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# El Niño Impacts Midwest Weather in 1998

Mark T. Carroll  
Meteorologist  
Murray and Trettel, Inc.

The following is the definition of El Niño, as stated in the *Glossary of Weather and Climate* (American Meteorological Society, 1996):

*Anomalous warming of surface waters in the eastern tropical Pacific; accompanied by suppression of upwelling off the coasts of Ecuador and northern Peru and heavy rainfall in the coastal regions of those nations. Because this condition occurs around Christmas, it is named El Niño (Spanish for boy child, referring to the Christ Child). In most years, the warming lasts only a few weeks or a month, after which the sea surface temperatures and weather patterns return to normal. However, when El Niño lasts for many months, more extensive ocean warming occurs, and weather extremes occur in widely separated regions of the globe . . . .*

Much more data concerning Pacific water temperatures, ocean currents, pressure patterns and wind currents are available than ever before. Sea surface temperatures recorded in the eastern Pacific during the fall and early

were fairly consistent with those observed during the 1982-1983.

Much of the weather experienced by the United States in 1998, and in particular the winter season of 1997-1998, was as predicted by those following El Niño trends.

Portions of the United States have fairly well-defined weather patterns during strong El Niño years. For example, from California to Texas to Florida, one might anticipate precipitation totals of as much as 150 to 200 percent above normal during the winter season and into early spring (this was certainly experienced in certain southwestern and southern regions during early 1998).

The far west, northwest and northern tier of states from Washington to New York would anticipate above normal temperatures from December through February, as well as below normal precipitation (this too was experienced during the 1997-1998 winter season).

*(continued on page 14)*

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*Because this condition occurs around Christmas, it is named El Niño (Spanish for boy child, referring to the Christ Child).*

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winter of 1997 were the highest observed over the past 50 years.

Until the 1997-1998 El Niño event, the 1982-1983 event was the strongest of the century. Global weather occurrences from winter 1997-1998 into spring of 1998



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Attempts to link El Niño to Midwest winter weather have not been as successful as other regions of the United States. Strong El Niño events (where Pacific water temperatures are much above normal) seem to provide a better correlation with Midwest winter weather than do weaker El Niños.

Summer weather is much more difficult to predict based on El Niño events. Many (not including Murray and Trettel) had predicted a very hot and dry summer for the Midwest during 1998. This was not the case. Temperatures were slightly above normal in Chicago during the summer months (June through August) and precipitation was slightly below normal, however, not to the extent predicted by many.

As an example of the impacts of El Niño on the Midwest, we need to look no further than Chicago, Illinois. The following are temperature and precipitation departures from normal from December 1997 through August 1998.

**DEPARTURE FROM NORMAL**

(Temperature in degrees Fahrenheit, Precipitation in inches)

MONTH	TEMP	PRECIP
Dec '97	+4.9	-0.97
Jan '98	+8.6	+1.05
Feb '98	+13.3	+0.34
Mar '98	+1.7	+1.60
Apr '98	+1.2	-0.08
May '98	+5.9	-0.30
Jun '98	+0.7	-1.14
Jul '98	+1.3	-2.28
Aug '98	+1.8	+2.26

Temperatures experienced during January and February were extreme. Over the past 30 Februarys, February 1998 was the warmest. In the last 30 years, only two Januarys were warmer than

1998: 1989 and 1990. One must realize that the average temperature of February being more than 13 degrees above normal actually refers to the temperature being an average of more than 13 degrees above normal on a **daily** basis for the 28 days of the month.

Temperatures became much closer to normal during the spring and summer in Chicago (with the exception of May which was nearly six degrees above normal);

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*Summer weather is much more difficult to predict based on El Niño events. Many had predicted a very hot and dry summer for the Midwest during 1998. This was not the case.*

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however, in no month were the temperatures ever below normal.

For the first eight months of 1998, precipitation was above normal. The months of January and February 1998 and above-normal precipitation. During a winter with normal temperatures, snowfall would have been expected to be above normal during those two months. Because of the very mild temperatures, however, much of the precipitation that fell, especially during February, was in the form of rain, not snow.

A study performed by Ken Kunkel, director of the Midwestern Climate Center, found a reduction of winter snowfall in the Midwest and Great Lakes regions

during eight strong El Niño events from 1951 through 1996. The research showed a reduction of winter snowfall of 5 to 15 inches throughout much of the Midwest during strong El Niño events. Also, snowfall during the strongest El Niño winters was more than 15 inches below normal within the lake-effect snow belts of Lakes Superior, Michigan, Erie and Ontario. The below-normal snowfall in the Midwest during the 1997-1998 winter was consistent with previous strong El Niño episodes. Chicago's 1997-1998 winter snowfall was nearly 8 inches below the 30-year normal.

