only this to say of manure, that it is the best work that I do to my wheat. 10, No. 11, No. 12, No.

*G. H. Griffith,*—

1, Ten years. 2, Both hard and soft. 3, Soft best for low land and hard for upland. 4, Ninety acres, twelve bushels. 5, Early. 6, Early. 7, No pasturing. 8, One bu. 10, Yes 11, Yes. 12, With chinch bugs.

*Bernhard C. Moritz,*—

1, Eight years. 2, Soft wheat. 4, Forty acres, eighteen bushels. 5, Early. 6, Early. 7, No pasturing. 8, One and one-fourth bu. 10, No. 11, No. 12, Only with chinch bugs.

*B. W. Murphy,*—

1, Nine years. 2, Hard wheat. 4, From nothing to twenty-seven and a half bushels. 5, Early. 6, Early. 7, Not pasture any. 8, One bu. and a quart. 9, Good. 10, For three crops. 11, No. 12, No.

*Joseph H. Norris,*—

1, Ten years. 2, Golden Chaff, Fultz, Fulcaster, Red Russian, and May. 3, Prefer Golden Chaff, Fultz, or Fulcaster. For late plowing and sowing, prefer Red Russian. 4, One hundred acres, twenty-one bushels. 5, July plowing has yielded almost one-third more than September plowing. 6, September 20 to October 10. 7, Some pasturing will not hurt wheat but never pastured heavy. 8, One bu. 10, For five years. 11, No. 12, Not to any great extent. 13, My experience has been that where the ground has been plowed in July and well worked down with a disc harrow that the soft wheat out-yields the hard wheat, except on bottom land where the hard wheat does not do well. On late plowing and sowing, the hard wheat has done best.

*E. J. Oberholzer,*—

1, Seven years. 2, Fultz and Fulcaster. 3, Fultz. 4, One hundred acres, twenty-five bushels. 5, July and August. 6, October 1 to 15. 7, Do not pasture. 8, Five pecks of Fultz. 10, Change every three years. 11, No. 12, No.

*John H. Rhoads,—*

3, Red Russian and Fulcaster. 4, One hundred and fifty acres, twenty-two bushels. 5, I commence plowing July 10, plow deep and finish August 1. 6, Commence September 25. 7, Begin about November 15. 8, One bu. 9, You can't get too much. Head the wheat high and let all the litter on the ground to turn under. 10, Yes, but change seed every two years. 11, Yes, if properly treated. 12, With chinch bugs. I saw some fly for the first this season. It can be avoided by sowing healthy wheat.

*W. J. Richardson,—*

1, Ten years. 2, Turkey. 4, Twelve hundred acres, fifteen bushels. 5, Early. 6; Early. 7, Light. 8, One and one-fourth bu. 9, Good. 10, To some extent. 11, No. 12, Rust on late sowing.

#### NOBLE.

*The 101 Ranch.—*

1, Five years. 2, Red Russian (imported,) Mammoth Red, and Big May. 4, Three thousand acres, twenty one bushels. 5, Early and deep as possible. 6, Early. 7, Yes. 8, One bu. Red Russian, one and one-half bu. Big May, two bu. Mammoth Red. 10, Yes. 12, Very little.

#### OKLAHOMA.

*Fred Beck.—*

1, Ten years. 3, Fultz. 4, One hundred and fifty acres, twenty five bushels. 5, Early. 6, From September 20 to October 10. 7, Yes, up to February 20. 8, One and one-fourth bu. of Fultz. 9, Think manuring of some kind very essential to invigorate the wheat plant. 10, Use a rotation of wheat, oats and corn. 11, No. 12, From rust only. 13, The yield of hard wheat is about twenty five per cent below that of soft this year. Fulcaster did remarkably well. In 1895, I harvested seven bushels to the acre, Red Mediterranean variety, there being practically no rain after the crop was sown until it was harvested. This was on land that was plowed early and harrowed right after the plow, thus putting it in good condition when the seed was sown.

*S. C. Bunstine,—*

1, Four years. 2, Turkey Red, Fultz, and Fulcaster. 3,

Fulcaster. 4, Ninety acres, twenty one bushels. 5, Early. 6, Early. 8, One bu. 10, No. 11, No. 12, Some with rust and chinch bugs. 13, I place particular stress on thorough preparation of the seed bed, sowing only when there is sufficient moisture to insure speedy germination and using only the plumpest and largest grains. I use a fanning mill with an upward blast which lifts up and carries over all light and imperfect grains. Fresh stable manure and ashes either from wood or straw have paid largely for their application. A summer fallow has made a marked change for the better. Now sow cowpeas to turn under and think they are a grand thing for Oklahoma.

I have seen the best of lands worn out by the one crop system and I prefer to remain on the safe side. Would give the land an occasional rest if rotation were impossible. Aside from exhausting the soil, continuous wheat cropping is a good way to 'aid and abet' the chinch bug and other pests of the wheat plant.

*G. M. Draper.*—

1, Eight years. 2, Turkey and Fulcaster. 3, Fulcaster. 4, Fifty acres, twenty bushels. 5, Early as possible. 6, Early. 7, Yes. 8, One and one-fourth bushel. 9, Increases the yield one-fourth. 10, Yes but it does not pay. 11, No. 12, Twenty per cent damage by rust the past two years.

*A. M. Gustin.*—

1, Eight years. 2, Fultz, Fulcaster, Turkey and Pool. 3, Fulcaster. 4, Eighteen bushels. 5, Early every time. 6, From September 25 to October 10. 7, Do not like pasturing unless wheat is too rank. 8, One bu. 9, With good results by top dressing and working in with harrow and disc. 10, Yes. 11, Yes. 12, Fultz was badly damaged by rust. 13, Plow six inches deep and thoroughly fine and firm with harrow, disc and drag.

*J. H. Huddleson.*—

1, Ten years. 2, Fultz, Turkey, Mediterranean and Fulcaster. 3, Fulcaster. 4, Sixty acres, fourteen bushels. 5, Early. 6, Early. 7, No pasturing. 8, One to one and one-fourth bu. 9, Manuring will increase yield one-fourth. 10,

Change about every fourth year. 11, No. 12, Rust, smut chinch bugs and che at

*R. Kleiner.*—

1, Eight years 2, Turkey, Mediterranean, Fultz, and Fulcaster. 3, Fulcaster. 4, Forty acres, fifteen bushels. 5, Early and deep diminishing depth of plowing as season advances. 6, September 1 to 15 for soft, October 15 to November 1 for hard. 7, Moderate advantage. 8, One bu. early, one and one-fourth bu. late. 9, Top dressing increased yields one-third, results of plowing under depend on supply of moisture. 10, Four seasons. 11, No. 12, Black rust two seasons, red rust two seasons, chinch bugs four seasons. 13, Soft wheat in a number of cases has turned into hard when grown here. Fultz is generally considered best for milling. Fulcaster generally gives best test in weight. Soft wheat ranges about three cents above hard wheat but differs, sometimes it may fall below if there is a light offering of hard wheat. Wheat put in stacks is preferred by millers. Wheat cut on the green order handles better, takes less twine, and makes a better sample of grain. Wheat graded for sowing gives better satisfaction, makes a stronger plant, withstands climatical influences better, and increases the quality and quantity of the yield. Small amount of manure applied frequently is better than a large amount applied at one time. Pasturing in very dry or wet weather injures wheat, so does early or late pasturing. Exchanging wheat from different localities if of great importance. Manured ground ripens wheat earlier.

*C. Q. Lewis.*—

1, Four years. 2, Fulcaster and hard wheat. 3, Fulcaster. 4, Forty acres, twenty bushels. 5, Very early. 6, Early. 7, Very light if any. 8, One and one-fourth bu. 9, Good. 10, Yes, three years. 11, Yes. 12, No. 13, My farm is a a sandy loam with a few small sand knolls---crops have increased each year in yield and quality.

