

Final Report

Arizona Grain Research and Promotion Council

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Wheat and barley growth stage and water use calculator

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# Wheat and barley growth stage and water use calculator

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## Summary

The Arizona Grain Research and Promotion Council for many years funded the Small Grain Advisory, a bi-weekly newsletter of wheat and barley growth stage and water use. The Small Grain Advisory was useful but was static and the recipient could not tailor the report to his own conditions. A wheat and barley growth stage and water use calculator was conceived and developed that allows the user to obtain growth stage and water use based on planting date, variety, and weather data from the nearest AZMET location. This calculator also provides an irrigation schedule with the additional input of last watering date, soil type, and intended irrigation frequency. The user can select past, current, or next year and the crop calculator will use actual weather data from the past or average weather data for the future. The Crop Calculator works with cell phones, tablets, and computers.

## Description

The wheat and barley Crop Calculator can be accessed at <https://cals.arizona.edu/cropcalc>. The home page screen includes tools for growth stage, water use, irrigation schedule, and yield prediction (Fig. 1). The yield prediction tool is not currently active, but may be in a future version. When the user clicks on Growth Stage, a menu appears that asks to update “Crop properties”, a pseudonym for crop properties (Fig. 2). Crop properties include crop (barley, durum, or wheat), variety, planting date, and nearest AZMET station. After submitting the updated Crop properties, a calendar of growth stages appears for the entire season. A screen shot of the first two of 21 stages is presented in Fig. 3 assuming the crop is durum, the variety is “Average”, the planting date is 15 December 2016, and the nearest weather station is Maricopa. If the user were to return to the home page and then select Water Use, a weekly water use screen would appear (Fig. 4). Returning to the home page and selecting Irrigation Schedule, a menu would appear asking to update Crop properties and provide additional information on last watering date, soil type, and irrigation frequency (Fig. 5). Once this information is provided and the Submit button is selected on the update Crop properties page, a schedule of irrigations after the last watering date is provided (Fig 6).

Fig. 1. The Crop Calculator home page screen.

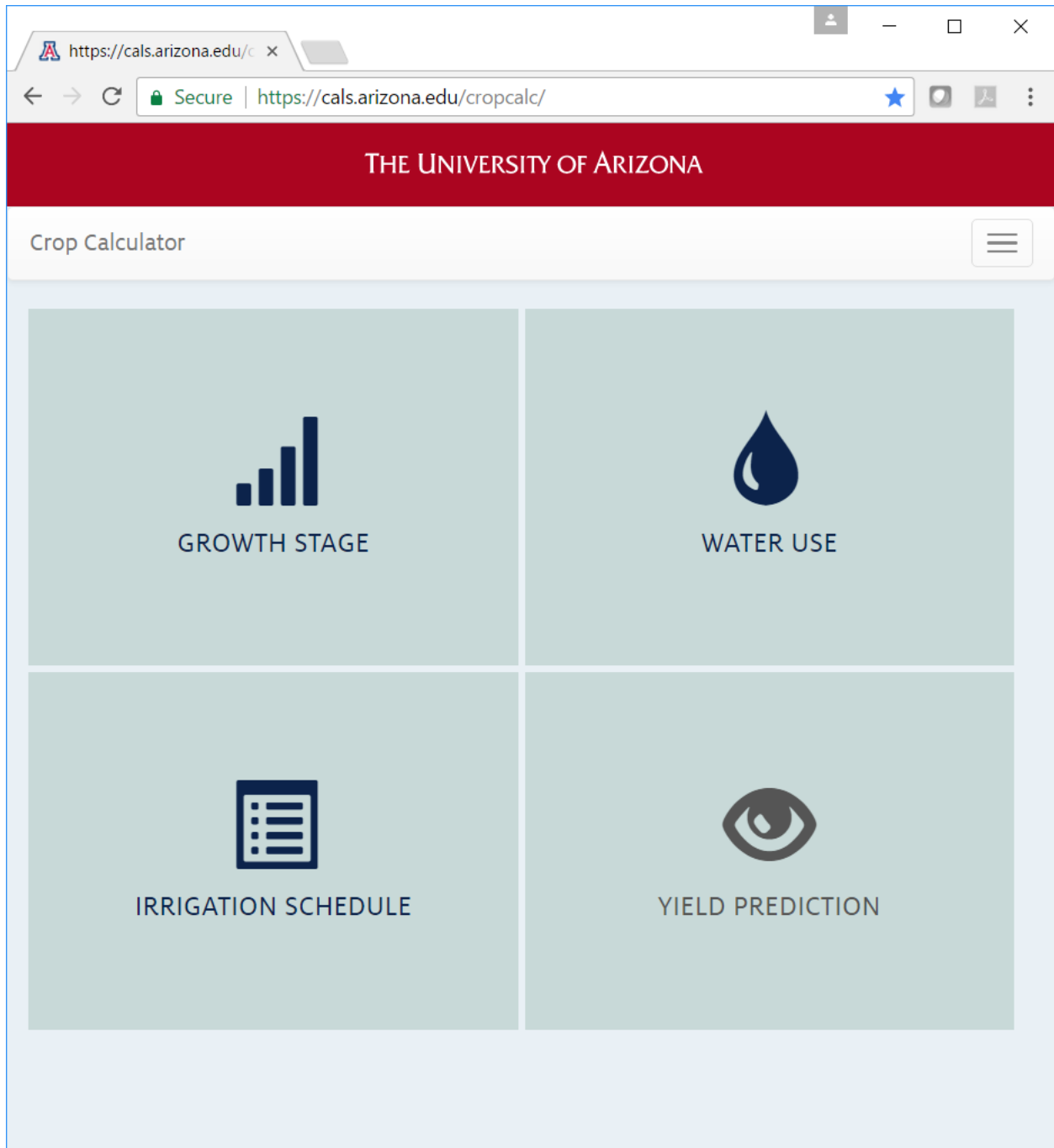


Fig. 2. Update Your Croproperties screen that appears after selecting the Growth Stage tool on the homepage.

