Nebraska Climate Education and Extension Project (CEEP)
And Its First Workshop

What is it?

The CEEP is a project with duel objectives:

1) To increase Nebraska agricultural producers' knowledge and understanding of weather and climate, and
2) To increase their applications of climate and weather information and products to improve planning, reduce climate risks, and benefit production.

Who are we, and what do we do?

The CEEP committee is a group of researchers and extension personnel of the University of Nebraska Extension, who will organize education and training workshops and classes to 1) update the knowledge of weather and climate and climate change in Nebraska, and 2) provide and demonstrate application methods of climate and weather information and products to Nebraska agricultural producers. This group strives to bring easy access and working tools to the producers and improve their production. The CEEP committee currently includes Q. Steven Hu, Kenneth Hubbard, William Waltman, Roger Selley, James Stack, Andrew Christiansen, Keith Glewen, William Kranz, Gary Hein, and Dean Yonts.

Why do we do it?

Scientific background:

Although no consensus exists on how many Nebraska agricultural producers have been using or want to use weather and climate information and products in their season planning and daily work, everyone, in general, agrees that weather and climate is critical in almost every aspect and procedure of agricultural production. In the middle of the growing season, for example, we will not apply nitrogen fertilizer to corn if we know the next couple of weeks are going to be dry and hot, because the fertilizer will harm corn growth in such a weather condition. In another example, we will cut the grown hay earlier and bail it out the field if we know the rain is on its way. Countless such examples demonstrate that climate and weather set the conditions for the existing as well as future farming technologies and procedures to function properly. They also indicate that we can maximize the effect of technology and the benefits from our work if we know how to find and use appropriate climate and weather information and products in our planning and operation.

It is true that we face many obstacles when attempting to find and use climate and weather information. The major one is the uncertainty in accuracy or reliability of weather and climate forecasts. They are not 100% accurate; and when they fail, they bring consequences to the outcome of their applications. This uncertainty will always be a factor in our decision process. However, a good news is that serious effort and increasing investment have been given to reduce this uncertainty, and they have resulted in a higher

success rate of the forecasts in the recent years. Now, the probability of seasonal forecasts has an average success rate of about 60%. As a supporting example, in 1997, the first forecast of El Nino was successfully made. It was widely used and benefited agricultural producers and resource managers across the nation in many significant ways. The success rate of daily and weekly forecasts is even higher, as shown in this following story. In his February 14 announcements of Clear Skies & Global Climate Change Initiatives, President Bush told his audience at NOAA-National Oceanic and Atmospheric Administration, who makes the nation's official weather and climate forecasts, that "I also want to tell you one of my favorite moments was to go down to Crawford and turn on my NOAA radio to get the weather. I don't know whether my guy is a computer or a person. But the forecast is always accurate, and I appreciate that."

In order for us to feel more confident to use the constantly improving climate and weather forecasts and products in agricultural production, we have to overcome another obstacle, that is, how to cope with individual failed forecasts and not be overwhelmed by its negative impact. We can gain an understanding of how to do it by looking at how we have responded to the other uncertainties involved in agricultural decision and operation.

Like climate and weather forecasts, almost every technology or procedure in agricultural production has its uncertainty of various magnitudes. For instance, a kind of corn seed has its germination and emergence rate about 90%, and pesticide or herbicide only affects a certain percentage of targeted objects. We hardly complain they do not reach 100% efficiency, because, after years of applications, we have accepted such uncertainties and developed ways to make up the shortfalls from their deficiency. In years when we had poor emergence rate, we would either replant or plant a different crop depending on how far we were into the growing season; when the first application of a chemical did not work well we repeated its application. These uncertainties from using the seeds or chemicals are comparable to that from using seasonal and weekly forecasts and related products. But because we have not used the forecasts as frequently or routinely as we have done with the seeds and chemicals, we have a blank knowledge of how to deal with forecast problems in our operation. In addition, because the weather and climate is unrepeatable in a season, we have to deal with the inaccurate forecasts in ways different from what we do with the seeds and chemicals problems. Unfamiliarity with these necessary coping methods has slowed us in applying climate and weather forecasts.