*Bernhard Lienenmann.*—

1, Eight years. 2, Fultz and Fulcaster. 3, Fulcaster. 4, Fifteen bushels. 5, In August. 6, Last week in September. 7, I never pasture wheat. 8, One and one-fourth bu. 9, Where manured, I get one-third more. 10, Two crops wheat, one of

corn, one of oats. 11, No. 12, With chinch bugs in dry weather.

*B. F. Meyers.*—

1, Ten years. 2, Big May, Red Clawson, Genessee Giant, Red Cross, Blue Stem, Fultz, and Mediterranean. 3, Blue Stem and Red Cross. 4, Sixty acres, twenty eight bushels. 5, Early. 6, Early. 7, Heavy pasturing is harmful. 8, One and one-fourth bu. 10, No. 11, No. 12, Some rust.

*H. R. Miller.*---

1, Nine years. 2, Fulcaster, Turkey and Red Russian. 3, Fulcaster and Turkey. 4, One hundred acres, fifteen bushels. 5, Early. 6, In September. 7, No pasturing. 8, One and one-fourth bu. Fulcaster, one bu. Turkey. 9, It pays to manure. 10, Change every two to four years. 11, No. 12, Rust and chinch bugs. 13, The best wheat I have raised was in '97, the ground being turned in the spring and kept cultivated during the summer to keep clean. The yield was thirty bushels of Fulcaster wheat testing sixty two lbs. The soil was upland.

*W. H. Odor.*---

1, Four years. 2, Fultz. 4, Seventy five acres, eighteen bushels. 5, Early. 6, Early. 7, Yes, if not pastured too late in the season or when too wet. 8, One and one-fourth bu. 10, No. 12, Have been damaged by rust. Rust never bothers until just about harvest time, and some seasons when wheat is earlier does not affect it.

*E. C. Pauly.*---

1, Nine years. 2, Turkey, Fulcaster, and Fultz. 3, Hard for upland, soft for bottom land. 4, Seventy acres, fifteen bushels. 5, Early. 6, Early. 7, Yes, when dry and good growth. 8, From one to one and one-fourth bu. 9, Paid well. 10, Yes. 11, Yes. 12, Rust one year, chinch bugs. 13, I have done well with cattle and think they go well with wheat.

*B. L. Payton.*---

3, Fulcaster. 4, One hundred acres. 5, Early. 6, Early. 7, Very light. 8, One and three eighths bu. 10, Yes. 11, Yes. 12, No.

*H. Reding.*---

1, Four years. 2, Fulcaster and hard wheat. 4, Four hun-

dred and twenty five acres, twenty four bushels. 5, In early August. 6, September 17 to October 1. 7, No. 12, Rust and smut catch the late sowing first. 13, Thorough preparation of the seed bed is essential.

*J. F. Wagner*.---

1, Five years. 2, Fulcaster, Fultz, Russian, Turkey, and Big May. 4, Twenty one bushels. 5, Early. 6, Early. 7, Very light. 8, One and one-half bu. 9, Good on land manured and plowed early. 10, Yes. 11, No. 12, Some rust. 13, I consider deep plowing very desirable.

#### PAWNEE.

*John Welker*.---

1, Eight years. 2, Fultz, Oregon Red, and Fulcaster. 3, Oregon Red. 4, One hundred and thirty acres, twenty bushels. 5, Early. 6, Early. 7, When it is not too windy and dry. 8, One and one-fourth bu. 9, Good. 10, No. 11, No. 12, Only with chinch bugs.

#### PAYNE.

*N. B. Easton*.---

1, Ten years. 2, Oregon Red, Fultz, Egyptian Amber, and Red Russian. 4, Five hundred acres, seventeen bushels. 5, The earlier, the better. 6, In September. 7, Yes. 8, One to one and one-half bu. 10, Yes. 11, Yes. 12, With all except the Hessian fly.

#### POTTAWATOMIE

*A. M. Carleton*.---

1, Two years. 2, Fulcaster. 4, Sixty acres, twelve bushels. 5, Early. 6, In September. 7, No. 8, One and one-fourth bu. 10, No. 11, No. 12, Some chinch bugs but not enough to hurt. 13, My land is new and by changing the crops from wheat to corn and oats, does not need manure.

*John Koelsch*.---

1, Eight years. 2, Fulcaster and Red Russian. 4, Thirty acres, fourteen bushels. 5, Early. 6, Early. 7, No. 8, One to one and one fourth bu. 10, Yes. 11, Yes. 12, With rust and chinch bugs.

*G. W. Martin,---*

1, Eight years. 2, Fulcaster and Turkey. 3, Red Russian. 4, One hundred acres. 5, Early. 6, Early. 7, With good stand and vigorous growth, yes. 8, One and one-half bu. 9, Farmers will have to manure their land to make wheat profitable. 10, Yes, 11, No. 12, With rust and chinch bugs.

*J. W. Martin,---*

1, Eight years. 2, Fultz, Fulcaster, May and Turkey. 3, Fulcaster and Red Russian. 4, Sixty acres. 5, Early. 6, As near September 5 as possible. 7, Pasture a rank and good growth. 8, One and one-fourth bu. 9, Fine results. 10, Yes. 11, No. 12, Rust last year and always chinch bugs.

*F. H. Springer,---*

1, Nine years, 2, Fultz, Fulcaster and Turkey. 3, Turkey. 4, Twenty nine acres, thirteen and one-half bushels. 5, Early 6, Early. 7, Moderate pasturing. 8, One and one-fourth bu. 10, Three crops. 11, No. 12, Black rust on low ground and smut to some extent.

*A. D. Stuber.—*

1, Nine years. 2, Early May, Fultz, White Russian, and Fulcaster. 5, Early. 8, One to one and one-fourth bu. 9, Use all I can get with gratifying results. 13, There was an insect we called a louse infested the fields last season and I believe caused considerable loss

#### WASHITA.

*Levi W. Collins.—*

1, Four years. 2, Red Turkey. 4, Seventy acres, eighteen bushels. 5, Early. 6, Generally early. 7, Yes, if not pastured too late. 8, One bu. 10, Yes. 11, Yes. 12, No. 13, My wheat has always been of good quality.

#### WOODS.

*C. L. Higday,—*

1, Five years. 3, Turkey wheat. 4, Forty acres, twenty seven bushels. 5, Early. 6, Early. 7, Yes. 8, One bu. 10, Yes. 11, No. 12, No.

*Wm. Hungerford.—*

1, Six years. 2, White Russian and Turkey. 4, Two hundred acres, twenty bushels. 5, Early. 6, Early. 7, Light



pasturing. 8, One bu. 10, Yes. 11, No. 12, With chinch bugs until this year. 13, The wheat that has been thrashed this year is running from twenty five to thirty bushels per acre.

OSAGE NATION.

*S. J. Soldani.*—

1, Ten years. 2, Fultz and Fulcaster. 3, Fultz. 4, Three hundred acres, eighteen bushels. 5, Early. 6, Depends on season, early preferred. 7, Of advantage when not too late. 8, One and one-fourth bu. 10, No. 11, No. 12, Very little except rust.

## EXPERIMENTS WITH WHEAT, 1900.

F. C. BURTIS.  
J. G. KERR.

### SUMMARY.

I. The wheat season of 1899-1900 was quite a favorable one, and large yields were the rule on well tilled land. A dry fall and rust in the spring were the only draw backs.

II. Wheat on July plowing yielded 7.84 bushels per acre more than wheat on August plowing; and 16 bushels more than on September plowing.

III. The grain on the early plowing was of a much better quality than on the late.

IV. The plowing and preparing of the early plowed plats was much less expensive than the August or the September plowing.

V. Results of trials at this station in former seasons agree, in general with II, III and IV.

VI. July plowing that had been well worked down, retained over twice the amount of moisture that unplowed ground did during a very dry August and September, and twenty-four days of October.

