Northwest School News

Four issues published annually by the Northwest School of Agriculture, University of Minnesota, Crookston. Entered as second class matter. December 2, 1916, at the Post Office at Crookston, Minnesota, under the Act of August 24, 1912.

VOLUME XLIX Crookston, Minnesota, May - July, 1965 NUMBER 2

NORTHWEST SCHOOL FALL TERM OPENS OCTOBER 4

The Northwest School of Agriculture, Crookston, will open for the fall term on Monday, October 4.

Students who wish to transfer to the Northwest School for the Senior high school grades of 10, 11, and 12 should write to the Northwest School, Crookston, Minnesota, for information.

Through action taken by the Board of Regents of the University of Minnesota on March 19, the freshmen class at the Northwest School will discontinue commencing with the fall term of 1965.

OVER 300 ATTEND ALUMNI REUNION

A large number of alumni, former students, and faculty returned to the Northwest School campus on Saturday, June 19, for the annual summer alumni reunion. Over three hundred alumni were served at the "smorgasbord" supper held at 6:30 p.m. in the school Dining Hall. Following the supper hour, the alumni program and the business meeting of the Northwest School Alumni Association were held in Kiehle auditorium.

Celebrating its 50th anniversary was the class of 1915 with fifteen members of the class present for the reunion. Special reunions were also held by the classes of 1925, 1940, 1945, 1950, 1955, and 1960.

Presiding at the business meeting was Leo Ash of Orleans, president of the Northwest School Alumni Association. The traditional "alumni awards" were presented by E. N. Reiersgord of the Northwest School faculty. Receiving the prize for the oldest alumnus present was Lawrence Floan, '15, of Fertile, Minnesota; Mr. and Mrs. Eddie Hoeft (Margie Iwen, '55) of Vallejo, California, received the prize for coming the greatest distance; and Thomas A. McKenzie, '60, received the prize for being the most recently married graduate. He was married on April 3, 1965, to Pauline Estes of Neosha, Missouri.

A social hour, in Kiehle library, followed the alumni program and business meeting.

Present officers of the Northwest School Alumni Association are: Leo Ash of Orleans, president; Glen Finkenbinder of Crookston, vice presi-

(Continued on Page 4, Col. 3)

USING HAYLAGE AS A QUALITY FORAGE FOR DAIRY ANIMALS

BY G. D. MARX

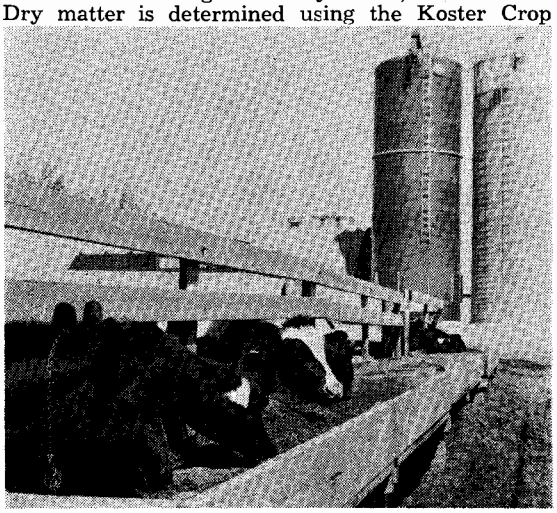
Haylage or low moisture silage can be defined as a grass or legume forage stored at a moisture content in the range of 30 - 50 per cent moisture. Dairymen and cattle feeders are showing a great deal of interest in haylage making and feeding and the farmers that have tried haylage have accepted and plan to use this quality forage.

The Northwest Experiment Station, Crookston, has used haylage for two years and will increasingly be using this crop in subsequent years. To date, this is the best forage we have used for feeding dairy animals. On the dry matter basis, the crude protein of this haylage is averaging 22.2 per cent which is three times more crude protein than in good corn silage.

Haylage was stored in both the cement stave and glass-lined oxygen-free silos. Both types of silos were effective in preserving the quality of the material. Several reports indicate that haylage can be stored in bunker and trench silos with a minimum of storage losses if packed properly to exclude air. In general, the quality of the material taken from the silo seems to be dependent on the quality of forage when it is ensiled.

