University of California
Agriculture and Natural Resources
Making a Difference for California

Using Manure Nutrients for Crop Production
University of California Cooperative Extension
Stanislaus County

Crop Nitrogen Uptake Calculator Instructions

1. Enable Macros

When the file first opens, be sure and enable the macros by clicking the "options" button. If you forget, you will need to close the file and then re-open it.

After you click the "options" button, you will be given the option to enable or disable macros. Enable the macros and press okay. If you downloaded the program directly from the manure.ucdavis.edu, the file will not harm your computer.
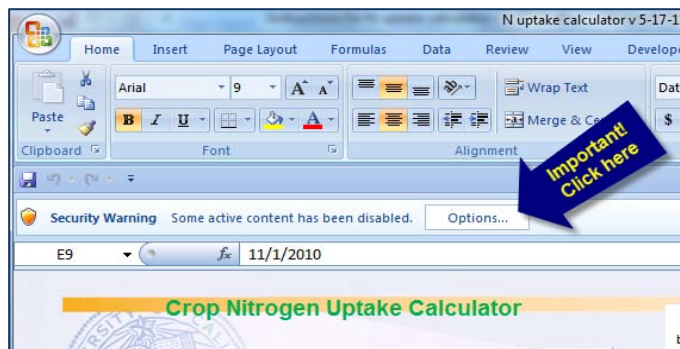
2. Fill in planting and harvest dates for each crop.

   If dates are in the wrong order or are missing, the calculator will display errors instead of uptake numbers. Make sure that the next planting date doesn't precede the prior crop harvest date and also check that the years are correct.

3. Enter the amount of nitrogen uptake expected in pounds per acre.

   Tons per acre of silage @ 70% moisture x % protein x .96 = lbs of nitrogen per acre

   Tons of hay @ 10% moisture x % protein x 2.88 = lbs of nitrogen per acre

   For winter forage and triplecrop sudan grass, enter the expected irrigation dates in the spaces provided.
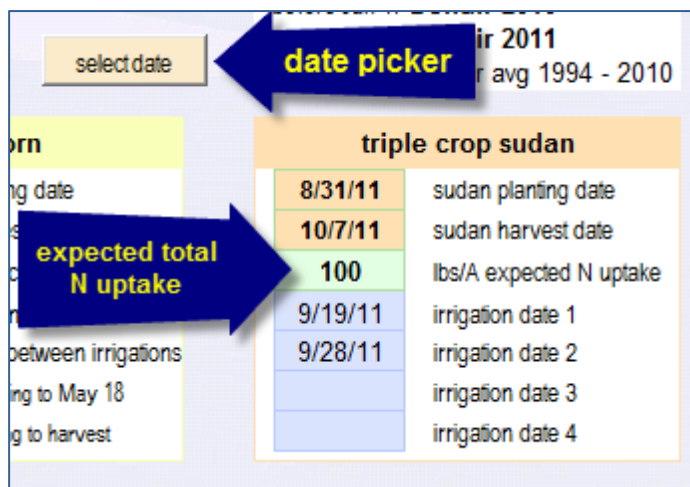
For corn, enter the date of the first crop irrigation and the average number of days between irrigations.