VII. On the July plowing, at no time during this drouth, of which there was a period of sixty days in which less than an inch of rain fell, was the moisture content of the soil too low to germinate the seed, nor did the crop suffer.

VIII. Moisture, equal to an inch and a half of rain was lost in a few days from unplowed ground in August and September, while there was a very small loss from the early plowed ground.

IX. Land, plowed in August, while the ground was hard and dry but worked down at several successive intervals with the aid of light showers, retained more moisture and carried the wheat through a severe drouth much better than the September plowed ground did.

X. Wheat seeded September 15th, yielded two bushels more per acre than wheat seeded October 18th, and thirteen and one third bushels more than wheat seeded November 15th.

XI. The wheat from the late seeding weighed seven pounds less per bushel than the early or medium seeding.

XII. In six former trials at this station, the November seedings ranged in yields from 1 to 13 bushels per acre; the October seeding, 4 to 30 bushels; the September seeding 15 to 49 bushels per acre.

XIII. In 1898-'99 wheat on land that received an application of 15 1-2 tons of stable manure per acre, yielded six bushels more than double the yield on unmanured land.

XIV. In 1899-'00, wheat on the same manured land that had received an additional 11 tons of stable manure per acre, yielded twice as much as the same unmanured land.

XV. The majority of the following varieties have been grown on the station farm for six years, and can be recommended.

SOFT, SMOOTH WHEATS.

Early Red Clawson, Fultz, German Emperor.

SOFT, BEARDED WHEATS.

Fulcaster, Missouri Blue Stem, New Red Wonder.

HARD, SMOOTH WHEATS.

Red Russian, Oregon Red.

HARD, BEARDED WHEATS.

Sibley's New Golden, Turkey, Eversaw.

XVI. In 1899-'00, the yield of seventeen varieties averaged forty bushels per acre. Sibley's New Golden gave the largest yield, 44.5 bushels. Big English the smallest, 37.7 bushels per acre.

XVII. In the averages for six years, '93, '96, '97; '98, '99 and 1900, Sibley's New Golden stood first with an average yield of 29.2 bushels, and Big English last with a yield of 26.3 bushels per acre. Several other varieties were only a half bushel below Sibley's New Golden.

#### SEASON.

In the locality of Stillwater, Oklahoma, the season of 1899-1900 was, on the whole, favorable to a large wheat crop. A rainfall of 4.54 inches in July gave excellent opportunity for plowing in that month, which made the benefits of early plowing available. The conditions for plowing in August were only fair as the rainfall for the month was only 2.57 inches. Of this, .83 of an inch fell on the 14th and 1.42 inches on the 25th, On ground that had not been plowed and was covered with weeds, these rains wet the ground hardly enough to make any difference in the plowing, and in three or four days the effects of them were all gone. On the ground that had been plowed early and worked down, the rain was taken in by the soil and retained, which put it in fine shape. A rainfall of only .88 of an inch in September and none to speak of until the 25th of October, accompanied by hot, dry weather, practically stopped plowing during September and October; and on ground that had not been plowed early and prepared thoroughly, made seeding very precarious; and damaged wheat very much that was sown on such ground. On land that had been plowed early and worked down, the ground contained ample moisture for germinating the seed and continuing the growth. In fact, wheat on such ground suffered practically none during the drouth of September and fore part of October, while wheat on poorly prepared land suffered considerably. A rain of .65 of an inch on October 25th, 3.40 inches on the 26th, and .9 of an inch on the 27th, thoroughly wet the ground and some plowing was done after this and much seeding and some reseeded. This heavy rain saved a great deal of wheat on late plowed, open, loose land that would have perished under ordinary conditions. A rainfall of 1.93 inches in November and 1.60 inches in December, well distributed through each month, along with fine growing weather, brought the wheat up to the first of the year in a much improved condition and on properly tilled land, in most excellent shape. Conditions continued good through

January with .23 of an inch of rain. The weather was open and mild with very little snow. Not until February did the wheat freeze to speak of and then only the top portions of the plants. The ground where it had been well tilled was kept in good condition by .89 of an inch of rain and light snow during this month. March continued favorable. Fifty hundredths of an in. of rain kept the moisture content of the soil at 16 per cent and spring growth started vigorously. The fact that the surface was a little dry was a preventive against the freezing and thawing that so often damage wheat in the spring when the surface is water-soaked. But March of 1900 was mild and there was little danger of this trouble. April and May afforded most excellent conditions. The rainfall for the former month was 4.43 inches and the latter 3.71 inches, and was remarkably well distributed in each. The weather was cool and no damaging storms occurred.

Hot, muggy weather the latter part of May and the fore part of June developed a vigorous crop of rust; early wheat was damaged slightly, but late wheat was cut short at least 25 per cent by rust-curing or premature ripening. The conditions for harvesting and stacking were perfect, and wheat of a good variety on properly tilled soil, seeded at the proper time, turned out thirty to forty bushels per acre; and of a good plump quality. Failure to take advantage of the opportunities offered was about the sole cause of lower yields than the above in this locality.

*Meteorological Table 1899-1900.*

MONTH	TEMPERATURE			RAINFALL Inches
	Mean	Max	Mean Min	
1899—July.....	89.4		69.4	4.54
August.....	89.9		71.7	2.57
September.....	91.3		56.2	.88
October.....	80.9		50.1	* 5.15
November.....	65.5		43.7	1.03
December.....	47.6		28.3	1.60
1900—January.....	52.3		26.8	.23
February.....	49.1		24.1	.79
March.....	63.2		35.7	.51
April.....	71.5		49.4	4.43
May.....	76.8		57.7	3.71
June.....				3.28

\* 5.05 inches of this fell after October 24th.

## SOIL.

The college farm is classed as upland prairie soil of medium fertility. The land has been in cultivation nine years and a judicious rotation of crops practiced. Where the wheat experiments were situated, the soil is fairly uniform in texture and quality. Some of the experiments were on manured land and some were not. This will be noted under each experiment.

## TREATMENT OF THE LAND.

Part of the land was oat ground and part corn. Where special treatments are not given it was handled as follows: That which was in small grain was plowed in July, harrowed after each day's plowing, and every week or two after that, until seeding time. The corn ground was entirely free of weeds and grass, and had the surface kept loose during the summer with a one horse cultivator after the corn was too large to work with two. The corn ripened early in August and was cut and shocked, and the ground given a thorough disking at once among the shocks and then harrowed. The corn was husked early in September, the fodder removed and the ground disked where the shocks stood and all harrowed, which put it in good shape for seeding.

The following experiments were under way the past season and with more or less modifications are continuations of those carried on in previous years.

- I. Early, medium, and late plowing.
- II. Early, medium, and late seeding.
- III. Wheat continuous with and without manure.
- IV. Tests of varieties.

## EARLY, MEDIUM AND LATE PLOWING.

According to plan, this experiment will be continued several years and plowings are to be made at three periods;

First, Between July 10th and 20th, and will be designated early plowing:

Second, Between August 10th and 20th, to be called medium plowing;

Third, Between September 10th and 20th to be called late plowing.

The ground is to be harrowed after each plowing and kept

in good condition until seeding time by as frequent harrowing as necessary. All treatments are to be seeded on the same date, at the same rate per acre with the same variety, and otherwise treated alike. The plowing on all treatments is to be eight inches deep.

*Results of 1899 1900.*

Six large plats 30x372 feet were laid out adjoining each other separated by three foot alleys. The ground was that from which a crop of oats had just been harvested, and was fairly uniform in quality. It never had received any manure. Plats one and four were plowed July 19, plats two and five August 15th, plats three and six September 11.

*Early Plowing.*

At the time of the July plowing, the ground was moist and mellow, and all turned up in good shape and one harrowing put it in fine order. The plats were harrowed again on August 15th, August 30th, and September 11th. This kept them free from weeds and covered with a loose dirt mulch that held the moisture.