One of the greatest advantages found using haylage is the ability to obtain top quality material for storage. Field losses and weather risks are greatly reduced over conventional haymaking methods. Our haylage making operation is planned so that the alfalfa is harvested at the bud to early bloom stage. At this stage of growth there is more energy or TDN per pound of hay than in the more mature stages of the hay crop which results in the animal consuming more energy per unit volume. The dairy animal has a limited capacity and when utilizing early-cut haylage more energy can be consumed by the animal which is very important in obtaining maximum milk production. The more energy we can feed a cow using forages, the greater will be our saving in dollars spent for concentrates and supplements.

One of our more critical problems, that of labor requirement, was greatly reduced when we shifted to making our first crop of hay into 40 per cent moisture haylage. The harvesting of this low moisture silage is completely mechanized from field to storage. The hay is cut, crushed and windrowed in one operation. Dry matter is determined using the Koster Crop Tester and hay is chopped (¼ to ⅜-inch theoretical cut) and ensiled at approximately 40 per cent moisture. On a good drying day, alfalfa hay can be cut in the morning and ensiled that same evening. Occasionally, part of the hay may become too dry because of limitations in the amount that can be harvested right at 40 per cent. In this event, hay is left in the field until the evening dew has developed and then ensiled. This method of ensiling minimizes loss of leaves which are the most important part of the plant in terms of feed value to the animal. Alfalfa stems contain less than half as much protein and minerals as do the leaves.



Dairy heifers grow rapidly and stay in top condition with high quality haylage as their only source of feed from 9 months old to calving.

(Continued on Page 4, Col. 3)

Northwest School News

Issued Quarterly by
THE UNIVERSITY OF MINNESOTA
NORTHWEST SCHOOL OF AGRICULTURE
B. E. Youngquist, Superintendent
Office
Northwest School and Exp't. Station
Crookston, Minnesota

Around and About With NW School Alumni

***News Regarding Northwest School Alumni, Former Students, and Faculty:**

***Mrs. Donald Overgaard (nee Harlene Hagen, class of '55) was honored at the Northwest School Alumni Reunion on June 19. At the close of the business meeting, she was presented a gift from the present faculty members of the Northwest School. Superintendent B. E. Youngquist made the presentation. Mrs. Overgaard has been a home economics instructor for the past three years at the Northwest School and recently resigned. She and her family are moving to St. Paul, Minnesota, to make their home. Her husband (Donald Overgaard, class of '55) will be employed in St. Paul.

***Donald Overgaard, '55, graduated from the University of North Dakota, Grand Forks, in June 1965, majoring in mechanical engineering. He has accepted a position in St. Paul, Minnesota.

***Drew Larson, '63, of Crookston, a student at Bemidji State College, was recently awarded a Dean's List Certificate for scholarship.

***Carol Ann Fehr, '63, of East Grand Forks, was one of 38 women students at the University of Minnesota, Minneapolis, to receive an award at a recent meeting at the University. She was elected to Chimes, a junior women's honorary organization.

***Raymond B. Hogenson, '25, was recently presented the Lambda Certificate of Merit Award of Alpha Gamma Rho Fraternity. He graduated from the College of Agriculture, University of Minnesota, St. Paul, in 1930. For a number of years, he has owned and managed the R. B. Hogenson and Company, Accountants and Auditors, St. Paul. His address: 1512 North Pascal, St. Paul, Minnesota.

***Claudia Hanson, '64, of Reynolds, N.D., is enrolled for Nurses' Training at the Wahpeton State School of Science and now affiliating at the Deaconess Hospital in Grand Forks, N.D.

FLOATING SLABS CARRYING THE LOAD

By E. C. Miller

Concern for what is holding up a building at its very foundation has been a problem over the centuries. Good advice was to build on "the rock," but if there isn't one around large enough — something else has to be considered. Common foundations over the years have been a footing type of construction which gave a snowshoe-effect at the bottom of the wall or column to distribute the load.