We are currently entering a La Niña period where Pacific water temperatures are below normal (the opposite of El Niño). The linking of anticipated weather in regions of the United States to La Niña episodes has not been very successful. Many feel the Midwest is likely to experience a "normal" winter. Because of the relatively mild winter weather experienced by the Midwest over the past years, a "normal" winter may be perceived by some as being extreme (cold with heavy snowfall)

The following are normal temperatures, precipitation and snowfall for Chicago, Illinois, for the winter months of December, January and February:

	DEC	JAN	FEB
Maximum Temp	34.0°	29.0°	33.5°
Minimum Temp	19.1°	12.9°	17.2°
Daily Mean Temp	26.6°	21.0°	25.4°
Precipitation	2.47"	1.53"	1.36"
Snowfall	8.30"	10.40"	8.20"





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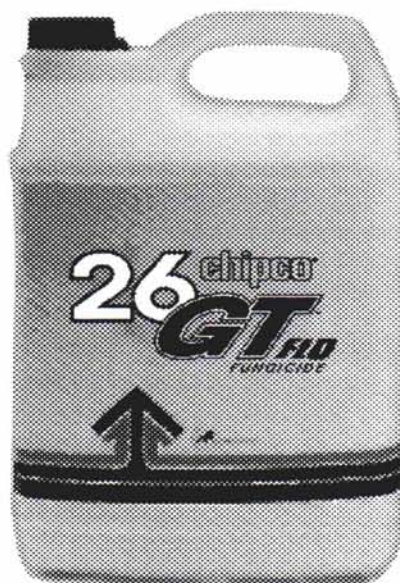


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# Winter School for Greenkeepers at Massachusetts Agricultural College

*Editor's Note: This is another article in the continuing series that appeared in early editions of The Bulletin of the United States Golf Association Green Section. This month's article appeared in Vol. 10, No. 6, June 1930, and is the first college to offer classes for greenkeepers—very interesting reading.*

Lawrence S. Dickinson  
Massachusetts Agricultural  
College, Amherst, Mass.

The Massachusetts Agricultural College, at Amherst, was the first college in the United States to offer resident courses of instruction for greenkeepers, and at present is the only institution carrying the course for a full term. This course was first proposed by the writer, in 1926, and accepted by the short-course department of the college the same year. Seven men registered for the first course on January 3, 1927. Succeeding courses have been oversubscribed, and as many as 40 applicants have been refused admission to a single course.

Every phase of greenkeeping is touched upon in the course and each factor governing results is discussed. The course is a specialized one for men engaged in greenkeeping and for members of green committees. The subjects included in the course can be effectively studied during the winter months.

The duration of the course is about eleven weeks. Registration is the first Monday in January and the term ends about March 20. The last few days are devoted to an exhibition and convention. Four hundred and fifty greenkeepers and their chairmen attended the 1930 exhibition.

## The geographical distribution of member students during the four years the course has been presented is as follows:

State	1927	1928	1929	1930
Canal Zone				1
Connecticut			2	
Illinois	1			1
Indiana			2	
Iowa				
Kentucky			1	2
Maine				1
Massachusetts	5	16	9	9
Michigan				1
Minnesota				
New Hampshire				1
New York				1
Ohio			1	1
Pennsylvania				2
Vermont	1			
Total Students	7	16	15	20

No entrance examinations are required, but it is expected that the student will have a reasonable execution in the English language.

The number of students is now limited to 20 and applications are accepted in the order of their being filed provided the applicants are actual greenkeepers. Preference is given to greenkeepers and green-committeemen. Two applications have been accepted for the 1932 course. Certificate is given to those who completed the full course with credit.

There is a tuition fee of \$10 for the term, and each student is required to pay to the treasurer a \$5 registration fee in addition. No laboratory fees are charged. Board may be obtained at the college dining hall for approximately \$7.50 a week, also from private dining rooms. Furnished rooms may be obtained in private houses at prices varying from \$2.50 to \$4 a week for each occupant.

Instruction is given seven hours a day and five days a week, and in addition the hour after lunch is given over to a forum discussion or to talks by visitors. Representatives of the leading commercial houses, as well as greenkeepers, are frequent visitors.

## A description of the courses follows

- I. **Landscape Background.**—Planting and pruning of shrubs and trees. Shrubs for club house grounds and the use of native shrubs and natural landscape resources. Paths, walks, and picking gardens are also discussed.
- II. **Water Systems.**—A study of standard types of water systems, with particular reference to the relation of size of pipe, pressure, and nozzles to the flow and delivery of water.
- III. **Soils and Fertilizers (special for greenkeepers).**—Funda-

*(continued on page 18)*

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mental properties of soils, and their management, as related to golf green conditions, will constitute the main part of the course. The study of fertilizers and their uses will be made as complete as possible. Individual problems and discussions will be given as much time and attention as are warranted.

**IV. Equipment.**—All equipment used in golf course maintenance is considered. A particularly thorough study is made of mowers (fairway, rough, tee, and putting green) and other major equipment. Practical efficiency data are obtained and studied. The results can then be applied to the student's individual problem.

**V. Managerial Problems.**—This course uses for its laboratory a very large and complete model of a golf course, about which the many problems of a greenkeepers are discussed. The model is so complete that the discussion is practical and not of a theoretical nature. The problems are not merely discussed, but figured and balanced to a conclusion both as to immediate results and cumulative effects.