*Medium Plowing.*

A rain of .83 of an inch on August 14th, the day before this plowing, helped matters a little, but only in places did it wet down as deep as the plowing, and the ground plowed up more or less dry and lumpy. Two harrowings were necessary to level it down, and still quite a number of clods were left and the ground was rough in places. A rain of 1.42 of an inch on August 25th was a great help in getting these plats in condition. Further harrowings were made on August 30th and September 11. This put the ground in very good shape to receive the seed but not as fine and mellow as that on the early plowing.

*Late Plowing.*

The September plowing was done with the greatest difficulty. The rains that had greatly benefitted the plats which had been plowed had left no effect on the unplowed ground. It was hard and dry as deep as plowed and turned up in large lumps. Only with repeated disking, rolling, and harrowing was it put in any kind of shape, and still the surface was very

cloddy and rough. During the operations of disking etc., it was considered that about eight times the labor was put on it that would have been needed if the ground had been moist at the time of plowing. If it had not been that it was desired to seed all the plats at the same time, it would have been better to have waited until showers softened the clods some and then put a pulverizer on at once, even if it did make the seeding later.

An important point to consider in connection with late plowing for wheat is the weeds on the ground that help take its moisture, and go to seed making foul ground for future crops. Where this experiment was situated the soil was unusually free of weed seed, but some were present. On the August plowing the weeds were scattered and a part of them had gone to seed but many of them were not matured. On the September plowing the weeds had gone to seed, but were not thick on the ground. Preventing weeds going to seed, and ridding the land of others that are started and destroyed by the frequent harrowings on early plowing, will well pay for an extra effort to do early plowing, to say nothing about the increase in yields of wheat that are obtained.

All the plats were seeded on September 15th with Fulcaster wheat at the rate of one and one-half bushels per acre. The seeding was done with a shoe drill with press wheels. On the early plowed plats, under a surface covering of an inch of fine dry dirt, the ground was moist and in fine shape for starting the seed that was put down into this. On the medium plowed plats the soil was not quite as well pulverized nor quite as moist as on the early plowing, but in very fair condition to receive and start the seed. On the late plowed plats the ground was perfectly dry as deep as plowed and too cloddy to enable covering the seed in places. Here the seed would not start until a rain fell. A rain of .62 of an inch fell on September 17, which put the early and medium plowing in the best shape but on the late plowing was really a detriment, as it moistened the seed enough to start about two-thirds of it and the month of very dry weather which followed caused nearly half of this to perish, while the growth on the early and medium plowing was going on very well. On September 25 the early plowed plats were up with a good even stand, and most of the plants on the



medium plowed plats, but were more or less irregular and it was three or four days later before all were up. The plants on the late plowed plats did not appear before the 25th and only about two-thirds of the seed germinated at this time. The rest germinated after the rain of October 26th.

Although checked somewhat by the drouth, the wheat on the early and medium plowed plats continued to grow and at no time was injured for lack of moisture during the severe drouth of September and October. On the other hand, many of the plants perished on the late plowed plats and the others were damaged. The abundant rainfall of 4.15 inches on October 25th and 26th was a great help to all the wheat and especially the late plowing. It dissolved most of the clods and settled the soil. The early plowing went into the winter with a fine growth, the medium with very good, the late plowing had only a thin, small, irregular growth, but it was improving as each week passed. All went through the winter in very good shape. About heading time, little difference could be seen between early and medium plowing, but the late still had an irregular thin stand. The wheat on the late plowing was several days later than that on the early and suffered much more from the rust.

Table one gives the yields, time of heading, quality of grain, etc.

TABLE I.

*Early, Medium and Late Plowing.*

AREAS OF PLATS, 11,160 SQUARE FEET.

Plat No.	TREATMENT	Head-ed	Ripe	YIELD PER PLAT, LBS		YIELD PER ACRE		TEST PER BU		No. of Stalks in 16 Feet of row
				Grain	Straw	Grain Bu.	Straw Tons	A	B	
1.....	Early plowing	May 8	June 9	479	971	31.16	1.89	59 $\frac{1}{2}$	.....	324
2.....	Medium "	May 10	June 9	382	663	24.85	1.29	58 $\frac{1}{2}$	.....	282
*3.....	Late "	May 21	June 9	222	478	16.04	1.03	54	.....	229
4.....	Early "	May 8	June 9	484	886	31.48	1.72	60	.....	300
5.....	Medium "	May 10	June 9	340	600	22.11	1.17	58 $\frac{1}{2}$	.....	307
6.....	Late "	May 21	June 9	224	496	14.57	.93	50 $\frac{1}{2}$	.....	223
AVERAGE OF SIMILAR PLATS.										
1 & 1	Early plowing.....					31.32	1.812	59 $\frac{1}{2}$	60	312
2 & 5	Medium plowing.....					23.48	1.233	58 $\frac{1}{2}$	60	294
3 & 6	Late plowing.....					15.30	1.002	52 $\frac{1}{2}$	56	226

\* 10.044 Sq. Ft.

The column headed 'No of stalks in 16 foot of row' is given to show the variations in stand on the different treatments. The data were obtained by making six counts in different places in each plat, and they were added and averaged. Being so thin the heads on the late plowing were large and fine. A great difference is shown in the time of heading of some of the treatments. While there was but little difference between the early and medium plowing, the late plowing was about two weeks later than the early. The date of ripening is given the same but the wheat on the late plowing was prematurely ripened by rust and very much shrivelled, while the others were very well filled as may be judged from the test per bushel. That given in the table, column B., is of the wheat after fanning, with more or less small and light grains of chaff removed. That given in column A is of the wheat before fanning. The early and medium plowings were very well cleaned in thrashing but the late had some little chaff and white caps in it. In fanning, 18 per cent. of small grains and chaff was taken out of the early and the medium, and 21 1-2 per cent. out of the late.

The majority of the grains from the early and medium plowed plats was shrivelled slightly and some badly, but the wheat from the late plowing was all badly shrivelled and would bring 4 to 5 cents less per bushel than the others. Besides being so much inferior in quality, the yield was less than half of that on the July plowing. The yield from the August plowing was eight bushels less than on the July.

Although it was not thought best to do so with this experiment, the late plowing would have probably given a better yield, if the ground had been reseeded after the October rains, or harrowed and pulverized after the rain of .62 of an inch on September 17, two days after the seeding.

In 1898-1899 plats plowed in July gave an average yield of 23.1 bushels per acre as compared with 16.8 bushels per acre on September 3 plowing.

A question that comes up in connection with this experiment is, "to plow or not to plow when the ground is hard and dry." Not if it can be done at some other time, but if not done in good season while the ground is moist, then plow, even if it is hard and dry, and especially if the plowing has gone until August. It will be better than September plowing. In August

and September unplowed ground is dry and hard the greater part of the time. A rain of an inch may help for a day or so, but the effect is soon gone. While, if this ground had been plowed, though it was ever so lumpy, one quarter of the above amount of rain would enable most of the clods to be crushed if done at once, and with the help of the light showers we always get from time to time, would enable getting it into good shape by seeding time, as was done with the August plowing in this experiment. See results under table elsewhere in this bulletin giving moisture content of soils.

Often good results of early plowing are lost by not working the land sufficiently afterwards and keeping it free of weeds. Only surface stirring should be given as the time of seeding approaches.

#### EARLY, MEDIUM AND LATE SEEDING.

This experiment is to be repeated for several years and the plan is to make seedings at three periods. First, September 12 to 21 to be called, early seeding; second October 12 to 21 to be called medium seeding; third November 12 to 21 to be called, late seeding. Red Russian wheat is to be used and all the seedings are to be made at the rate of 1 1-2 bushels per acre with a shoe drill.

The preparation of the land for all the seedings will be made at the same time and in like manner for each plat.