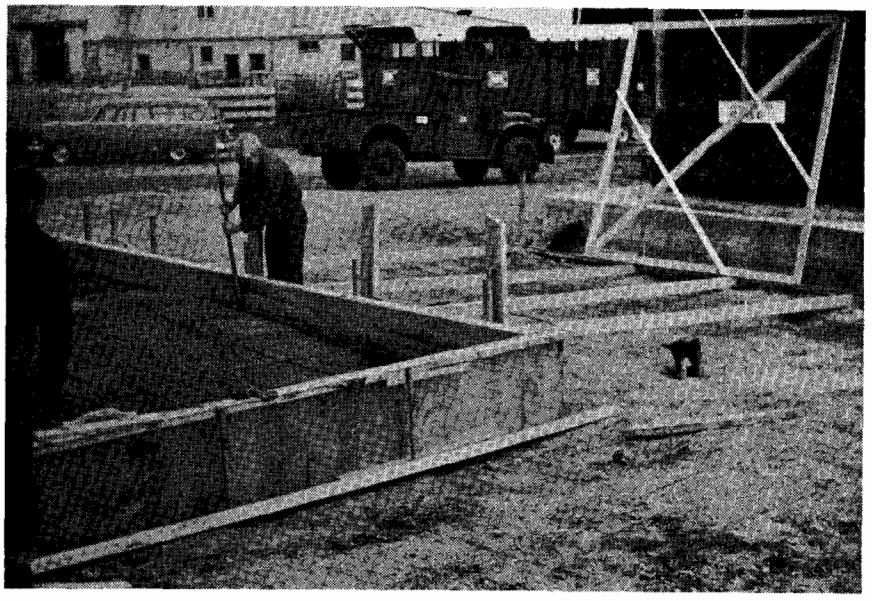
A floating slab as used at the Northwest Experiment Station, University of Minnesota, Crookston, is a design whereby rather than a small wide portion at the bottom of a wall or foundation, a whole floor is tied into the load producing structure and this broad area then carries the load and distributes it over a large area. Since a large area in the Red River Valley is underlaid with clay which absorbs water and then dries out in season, a heavy shift can take place with conventional footings and foundations under extreme wet or dry conditions. These shifts and settlements have a tendency to twist a building out of shape, spring doors, crack walls, and speed the deterioration of the building.

Very successful slabs have been worked out to carry the tons of silage which are piled into silos at the Northwest Experiment Station, Crookston. Grain storage buildings, garages, and barn additions are other areas where this principle has been applied. Many readers, no doubt, have seen the large office area at the Red River Valley Winter Shows building, or have actually "contributed to the load" on the concrete balcony there during the shows. This entire office area, with balcony above it, is riding on a reinforced slab which carries the load and also acts as the ground floor.

The success of a slab depends on calculation for the future load and it needs to be designed with enough concrete and steel to do the job. The cost of a properly designed slab is often somewhat higher than a conventional foundation; however, in the long run on these clay type soils, it has been found to be a saving since building costs and maintenance are high and grain and other feed storage can be lost.

In slab construction, one can expect minor shifting or settling; however, the secret to successful floating slabs—as with much other concrete work—is the uniform preparation of the site. A uniform base of pit run gravel makes an excellent site. All black soil and organic material should be removed first to a depth of three to four feet and the gravel packed down as it is built up into a well-drained site. If unusual clay, manure, or old refuse is encountered in the excavation, more

(Continued on Pg. 4, Col. 2)



Pouring concrete for a floating slab as a base for a 16' x 40' concrete stave silo. Two layers of reinforcing rod were used.

NORTHWEST EXPERIMENT STATION CONTINUES HAIL DAMAGE RESEARCH —

TRIALS CONDUCTED ON SIMULATED HAIL DAMAGE TO POTATOES

By B. C. Beresford

Two years of research has now been completed at the Northwest Experiment Station, Crookston, on simulated hail damage to potatoes. To complete the work, a third trial is being conducted in 1965. Hail often occurs during the growing season in the Red River Valley causing considerable damage to potato plants by defoliation of the leaves and mutilation to the stems. The trials are being conducted to determine the effect of applying simulated hail damage to potatoes at three stages of growth during the season—with four degrees of severity of damage. Potato plants were damaged with a hand flail three times during the growing season. There is need for data on per cent of yield loss when hail strikes at various stages of plant growth during the season and the effect of hail on market-grade size of plants sustaining damage.

The trials are being conducted with the potato variety Red Pontiac which is commonly grown in the Red River Valley area.