4. Select a winter forage growth pattern type, based on when the peak uptake occurs. Use the sample charts below to pick the growth pattern most similar to the type of cereal forage you have. These charts are in pounds of nitrogen per day taken up by a crop planted November 1 and cut April 18.
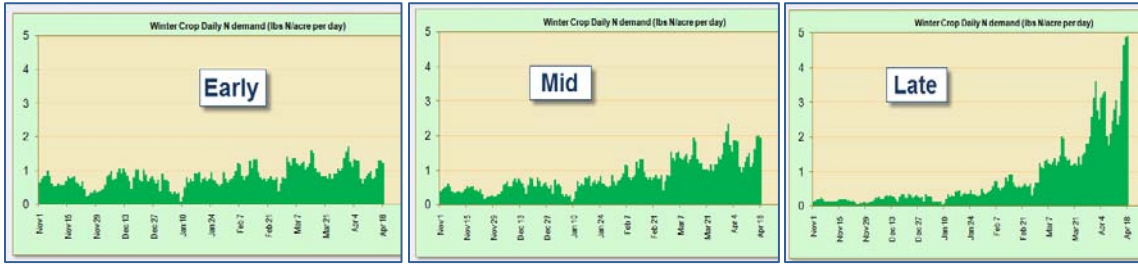
5. Press the "weather data" button and choose the weather data to use from the list. The weather data itself is stored in the "minmax" tab. Update or add new temperature data from that page. When you have selected the desired weather years, press "okay".
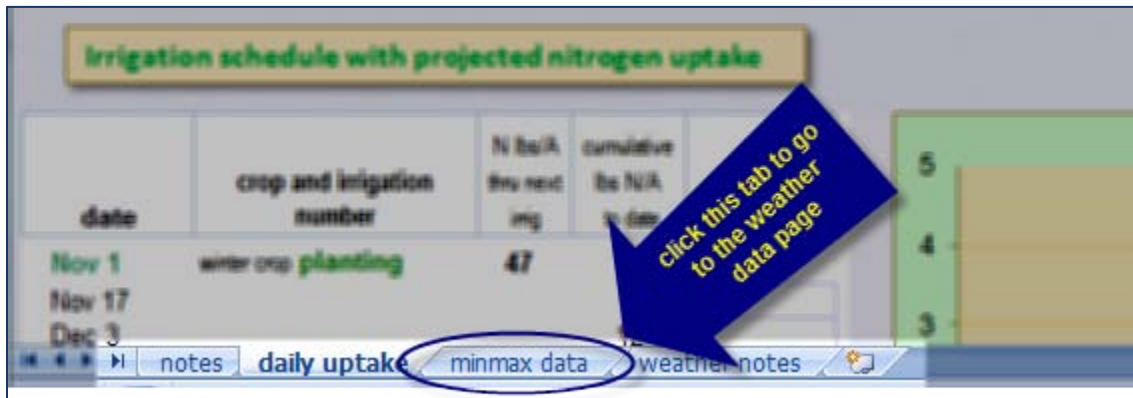
6. Scroll down to see the nitrogen uptake by irrigation interval or by cumulative to date. The winter crop has extra dates so that crop progress can be monitored during the longer periods where there are no irrigations. The calculated irrigation dates can be adjusted by entering a different date in the "adjust date" column of the projected nitrogen uptake table.
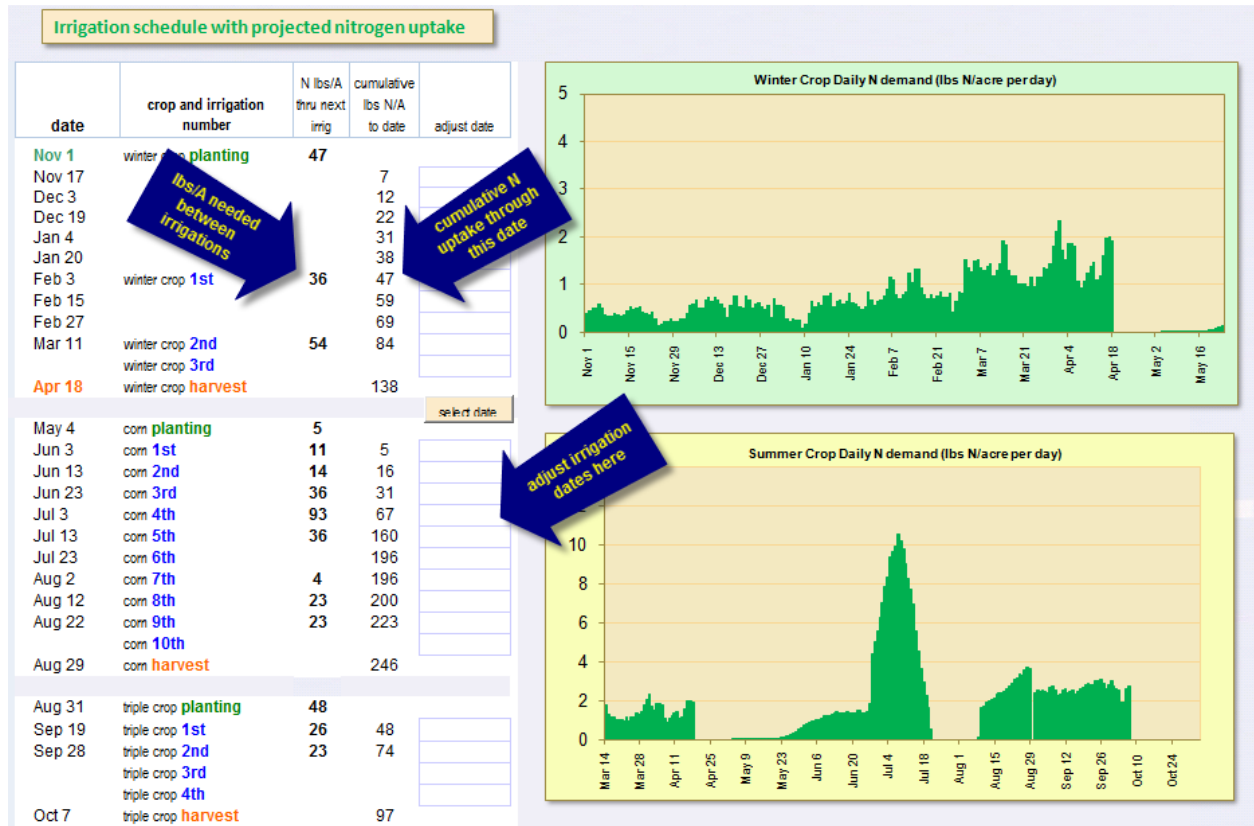
7. View the corn GDUs to date or to harvest. If desired, choose a new harvest date that will match the GDUs of the corn variety you planted. The default cutoff maximum for corn has been set to 95 $^{\circ}$F instead of 86 $^{\circ}$F which is used in the Midwest corn growing