#### *Results of 1899-1900.*

The plats were situated on the corn ground mentioned elsewhere and the land was prepared as stated there. The ground was manured with stable manure the spring of 1899. Six plats 30x367 feet, separated by two foot alleys, were used. Plats, 38 and 41, were seeded September 15, plats 39 and 42, October 14, plats 40 and 43, November 15. The ground was in very good shape for seeding, level and mellow enough so that the seed could be thoroughly covered, and was protected on top by a loose dirt mulch.

#### *Early Seeding.*

The September seeding went into moist dirt and was greatly aided by the rain of September 17 and the wheat was up in fine shape within a week. This seeding was retarded somewhat by the dry weather of September and October. How-

ever, it did not damage any and came out nicely with the aid of the October rains.

*Medium Seeding.*

At the time of the October seeding the ground was getting quite dry and only a part of the seed went into dirt moist enough to start it. But all was brought out in good shape by the rains of October 25th and 26th, but a large part of the seed was two weeks from the time of planting in coming up.

*Late Seeding.*

The ground was in fine shape at the time of the November seeding but, due to the cool weather, the plants were about twelve days in coming up. All except the late seeding went into the winter in shape to stand the usual freezes. The late seeding was two inches tall and had not tillered any and the crown roots had made but a small start. On the early seeding the plants covered the ground and had tillered profusely and had made a good root growth. The medium was very good but not quite as forward as the early.

The remarkably mild winter brought all through in good shape. The spring growth on the early and medium seeding was much more vigorous than the late, but very favorable conditions brought the latter out very rapidly and considerable tillering took place in the spring. At the time of heading, little difference could be seen between the early and medium seeding, but the late was much more irregular in growth and more backward.

Table two gives yields of grain, straw, and other results of interest.

TABLE II.

*Early, Medium and Late Seeding,*

AREA OF PLATS, 11.010 SQUARE FEET.

Plat No.	TREATMENT	Head-ed	Ripe	YIELD PER PLAT, LBS		YIELD PER ACRE		TEST PER BU		No. of Stalks in 16 Feet of Row
				Grain	Straw	Grain Bu.	Straw Tons	A	B	
38.....	Early seeding	May 5	June 4	547	903	36.07	1.78	59½	.....	464
39.....	Medium "	May 10	June 7	550	1045	36.26	2.07	58½	.....	339
40.....	Late "	May 14	June 9	387	908	24.2	1.77	48½	.....	346
41.....	Early "	May 5	June 4	569	1016	37.52	2.01	58	.....	384
42.....	Medium "	May 8	June 7	507	958	33.43	1.89	55½	.....	336
43.....	Late "	May 14	June 9	345	945	22.75	1.69	47	.....	389
AVERAGE OF SIMILAR PLATS—										
38&41	Early seeding.....					36.8	1.89	58½	60	424
39&42	Medium seeding.....					34.84	1.98	57	60	337
40&43	Late seeding.....					23.47	1.82	47½	53	367

The data on the number of stalks in 16 foot of row was obtained as in the former experiment. It is shown under that heading that there was a good stand on all plats and that it was a little better on the late than the medium. Column A gives the test per bushel before fanning, and column B the test after fanning. All except the late seeding was fairly clean as it came from the thrasher. In fanning, the small and shrivelled grains and the trash were taken out. From the early seeding, 37 per cent. from the medium, 21 per cent. from the late 42 per cent. was removed. There was a good many grains more or less shrivelled in the early and medium, but on the other hand, the larger part of the late was badly shrivelled and tested seven pounds less per bushel after fanning than the early and the medium. The medium was four days, and the late, nine days later heading than the early seeding. The grain of the early and medium seeding was in the hard dough stage when the rust struck the wheat and was not damaged much by it, but the late was in the milk and soft dough stage and was much damaged by premature ripening with the rust. The fact that the Red Russian is an early variety saved it somewhat from the rust. The yield was only two bushels less on the medium than on the early seeding, but there was a difference of 13 bushels between the late and early, and when considered in connection with the much poorer quality, it makes a wide difference in dollars and cents. As has been noted elsewhere, this season gave more favorable conditions for late seeding than usual, and one very important point is that the rust was about a week later in appearing than usual. Again the late seeding was on land prepared early and thoroughly and at time of planting, had a firm seed bed; while late seeding is generally done on late plowing and poorly prepared for the seed.

*Results of Former Trials and Comparisons.*

*Bushels Per Acre.*

YEAR	DATE OF SEEDING		
	Sept. 15	Oct. 15	Nov. 15
*1895-96 .....	17.5	4.6	1.3
1896-97 .....	49.2	30.7	7.7
1897-98 .....	15.0	17.9	13.1
1898-99 .....	29.6	16.7	3.5
1899-00 .....	36.8	34.8	23.5

\* Seeded Oct. 1, Oct. 30, Nov. 30.

On late seeding, especially if the ground is poorly prepared about one half more than the usual amount of seed should be used per acre.

WHEAT CONTINUOUS, WITH AND WITHOUT MANURE.

This experiment was started from the virgin soil in 1892 when the prairie sod was broken, but has been modified somewhat since. In that year a square acre was laid off and the intention then was to crop this continuously to wheat for a long period of years without the addition of a fertilizer. In 1896-'97 the acre was divided into halves and the yields of each kept separate, but the treatment of the land was not altered until the summer of 1898. Table III gives the results up to the time of the change of treatment.

TABLE III.

*Wheat Continuous Without Manure.*

YEAR	YIELD PER ACRE	
	Grain, Bu.	Straw, lbs.
1892-93 .....	10.55	1422
1893-94 .....	20.90	2077
1894-95 .....	Crop failure	
1895-96 .....	7.10	1889
1896-97 .....	17.80	2268
1897-98 .....	7.25	1241

At the beginning of the season of 1898-'99 the plan was altered. Plat 2 was to be continued as before without manure. Plat 1 was to receive about 15 tons of well rotted manure per acre each year. According to this plan 15720 pounds of stable manure was put on plat 1 before plowing in the summer of 1898.

This plan will be continued in so far that about the same amount of manure will be put on per year, but will be applied only as often as thought beneficial, and not every year. Fultz wheat has been used each year with the exception of 1893-'94 when Currell was used. The use of Fultz wheat will be continued and seeded at the rate of one and one-half bushels per acre. The ground is to be plowed in July and kept well worked until seeding time.

*Results of 1899-1900.*

July 18, 11350 lbs of well rotted stable manure was put on

plat 1, and both plats plowed immediately. Sept. 19, both plats were seeded. The ground was in very good tilth at time of seeding and moist enough to germinate the seed. The wheat came up readily, but from the start, that on the manured ground made a much better growth. Both plats passed through the fall drouth without injury and went into the winter in good shape. The plants on the manured ground had tillered profusely, while those on the unmanured plat had stooled only ordinarily. The spring growth was much more vigorous on plat 1, and by the middle of April was three times as large as the growth on the unmanured ground; and really seemed to have too thick a stand. May 2, plat 1 commenced to head and the growth was so rank that it lodged in places, and some lodging took place after this, but not enough to damage the grain. Plat 2 did not lodge at all. On this, the straw was shorter, thinner on the ground and more backward.

Table IV gives the results for the past season.

TABLE IV.

*Wheat Continuous, With and Without Manure.*

TREATMENT	Stalks in 16 Feet of Row	Date of Heading	Date of Ripening	YIELD OF PLAT		YIELD PER ACRE		Test Per Bu.
				Grain lbs.	Straw lbs.	Grain Bu.	Straw Tons	
Plat No. 1, manured.....	522	May 11	June 5	1104	2501	36.8	2.5	60½
Plat No. 2, unmanured.....	401	May 15	*June 7	543	1167	18.1	1.16	57½

\* Rust cured.

The heads on the unmanured plat were larger, due to the thinner stand; but they were several days later in maturing and were damaged much more by rust, making a poorer quality of grain as is shown by the test per bushel. The yield of grain per acre was half that of the manured plat. While both plats yielded better than in 1899, the difference in favor of the manured ground was more in that year. Probably in seasons when the rain fall was not as much as that of April and May of the past season, the wheat would not have lodged any on the manured ground.