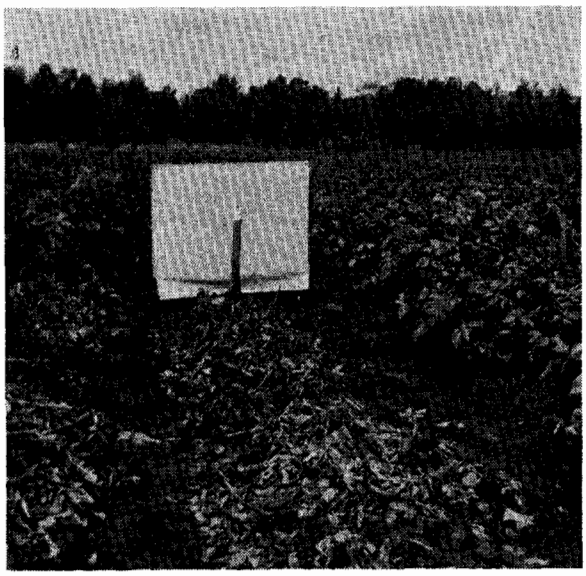
These plots were grown according to accepted practices for commercial production in the Red River Valley. Damage was applied first at the 50 per cent full bloom stage, next at the full bloom stage, and finally at 50 per cent past full bloom stage. At each stage of growth, 25 per cent, 50 per cent, 75 per cent, and 100 per cent damage was applied to each plant in each plot. A check plot (undamaged) was included in each stage of growth for each date of damage. Numbers and weights of tubers in size and grade classifications were made at harvest time. Specific gravity determinations were made from samples from plot.

After two years trial, data obtained shows the ability of the potato plant to make recovery from damage—varying from mild to complete defoliation, and still produce a high per cent of marketable yield, compared to the checks.

Yield reduction varied from 2 per cent with mild damage to a high of 66 per cent with complete defoliation. Yield reductions were greater when simulated hail damage was applied at full bloom stage and 50 per cent past full bloom stage than at 50 per cent of full bloom stage. At all three stages of growth, yield reduction was greater as the degree of damage increased. The greatest recovery from damage was made when the simulated hail damage was applied at the 50 per cent full bloom stage at all four degrees of damage inflicted.

A trend was noted in that the largest reduction in yield — from simulated damage — was caused by complete defoliation, but decreases in total yields and in the yield of No. 1 potatoes above two-inch minimum were observed at all four degrees of defoliation. The mild degree of damage reduced yields the least. Quality, as measured by specific gravity of the potato tuber, did not vary consistently with either degree of damage or stage of growth. Red Pontiac, the potato variety used for the trials, is a low specific gravity potato variety compared with most other potato varieties.

The surprising observation, of this writer, is the ability of the Red Pontiac potato to make recovery from the simulated hail damage — under the conditions of this trial — and have the yielding ability that it displays at harvest time.



Picture (to the left) was taken July 6, 1964 with potatoes at 50 per cent full bloom stage, moments after 100 per cent complete defoliation was inflicted with hand flail on Red Pontiac potatoes. Yield from this plot was 267 bushels per acre, compared to check plot of 535 bushels per acre.

Picture (to the right) taken July 16, 1964 showing recovery from 75 per cent severe defoliation inflicted with hand flail on July 6, 1964. The two year (1963, 1964) average for the same treatment was 371 bushels per acre compared to the check plot at 424 bushels per acre. Check plants are on the right and 75 per cent defoliation in the center.

BARLEY RESEARCH CONDUCTED AT NORTHWEST EXPERIMENT STATION

BY F. K. JOHNSON

The Northwest Experiment Station, Crookston, because of its location in the center of the barley producing area, plays an important role in the barley research carried on by the University of Minnesota. The major portion of the research program is directed and co-ordinated from the St. Paul Campus by Dr. D. C. Rasmusson, plant geneticist; Dr. E. E. Banttari, plant pathologist; and Dr. R. L. Glass, cereal chemist. The bulk of the testing beyond the usual varietal evaluation is carried on at the Northwest Experiment Station for any new variety, any pathological problem, or any malting quality characteristic that needs to be studied and adapted to this particular area. Research is also co-ordinated with neighboring states and provinces of Canada.

Primary objectives of the barley research program are to develop varieties which are not only higher yielders but that also have inheritant resistance to diseases and are of high malting quality. For example, in 1959, losses due to loose smut were estimated to be in excess of 1.5 million dollars in Minnesota alone. Research designed to combat this problem was initiated. The most advanced selection developed by Minnesota and now under regional evaluation carries genes which give resistance to loose smut. The most recent barley variety released in Canada (Conquest) is also resistant to loose smut and was developed from a similar program.