regions. It is felt that under well-irrigated conditions, corn is able to continue to grow at higher temperatures. This cutoff can be adjusted by pressing the "weather data" button, and choosing the "Min Max Cutoff" tab on the popup menu. Please tell us how well your custom or default minimum or maximum cutoff temperatures match your observed crop progress.
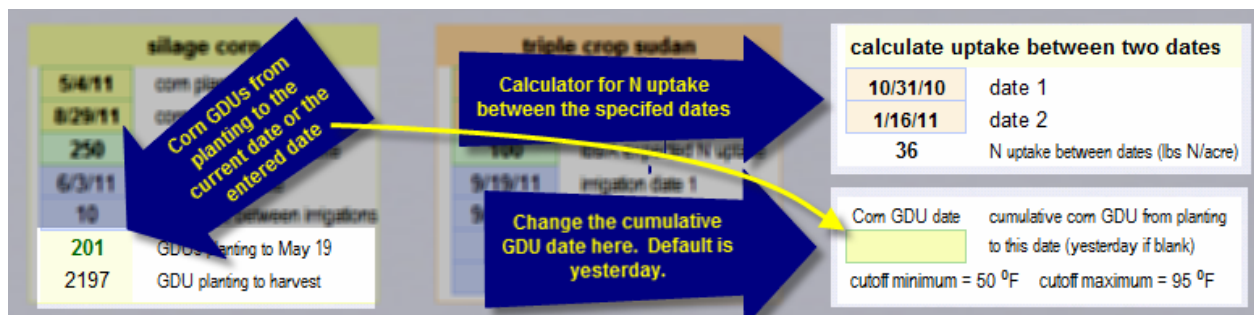
8. The temperature data does NOT automatically update. You will need to enter daily minimum and maximum temperatures if you want to have information for this year.
Select the "min max data" tab and scroll to the desired year.

The nitrogen uptake model does not use precipitation or soil temperature data. However, the nitrogen mineralization and real-time field nitrogen budget models that are being developed by UC will require this information.

IMPORTANT: Use this model to manage crop nitrogen at your own risk! Biological systems are far too complex for any model to be 100% accurate; never rely solely on a model when making management decisions. Please share your observations of how well this model seems to be predicting - or not predicting - your crop situation. We are relying on real-life feedback to continually refine and adjust this tool.

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