From the results of the past season, it was concluded that the second application of manure was of little value and none will be put on again for a year or so.

In table V the results of several previous seasons are given for comparison.

TABLE V.  
HALF ACRE PLATS.

YEAR	Plat No.	YIELD PER ACRE		Treatment
		Grain Bu.	Straw Tons	
1896-97 .....	1	17.8	1.13	Unmanured
	2	17.9	1.14	Unmanured
1897-98 .....	1	7.0	.57	Unmanured
	2	7.5	.66	Unmanured
1898-99 .....	1	30.8	1.65	Manured
	2	12.0	.68	Unmanured
1899-00 .....	1	36.8	2.50	Manured
	2	18.1	1.17	Unmanured

It is too early in the experiment to study the decrease in yield from continuous cropping, as the results from season to season vary so much. After the experiment has been running a series of years the results can be grouped in three or five year periods to do away with season variations, and then more reliable conclusions may be drawn.

The treatment received by the unmanured plat in this experiment is much better than that given the average field where continuous wheat growing is practiced. This plat is plowed deep and early and given frequent harrowings between that and seeding time; this breaking apart and re-exposing the soil grains to the air helps to liberate the plant food stored in them. Thorough working of land at the proper time does much to keep up the fertility.

#### VARIETY TESTS.

From some two hundred so-called varieties of wheat that were grown on the station farm during the first few years of its work, about a dozen have been selected that have given the highest yields and shown evidences of other desirable characteristics. These have been planted each year since 1892 with the exception of 1893-'94, and along with occasional newly introduced varieties of supposed superiority. New varieties that are not found desirable are dropped after a year or so, and those found to have superior merit are grown along with the old standard varieties that will be continued for a series of years. All the seed used on the station farm is very carefully



selected and graded each year and our results will throw some light on the question as to whether a variety will run out if good seed is used.

In the variety tests where so many plats have to be used, they cannot be as large as would be desirable, or duplicated as in other experiments where there are only a few plats. To help do away with the inequalities found in the average soil, the plats are made long and narrow, generally the width of the drill, five feet wide by three or four hundred feet long. To facilitate harvesting, a two foot alley is left between plats and kept free from growth of any kind. This alley stimulates the growth a little along the edges of each plat and may increase the yield of each, slightly, but it does not invalidate the comparison between varieties in the experiment as all are under the same conditions. After taking every precaution, there is quite a variation between the yields of varieties due to the inequalities of the soil, and because one variety in an experiment has given a yield of four or five bushels per acre more than any other in a single season, it does not always follow that it is a better variety. To throw light on the differences that may be caused in the yields due to the inequality of soil, some two or three of the standard varieties are repeated several times in each trial.

*Results of 1899-1900.*

The experiment was situated on the corn ground mentioned elsewhere and that was manured the spring of 1899. A large number of the plats were 5x362 feet. Due to the seed of some of the new varieties arriving late, the plats were seeded on three different dates and are grouped accordingly in the table, and only those seeded on the same date should be compared. The most of the plats were seeded on September 23, and the ground was a little dry at that time and they came up more or less irregularly, but all came out well with the October rains, and went into the winter in very good shape. The mild winter was no test of the hardiness of the various varieties. All had a perfect stand in the spring and did well until harvest time, with the exception that rust damaged all some, and especially the late varieties. The growth of straw was tall but none of the varieties lodged enough to damage the crop.

Table VII gives the yields of grain and other data of interest.

TABLE VII.  
*Variety Tests 1899-1900.*  
 SEEDED SEPTEMBER 23—AREA OF PLATS 1810 SQUARE FEET.

Plat No.	VARIETY	Hard or Soft	Smooth or Bearded	When Headed	When Ripe	YIELD OF PLAT		YIELD PER ACRE		TEST	
						Grain Pounds	Straw Pounds	Grain Bushels	Straw Tons	Before Fanning	After Fanning
7	Red Russian	M	S	May 10	June 5	103	162	41.31	1.949	58	60½
8	Fulcaster	S	S	May 10	June 6	96	154	38.51	1.853	60	60
9	Big English	S	S	May 10	June 7	94	156	37.70	1.877	58	59½
10	German Emperor	S	S	May 10	June 7	110	175	44.12	2.106	59	61½
11	Fultz	S	S	May 10	June 6	98	172	39.31	2.070	60½	61½
12	Mo. Blue Stem	S	B	May 10	June 6	96	179	38.51	2.154	60	61
13	Early Ripe	H	B	May 10	June 6	100	160	40.11	1.928	58	61
14	Red Russian	M	S	May 6	June 5	89	136	35.70	1.636	58½	60½
15	Fulcaster	S	B	May 10	June 6	104	186	41.72	2.238	59½	61
16	New R-d Wonder	M	B	May 5	June 6	103	152	41.31	1.829	60	62
17	Sibley's New Golden	H	B	May 10	June 7	111	174	44.52	2.094	59	60½
18	Pickaway	M	B	May 5	June 6	106	154	42.52	1.853	56	60
19	Early Red Clawson	S	S	May 10	June 6	103	147	41.31	1.769	55½	60
20	Turkey (Local)	H	B	May 10	June 7	105	190	42.12	2.286	57	61
21	Turkey (Wash.)	H	B	May 10	June 7	107	220	42.92	2.647	59	61
*22	R-d Russian	M	S	May 10	June 6	64	106	41.49	2.026	58½	60½
23	Fulcaster	S	B	May 6	June 6	103	187	41.31	2.250	59½	60½
* 1120 Square feet.											
SEEDED OCT. 4.—AREAS OF PLATS, 24 TO 27, 10990; 28 TO 32, 1810 SQUARE FEET.											
24	Turkey	H	B	May 10	June 9	393	837	25.96	1.659	57	58½
25	Sibley's New Golden	H	B	May 10	June 9	522	948	34.48	1.879	.....	60
26	German Emperor	S	S	May 10	June 9	511	919	33.75	1.821	.....	58½
27	New Red Wonder	M	B	May 10	June 9	529	911	34.94	1.805	.....	60½
28	Eversaw	H	B	May 9	June 9	95	180	38.11	2.165	58½	59
29	Oregon Red	M	S	May 10	June 9	96	174	38.51	2.094	57	59
30	Big Frame	S	S	May 5	June 4	74	126	29.68	1.516	57½	59
31	Crimean	H	B	May 14	June 9	82	143	32.89	1.721	56	58½
32	Zimmerman	S	S	May 5	June 4	60	115	24.07	1.383	54½	57
SEEDED OCTOBER 10.—AREAS OF PLATS, 33 TO 36, 1095; PLAT 37, 2190 SQUARE FEET.											
33	3821	H	B	May 13	June 13	30	100	19.89	1.989	.....	52½
34	3822	H	B	May 13	June 13	41	109	27.18	2.168	.....	54½
35	3823	H	B	May 13	June 13	45	110	29.54	2.188	.....	54
36	3824	H	B	May 13	June 13	20	70	13.26	1.392	.....	52
*37	2957	H	B	May 13	June 13	4	31	1.33	.31	.....	.....
* Only 5 per cent. of a stand, due to poor seed.											

In the table the varieties are classed as hard, medium and soft. This classification is not an arbitrary one and would vary some as passed upon by different judges. A miller from a hard wheat district of the north would class many as soft, that a miller from a soft wheat district would call hard. The soft wheats are generally much lighter in color while the hard wheats are dark and have a more or less opaque appearance. As a rule, wheat that is badly mixed is bought as hard wheat even if the larger part is soft. There is a belief in this part of the territory that soft wheats have a tendency to grow hard in this country. Some of our soft wheats have been grown here for several years and are still classed as soft. The varieties in this list do not differ many days in the time required for maturing, but the date of heading should be taken for this comparison as all ripened about the same time; the later ones being rust cured. The grain of all varieties was of a very good quality except the very late seeded ones and the seed of those was badly shrivelled.