Leaf spotting diseases probably cause even greater damage to the barley crop. The 1955 epidemic of Septoria leaf blotch reduced the barley production that year by almost 25 per cent. The somewhat similar disease, Spot Blotch, is believed to be the most serious disease problem on barley. Many thousand of individual plant progeny in a number of different generations of development are evaluated yearly at the Northwest Experiment Station; only the best plants are saved for further testing. Rewards from the research on these barley diseases are forthcoming. Four of the five entries in the regional evaluation program from Minnesota carry some resistance to one or more of the leaf spotting diseases. North Dakota has just released the variety, Dickson, which carries such resistance. Of course, the newer selections always appear promising. If a new strain cannot prove to be superior to current varieties, it is discarded.

During your visit to the Experiment Station on Crops and Soils Day — July 13, or when you would like to drop in, you are invited to see these materials.

In addition to these areas of major research, a number of other problems are under investigation. These range from the determination of location of genes controlling specitic enzymes important in the malting process to the close-to-home problems of: (1) how to control barley protein yet get maximum yields, and (2) how late may the planting be, what seeding rates should be used and what are possible yields from late-seeded materials. Two areas of basic research are of special interest. One is an investigation of the potentials which might be offered from a true "hybrid" barley; the other is an evaluation of the selection exerted by nature on a composite of varieties from the world collection of barley when this composite is planted mid-June for a period of nearly ten years.

In short, the barley research at the Northwest Experiment Station consists of a great number of individual pieces of research, all of which are ultimately aimed at producing superior types of barley for this important barley-growing region. Problems most acute in the area are receiving the greatest attention, and yet the long-term developments necessary for the future are not being overlooked.

Floating Slabs Carrying the Load

(Continued from Pg. 2)

removal is necessary before building the site. Any settling on such a site is usually so uniform that no damage occurs and would probably be unnoticed unless checked with instruments.

The silo complex at the Northwest Experiment Station consists of four silos, each holding from 100 to 200 tons of silage depending on the nature of the material. Each silo rides on its own slab independent of the others so that stress does not occur when one is full and others empty or partially filled. An expansion joint sealed with an asphalt compound to prevent moisture from infiltrating at the joints is made between each slab.

Sealed (air tight) silos have their own drains; however, the slabs for conventional silos can have drains built in to relieve juices in excess of good silo practice.

Northwest School Honored for Service by Weather Bureau

The United States Weather Bureau has presented a 50-Year Certificate to the Northwest School and Experiment Station, Crookston, in recognition of service in maintaining "complete and legible records of accurate weather observations."

Dr. Olaf C. Soine, of the Northwest Experiment Station staff, has been the official observer since 1945.

The Weather Bureau State Climatological Office has extended congratulations to the Northwest School and Dr. Soine on the completion of 50 years of service to community and government.

In Minnesota, first-order weather stations are located only at Minneapolis, St. Cloud, Rochester, Duluth, and International Falls. Therefore, the Weather Bureau depends on the 200 cooperative meteorological stations in the state for observational weather information.

Weather data, as taken at local stations such as the one at the Northwest School, is used to determine such things as the length of the growing season, frost depth, climatic time and space changes, the growing and heating degree days, and frequency of severe storms.

Over 300 Attend Alumni Reunion

(Continued from Pg. 1)

dent; Mrs. Charles Holmquist (nee Bonita Vesledahl) of Crookston, secretary; and Mrs. Roger Tollefson (nee Barbara Thureen) of Beltrami, treasurer. Present officers are to serve until the summer of 1967.

Using Haylage for Dairy Animals

(Continued from Pg. 1)

Harvesting and storing of haylage requires more skill and adherence to proper timing and methods of handling than with conventional methods of making hay or grass silage. Greater attention to ensiling detail is required when this high quality forage is stored in the conventional storage than with the gas-tight storage, but properly made haylage is the best and most practical way to reduce harvesting and storage losses and preserve maximum feed value of the hay crop.

PRECIPITATION, FROST, AND AVAILABLE SOIL MOISTURE IN 1964 —

BY O. C. SOINE

Two local weather records were broken during the year of 1964; the earliest fall frost and the shortest growing season were both recorded at the Northwest Experiment Station, Crookston, according to official weather data.

A killing frost on field corn and garden crops occurred on August 13 which was the earliest fall frost on record for the period of 1910-1964. The previous record was on August 26, 1915.