**VI. Grasses and Grass Seed.**—This course enables the student to identify the various grasses, also grass and weed seeds usually found in seed mixtures. The soil and fertilizer requirements of the various grasses are discussed. Emphasis is placed upon seed judging and purchasing; also pests and turf diseases and their control.

**Courses Offered**

Courses	Weekly Periods	Length of Course	Instructor
Landscape background	1 Lecture	Full term	F.A. Waugh
Botany	1 Lab, 2 Lectures	Full term	W.H. Davis
Water systems	2 Labs, 3 Lectures	Six weeks	C.I. Guinness
Drainage	2 Labs, 3 Lectures	Five weeks	M.J. Markuson
Equipment	3 Labs, 2 Lectures	Six weeks	L.S. Dickinson
Managerial problems	3 Labs, 2 Lectures	Five weeks	L.S. Dickinson
Grasses and grass seeds	3 Labs, 2 Lectures	Six weeks	L.S. Dickinson
Cost keeping and analysis	3 Labs, 2 Lectures	Five weeks	L.S. Dickinson
Soils and fertilizers	2 Labs, 2 Lectures	Full term	M.H. Cubbon

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**VII. Drainage.**—The entire problem of land drainage will be discussed and practical problems worked out. The student will be taught the use of the level and how to set ditch grades.


**VIII. Botany for the Greenkeeper.**—Laboratory demonstrations and lecture discussions dealing with the living plant and its parts and consideration of the work performed by each part.

**IX. Cost Keeping and Analysis.**—The value of cost keeping and its analysis is demonstrated and a method of cost keeping suggested. The many factors that enter into the cost of maintenance are noted and their effects analyzed. As much emphasis is placed upon remote and cumulative costs as upon the immediate expenditure.

**X. Forum and Special Lecture Hour.**—The course has become so popular that a day seldom passes without a visit from some practical greenkeeper, green-committee chairman, or a representative of some commercial house.

The forum hour is for the purpose of having an informal and confidential discussion with these visitors. The interest and cooperation shown by commercial houses is most gratifying. Their representatives very seldom appear as salesmen. They come to give information about their part in golf course maintenance. This hour makes the course a continuous convention.

In 1931 the climax in the course will probably take place in the form of a convention, with more time being given to an educational program than in past years. This does not mean that there will be no exhibition, but that exhibits will be supplementary. The exact dates of this convention, together with program, will be announced later. All green-committee chairmen, greenkeepers, professionals, and others interested in turf maintenance are invited.

Further information may be obtained by those interested in future courses by addressing either Roland H. Verbeck, director of short courses, or the writer, at Massachusetts Agricultural College, Amherst, Mass. 





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# 1998 Hayter International Cup

Al Pondel  
Deerfield G.C.

During the week of October 11 through the 16, I went to Atlanta as one of twelve superintendents to represent America's Team (AME) in a three-day competition against twelve golf course superintendents from the Rest of the World (ROW). The invitation was a result of my victory in last year's national tournament. The format of this biennial event resembles the Ryder Cup matches where you play four-ball (best ball) the first day, foursomes (alternate shot) the second day and then singles matches the final day. The courses we played were the Atlanta Athletic Club, site of the PGA in 2001; Peachtree Golf Club, previous site of the Walker Cup; and White Columns Golf

Club. We also were fortunate to play the Golf Club of Georgia and Cherokee Country Club the two days preceding the competition. The golf courses we played were in superb condition, and the hospitality shown us by the clubs was first class. I am happy to report that our team was victorious 13.5 to 10.5.

The 12 superintendents from the ROW's team were from England, Ireland, Scotland, Wales, France, Spain, Finland, Norway, Sweden, Switzerland, Germany and Australia. The superintendents from AME's team were from Argentina (2), Canada (4) and the United States (6). The matches were very competitive, but when the round was over, we really got to enjoy the company of these guys. Interestingly, all of

(continued on page 22)

Match	Players	Team	Result	Points AME	Points ROW
No. 1	Piller VS. Kauler	AME ROW	6+5		1
No. 2	Mangum VS. Lewis	AME ROW	2 up	1	
No. 3	Witt VS. Sternberg	AME ROW	5+4		1
No. 4	McGinnis VS. Sheehan	AME ROW	3+1		1
No. 5	Alarie VS. Eriksson	AME ROW	8+6	1	
No. 6	Baden VS. Hansen	AME ROW	3+1	1	
No. 7	Pondel VS. Dorbeau	AME ROW	8+6	1	
No. 8	Seuss VS. Webber	AME ROW	1 up	1	
No. 9	Young VS. Frewin	AME ROW	1 up		1
No. 10	Fearis VS. Ambresin	AME ROW	7+5		1
No. 11	de Udaeta VS. Rezola	AME ROW	Halved	1/2	1/2
No. 12	Meyer VS. Wilson	AME ROW	4+2	1	
Singles Team Totals				6 1/2	5 1/2



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