Seed for plats 33 to 37 was furnished by the U. S. Dept. of Agriculture, and was imported by them direct from Hungary, and was said to represent the highest grades of the region which is our chief competitor in the production of fine flour. The lateness of the seeding of them due to the tardy arrival of the seed renders this year's test of but little value. They were all promising looking wheats with extra fine large heads, and the test will be continued.

Seed for plats 28 and 29, Eversaw and Oregon Red, was furnished by Hon. G. H. Brett, Ponca City, O. T., and they were tried on his recommendation. They have the indications of being very good varieties.

The seed for plats 30, 31 and 32 was furnished by the Kansas Experiment Station on request. Two of them, Zimmerman and Big Frame, have been grown at that station for a good many years and have given good results. The Crimean is a wheat very similar to the Turkey and was imported about five years ago from a district similar to the one from which the Turkey was imported some twenty years ago.

Turkey wheat is one of the hardiest and most universally grown of the hard wheats, and if a good strain of the seed is

obtained, it is a hard wheat to beat, taken one year with another. Its greatest drawback is that it is a little late in maturing and consequent tendency to rust.

It is true that a great deal of the Turkey wheat grown over the country now is run out, due to the use of poor seed, but where it has been graded and selected properly, the yield continues good. The U. S. Dept. of Agriculture has been distributing a very fine quality of Turkey wheat grown in Iowa. On the station farm, this gives no better yields than that from seed grown here. Plat 21 was planted with Iowa seed.

In Nebraska, where winter wheat freezes out a great deal, at the experiment station there, Turkey was one of the three varieties, in a list of over a hundred, that survived their severe winters. Big Frame was another of the three varieties. Like results have been obtained with these two varieties at the Kansas Experiment Station.

The yields of the varieties of the wheat grown at the Oklahoma Experiment Station for six years do not indicate that they are running out. At the Indiana Experiment Station, varieties grown there for fifteen years in succession give as high yields as the new varieties.

The station is often asked the question, "what variety of wheat has proven best?". Our experiments show that no one variety is greatly superior to all others, and that our list includes a number of most excellent varieties that do well under some very trying conditions, and if good strains of seed are procured it is not necessary to abandon them for new varieties in order to get better yields. In judging varieties by the yields it is best to take the average from a series of years. For the varieties grown at this station for six years, the average yields are given in table IX and ranked according to yield in each year and for the average.

TABLE IX.

*Varieties of Wheat Ranked According to Average Yields.*

VARIETY	1892-3		1895-96		1896-97		1897-98		1898-99		1899-00		Av. of 6 Yr's	
	Yield per Acre Bu.	Rank	Yield per Acre, Bu.	Rank	Yield per Acre, Bu.	Rank	Yield per Acre, Bu.	Rank	Yield per Acre, Bu.	Rank	Yield per Acre, Bu.	Rank	Yield per Acre, Bu.	Rank
Sibley's New Golden.....	5.3	7	27.3	2	51.0	1	20.2	6	27.2	2	44.5	1	29.2	1
Missouri Blue Stem.....	12.3	3	27.5	1	45.7	4	27.0	5	21.1	3	35.5	3	28.7	2
Fulcaster.....	12.0	4	23.3	3	40.7	7	28.5	4	27.2	4	38.5	2	28.7	3
Early Red Clawson.....	7.7	5	21.5	4	40.8	6	35.2	1	21.1	5	41.3	3	28.0	4
German Emperor.....	7.3	6	21.0	5	47.3	3	19.5	7	27.9	6	44.1	2	27.7	5
Fultz.....	14.7	1	15.1	6	47.7	2	33.4	3	22.9	7	39.3	4	27.0	6
Big English.....	14.0	2	10.6	7	41.0	5	34.5	2	20.0	8	37.7	7	26.3	7
Red Russian.....	4.7	.....	.....	.....	51.3	.....	30.0	.....	21.3	.....	41.3	.....	.....	.....
Early Ripe.....	.....	.....	15.4	.....	43.7	.....	18.4	.....	23.8	.....	40.1	.....	.....	.....
Pickaway.....	.....	.....	18.5	.....	46.0	.....	28.4	.....	29.3	.....	42.5	.....	.....	.....
New Red Wonder.....	.....	.....	.....	.....	.....	.....	25.7	.....	23.1	.....	41.3	.....	.....	.....
Turkey (Local).....	.....	.....	.....	.....	.....	.....	.....	.....	14.7	.....	42.1	.....	.....	.....

## SOIL MOISTURE IN WHEAT GROUND.

This one of the most important questions that the farmer has to think about in connection with the crop. Our soil is generally deficient in moisture in August and September and unplowed ground is hard and dry the greater part of the time. The sun will pump an inch of water that has fallen in the form of rain, from such ground in three or four days. On the other hand, plowed ground that is properly worked, will take in this moisture and retain it for weeks. It can be truly said that there never was a summer and fall so dry but that wheat could be put into the ground and would make a good crop if the ground had been prepared and cared for properly.

To ascertain the relative loss of moisture from early plowed and unplowed ground in this experiment, frequent determinations were made of the moisture present in the different plats, by a method used at experiment stations. Briefly; it consists of taking small samples of soil in the field where desired, by driving down tubes to the desired depth and cutting out cores of soil. The cores are weighed and then heated by artificial means until all the water is driven off and then reweighed to find the loss of water. The weight of water lost is divided by the weight of soil and the result is the per cent. of water contained in that soil at that time. If, at a certain time a soil was found to contain 15 per cent. of moisture and at another time later, the same soil contained only 10 per cent. and rain had not fallen in the meantime, we would say that this soil has lost moisture to the amount of 5 per cent. of its weight; that it contains 5 per cent. less moisture than it did in the first sample. Roughly, it may be said for the average soil, 1 per cent. of moisture in a cubic foot of soil, equals one seventh of an inch of water over a square foot of surface. Hence 5 per cent. loss would mean five-sevenths, or not quite three-quarters of an inch of water. Table X gives the results of moisture determinations made on the early, medium and late plowed plats at various times. Six soil tube samples were taken on every plat for each determination and mixed together and the sample for drying weighed out of this. The results of the plats are averaged in the table. In all except two cases the results are for soils

to the depth of twelve inches from the surface, and the exceptions are for samples taken from a point twelve inches below the surface to a point twenty-four inches below the surface.

TABLE X.