The frost-free period of 74 days — from June 1 to August 13 — was also the shortest period on record. Even on June 4, the temperature dropped to 31 degrees but no damage was noted. The previous frost-free record of 78 days was also recorded in 1915.

The mean temperature of the year was 40.2 degrees as compared to 39.5 degrees for the long-time average.

The winter months of January and February were both nearly eight degrees warmer than usual but December was nearly nine degrees colder than the average. Six of the months were above the long-time normal and the remainder were below.

The highest temperature of 96 degrees was recorded on August 5, and the lowest reading of -26 degrees was recorded on December 26 and 27.

The total precipitation was 21.18 inches as compared to the 60-year average of 20.24 inches. The month by month distribution varied greatly — seven months were below and five were above normal in precipitation. The lowest monthly precipitation was 0.13 inches which was recorded during January and the highest amount was 4.47 inches during September. Even though the total precipitation was slightly above normal, an early spring and late fall drought had some adverse effects on crop production in this general area.

The snowfall for the calendar year was 51.5 inches, which amount was higher than usual. It had a water content of 3.10 inches. For 1963, the snowfall measured 23 inches and had a water content of 1.73 inches.

The following table gives the complete weather data for each month of the year compared to the 60-year average for precipitation and 50-year average for temperature.

WEATHER SUMMARY FOR 1964 WITH A 60-YEAR AVERAGE FOR PRECIPITATION AND A 40-YEAR AVERAGE FOR MEAN TEMPERATURE

	PRECIPITATION				MEAN TEMPERATURE	
	Snowfall Inch	Rain Inch	Total 1964 Inch	1900-1959 Yr. Av. Inch	1964 Degree	1910-1959 Yr. Av. Degree
January	6	0	0.13	0.56	12.8	4.8
February	7	0	0.26	0.61	16.0	8.6
March	11.5	0	0.72	0.82	18.8	23.4
April	7	1.51	2.67	1.52	43.3	41.5
May	0	1.57	1.57	2.64	58.6	54.5
June	0	5.25	5.25	3.34	62.2	63.7
July	0	2.19	2.19	2.91	71.2	69.8
August	0	1.76	1.76	2.95	64.8	67.3
September	0	4.47	4.47	2.04	57.1	57.1
October	0	0.46	0.46	1.36	45.7	45.1
November	5	0.87	0.93	0.89	29.2	26.8
December	15	0	0.77	0.59	3.2	11.9
Total	51.5	18.08	21.18	20.24	Mean 40.2	39.5

Frost Dates
June 1: 27°
August 13: 31° (killing frost on corn and garden crops)

WEATHER —
January - June 1965

The precipitation pattern for this year (January through June) has ben somewhat different than the comparable period for 1964, according to official weather data recorded at the Northwest Experiment Station, University of Minnesota, Crookston. A total of 12.27 inches of precipitation has been recorded for this period during 1965 compared to 10.60 inches for the corresponding period of 1964. The long-time average precipitation for January through June is 9.49 inches.

Another weather feature of this spring has been the cool temperature and lack of sunshine. March, April, and May each had 17 cloudy days; June had only 6 cloudy days. March and April had only 5 clear days per month while May and June had 9 clear days. The remaining days were partly cloudy.

The last frost was recorded on May 27 when the temperature dropped to 30 degrees.

The cool spring weather kept the frost in the subsoil longer than usual; and, as late as May 28, frost was still present at a depth of 48 to 54 inches.

Available Soil Moisture

The excessive rainfall that we have received this spring has moved into the subsoil and has helped to build up the available moisture supply. At the present time, the available moisture in the top five feet of soil is approximately nine inches. When completely saturated, this same soil will hold 17 inches of available moisture. However, this amount is not ideal for crop growth. For good crop growth, approximately nine inches of available moisture is considered most favorable.

On June 1, 1964, the available moisture was at an extremely low point and a drought seemed to be in the making. The available moisture in the top five feet of soil on this date was approximately five inches compared to approximately nine inches at the present time.

The largest supply of available soil moisture occurred on June 1, 1962, when 11.83 inches were measured.

The following table gives the average available soil moisture on three different fields on June 1 for the past four years:

Year	Available Soil Moisture on June 1 Inches
1962	11.83
1963	6.88
1964	5.21
1965	8.76

By Dr. Olaf C. Soine, Soil Scientist