In fact, some methods that use seasonal forecasts and also minimize impacts of forecast inaccuracy have been proposed and applied, including mix of hybrid seeds for a season among high and low water usage and yield, and diversifying farm operation to include either forage production or farm animals. For short-term forecasts problems, we can repeat an operation. For example, in case a predicted rain does not happen we can irrigate the field (if it happens we make saving of resources). Routinely applying climate and weather forecasts along with these and other methods that cope with limited accuracy of the forecasts, we can develop effective operation strategies to maintain a steady and high productivity in the changing environment. Moreover, because the workload and investment in applying the forecasts in these operations are not more than those that use no forecasts, the reward and benefits from using the forecasts and relevant operation strategies are obvious.

How do we do it?

So, if we can improve producers' understanding of climate and weather forecasts they will have better confidence to increase applications of, or develop their own, farming strategies that take the advantages of the seasonal and short-term forecasts. The CEEP project will work, through various means, with the extension personnel and agricultural producers to provide available or new weather and climate forecasts, from seasonal (El Nino/La Nino) to weekly time scales, and climate products useful for Nebraska, and to assist development of farming strategies that will sustain the profitability of Nebraska's agriculture.

The first CEEP workshop:

The first one-day CEEP workshop will be on April 19, 2002 at the University of Nebraska-Kearney Campus at Kearney, Nebraska. A goal of this workshop is to introduce major resources of weather and climate forecasts and products that can be used and illustrate by examples how these resources have been used by Nebraska producers. This workshop will outline the context of CEEP project, and will start CEEP to continue providing new information of climate and weather forecasts and methods of using them in agricultural production.

Workshop Agenda

(8:00am – 4:30pm, April 19, 2002, UNK Campus)

8:00-8:10am: Welcome (Dean of Earth Sciences, UNK)
8:10-8:25am: Opening remarks: "That easterly wind" (Steve Hu, CEEP Committee)

8:25-9:10am: Climate forecasts and their interpretation (Steve Hu, Assistant Professor, Agricultural Climatologist, SNRS, UNL)
9:10-9:25am: Question exchange

9:25-10:15am: Nebraska weather monitoring network (AWDN) and its products (Kenneth Hubbard, Professor, SNRS, UNL)
10:15-10:30am: Question exchange

10:30-10:45am Coffee break and registration

10:45-11:30am: An example of weather data application in irrigation scheduling (Steven Melvin, Extension Educator, Frontier County, NE)
11:30-11:45am: Question exchange

11:45am-1:00pm: Workshop luncheon

1:00-1:30pm: An example of weather/climate data application in management of Alfalfa production (Dr. Bruce Anderson, Professor, Agronomy, UNL)

1:30-1:45pm: Question exchange

1:45-2:30pm: Strategies of reducing adverse weather impacts on Nebraska agricultural production (Mr. Mark Svoboda, Climate Specialist, National Drought Mitigation Center)
2:30-2:45pm: Question exchange

2:45-3:00pm: Coffee break

3:00-3:30pm: Integrating climate information in agriculture resource management and planning (Dr. William Waltman, Research Coordinator, Conservation and Survey Division, UNL)
3:30-3:45pm: Question exchange

3:45-4:15pm: El Nino of 2002 and an outlook of its effect on Nebraska's spring and summer rainfall (Steve Hu, SNRS, UNL)

4:15-4:30pm: Summary and future plan (Steve Hu, CEEP Committee)

4:30pm: Adjourn

Future plan:

CEEP plans to organize future annual workshops to introduce new climate and weather products and demonstrate new methods that use climate information and products to benefit Nebraska agriculture. CEEP will publish short articles to increase climate education and address issues related to climate forecasts and their application. It will seek opportunities to develop courses to update agricultural consultants' knowledge of weather and climate and climate change to raise their awareness and application of climate information and products.