*Moisture Content of Soil Plowed Early, Medium and Late, and Unplowed.*

DATE OF TAKING SAMPLE	PLAT NOS.	TREATMENT.	DCPTH TAKEN IN INCHES.	PER CENT OF MOISTURE.	DIFFERENCE.
July 19.....	1 and 4.....	Early plowing.....	12	17.3	
July 19.....	2 and 5.....	Medium plowing.....	12	16.3	1.0
July 19.....	3 and 6.....	Late plowing.....	12	14.9	2.4
August 7.....	1 and 4.....	Early plowing.....	12	15.6	
August 7.....	2 and 5.....	Unplowed.....	12	10.0	5.6
August 7.....	3 and 6.....	Unplowed.....	12	10.4	5.2
August 14.....	1 and 4.....	Early plowing.....	12	18.5	
August 14.....	2 and 5.....	Unplowed.....	12	13.2	5.3
August 14.....	3 and 6.....	Unplowed.....	12	10.4	8.1
August 18.....	1 and 4.....	Early plowing.....	12	16.8	
August 18.....	2 and 5.....	Medium plowing.....	12	9.4	7.4
August 18.....	3 and 6.....	Unplowed.....	12	8.9	7.9
August 26.....	1 and 4.....	Early plowing.....	12	22.5	
August 26.....	2 and 5.....	Medium plowing.....	12	17.6	4.8
August 26.....	3 and 6.....	Unplowed.....	12	15.1	7.4
August 30.....	1 and 4.....	Early plowing.....	12	19.9	
August 30.....	2 and 5.....	Medium plowing.....	12	15.1	4.8
August 30.....	3 and 6.....	Unplowed.....	12	9.6	10.3
September 11.....	1 and 4.....	Early plowing.....	12	16.8	
September 11.....	2 and 5.....	Medium plowing.....	12	13.9	2.9
September 11.....	3 and 6.....	Unplowed.....	12	7.7	9.1
September 11.....	1 and 4.....	Early plowing.....	12-24	17.3	
September 11.....	2 and 5.....	Medium plowing.....	12-24	14.6	2.7
September 11.....	3 and 6.....	Unplowed.....	12-24	14.0	3.3
September 25.....	1 and 4.....	Early plowing.....	12	15.9	
September 25.....	2 and 5.....	Medium plowing.....	-12	12.7	3.2
September 25.....	3 and 6.....	Late plowing.....	-12	8.2	7.7
October 16.....	1 and 4.....	Early plowing.....	-12	12.8	
October 16.....	2 and 5.....	Medium plowing.....	-12	8.1	4.7
October 16.....	3 and 6.....	Late plowing.....	-12	7.3	5.5
October 16.....	1 and 4.....	Early plowing.....	12-24	16.1	
October 16.....	2 and 5.....	Medium plowing.....	12-24	15.0	1.1
October 16.....	3 and 6.....	Late plowing.....	12-24	15.5	0.6
November 15.....	1 and 4.....	Early plowing.....	-12	18.3	
November 15.....	2 and 5.....	Medium plowing.....	-12	18.3	
November 15.....	3 and 6.....	Late plowing.....	-12	19.4	1.1
March 25.....	1 and 4.....	Early plowing.....	-12	16.6	
March 25.....	2 and 5.....	Medium plowing.....	-12	16.6	.4
March 25.....	3 and 6.....	Late plowing.....	-12	16.6	.4
May 14.....	1 and 4.....	Early plowing.....	-12	8.6	
May 14.....	2 and 5.....	Medium plowing.....	-12	9.8	1.2
May 14.....	3 and 6.....	Late plowing.....	-12	9.8	1.2

NOTE: The plats are those used in the experiment detailed elsewhere in this bulletin.

In studying the results of the table the following points should be kept in mind.

I. The July 19th determinations were made before any of the plats were plowed.

II. Determinations given on dates of rain were made from samples taken after the rain.

III. There may be a variation from one to two per cent. due to the imperfect method of sampling.

IV. That every time a rain falls, it changes the water content of the soil and a determination made before a rain cannot

be compared with one taken after the rain without taking the rain into account.

The following table giving the daily rain record will be interesting to those who wish to make a close study of the results in the moisture table.

TABLE XI.  
*Rainfall.*

JULY		AUG.		SEPT.		OCT.		NOV.		MARCH		MAY	
Date	In's	Date	In's	Date	In's	Date	In's	Date	In's	Date	In's	Date	In's
1, 2, 3 & 4.....	.28	6	.21	10	.26	4&16	.10	14	.02	5	.45	1&2	.26
7.....	1.92	14	.83	17	.62	25	.65	17&18	.25	18	.03	15	1.77
8, 15, 16&17.....	.79	24	.11	.....	.....	26	3.40	19&20	1.38	22	.03	16&22	.43
19.....	.37	25	1.42	.....	.....	27&28	1.00	21&22	.15	.....	.....	24&26	.82
20.....	.76	.....	.....	.....	.....	.....	.....	23	.05	.....	.....	27&28	.43
29 & 30.....	.42	.....	.....	.....	.....	.....	.....	25&26	.10	.....	.....	.....	.....

Only a few of the interesting points brought out in this work will be taken up here.

Note that on July 19, all the ground contained a goodly per cent of moisture. On August 7th the plowed ground had 5 per cent. more moisture than the unplowed ground, which is equal to about three quarters of an inch of rain. On August 18th the difference in favor of the early plowed ground over the unplowed, was 6 per cent, on August 30th, 10.3 per cent, which is equal to about 1.45 inches of rain. On August 30th the unplowed ground was too dry to plow readily, and a rain of 1.42 inches had fallen five days before. When the moisture content of a soil gets down to eight or nine per cent, it is too dry to plow readily; and it should be noticed in the table, that with the exception of the times right after rains, the unplowed plats did not contain more moisture than 8 per cent, after July until the last of October. On the other hand, the early plowed plats had not less than 16 per cent at any time, except Oct. 16, and then it was 12.8 per cent, after a very severe drouth with a crop growing on the land, and at the same time the late plowed had only 8.2 per cent, a difference of about half. When the moisture content of the soil gets down to eleven or twelve per cent, the danger line is reached and seed germinates poorly and crops are retarded. September 11, three days before the date of seeding, the early plowed ground contained 16.8 per cent of moisture, the medium plowed 13.9 per cent and the late plowed only 7.7 per cent; 4.3 per cent less than the amount required to germinate wheat readily, while the early plowed contained 4.8 more than the required amount.

In table XII is given the moisture content of the ground on which the time of seeding experiment, detailed elsewhere in this bulletin, was situated. The places marked "Fallow," in-

dicates that the crop had not been seeded or was too small to make any difference.

TABLE XII.  
*Percentages of Soil Moisture of Land Containing Different Growths*  
FIELD E.

DATE	Plat No.	TREATMENT	Depth	Per Cent. of Moisture
Sept. 12.....	38-43.....	Fallow.....	0-12	9.6
Sept. 25.....	38-43.....	Fallow.....	0-12	10.1
Nov. 15.....	38-41.....	Early Sowing.....	0-12	16.8
Nov. 15.....	40-43.....	Fallow.....	0-12	17.8
Jan. 22.....	38-43.....	Composite.....	0-12	23.05
Mar. 25.....	38-41.....	Early Sowing.....	0-12	14.3
Mar. 25.....	39-42.....	Medium Sowing.....	0-12	13.3
Mar. 25.....	40-43.....	Late Sowing.....	0-12	15.3
May 14.....	38-41.....	Early Sowing.....	0-12	6.4
May 14.....	39-42.....	Medium Sowing.....	0-12	7.9
May 14.....	40-43.....	Late Sowing.....	0-12	8.6

Some of these results compared with those from the early and unplowed plats are interesting as the ground where these results were obtained was not plowed after the corn was removed but the surface given a thorough working with the disk. The results were better than if the ground had been plowed after the corn was removed.

In table XIII the percentages of moisture on the manured and unmanured plats, described elsewhere, are given,

TABLE XIII.  
*Percentages of Soil Moisture on Manured and Unmanured Ground.*  
FIELD D.

DATE	Plat No.	TREATMENT	Depth	Per Cent. of Moisture
July 19.....	1.....	Manured.....	0-12	18.7
July 19.....	2.....	Unmanured.....	0-12	17.3
July 22.....	1.....	Manured.....	0-12	21.9
July 22.....	2.....	Unmanured.....	0-12	20.8
Aug. 21.....	1.....	Manured.....	0-12	16.8
Aug. 21.....	2.....	Unmanured.....	0-12	17.0
Feb. 14.....	1.....	Manured.....	0-12	22.2
Feb. 14.....	2.....	Unmanured.....	0-12	21.0
May 25.....	1.....	Manured.....	0-12	14.7
May 25.....	2.....	Unmanured.....	0-12	15.4
May 14.....	1.....	Manured.....	0-12	9.4
May 14.....	2.....	Unmanured.....	0-12	12.6

The fact should be borne in mind that from February 14, the growth on the manured plats was much larger than on the unmanured. During May, the wheat on the manured plats was probably getting a great deal of its moisture from the soil below the surface foot as it did not show any lack of moisture, and the table indicates that there was not enough in the surface foot for it.

From these results we can not say that manured ground retains any more moisture than unmanured ground.