The screenshot shows a web browser window with the URL <https://cals.arizona.edu/cropcalc/growthstage.php>. The page title is "Update Your Croproperties" with a green wrench icon. The form contains the following fields:

- Crop:** A dropdown menu with "Durum" selected.
- Variety:** A dropdown menu with "Average" selected.
- Planting Date:** A date input field with "12/15/2016" and a calendar icon.
- Nearest Weather Station:** A dropdown menu with "Maricopa" selected.

At the bottom of the form, there is a large green "SUBMIT" button and a "Cancel" button with a close icon.

Fig. 3. Calendar of growth stages which appear after submitting Croproperties. The screen shot below shows two of the 21 stages that appear. The remaining stages can be seen by scrolling down.

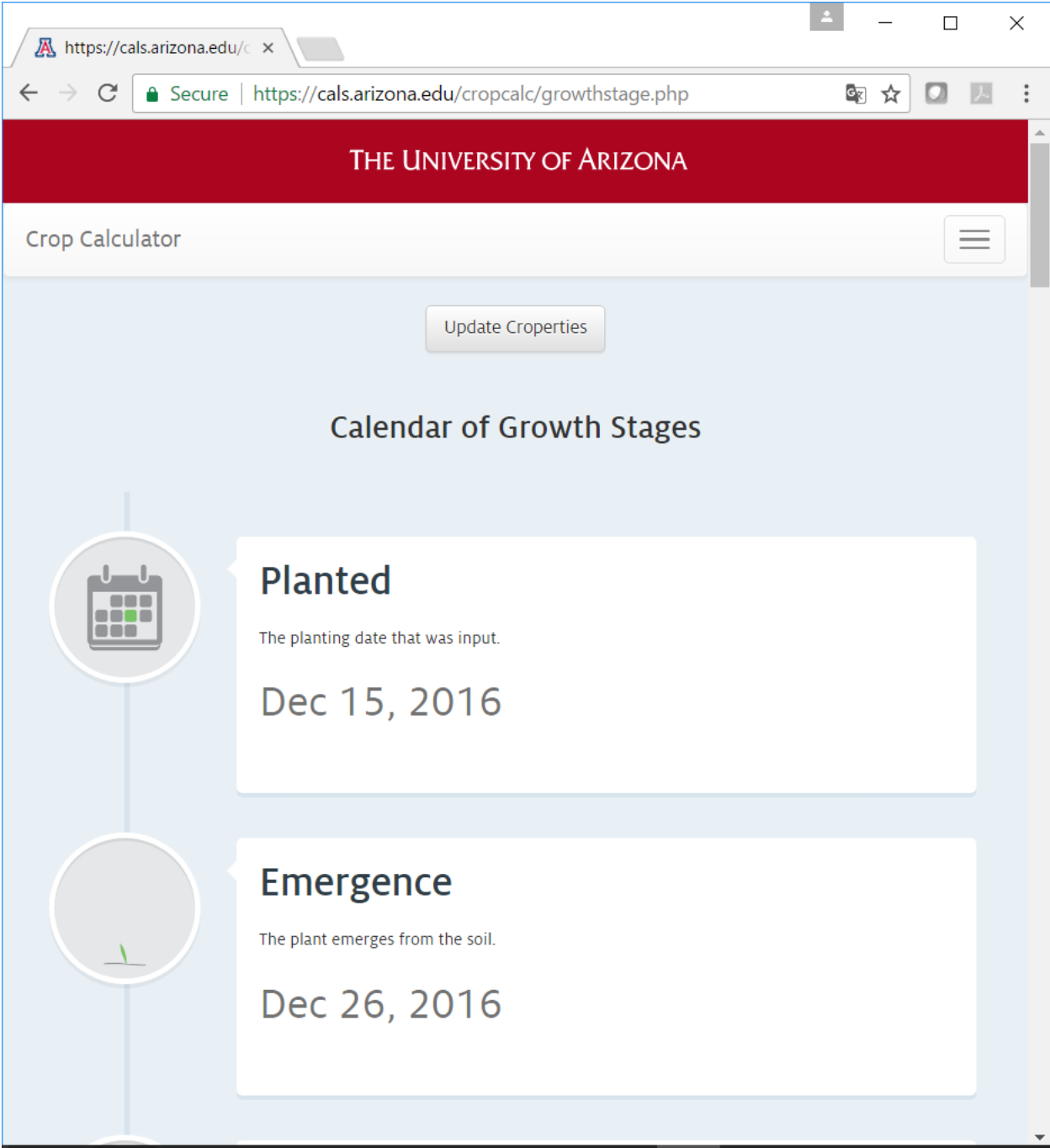


Fig. 4. Weekly crop water use provided by the Water Use tool.

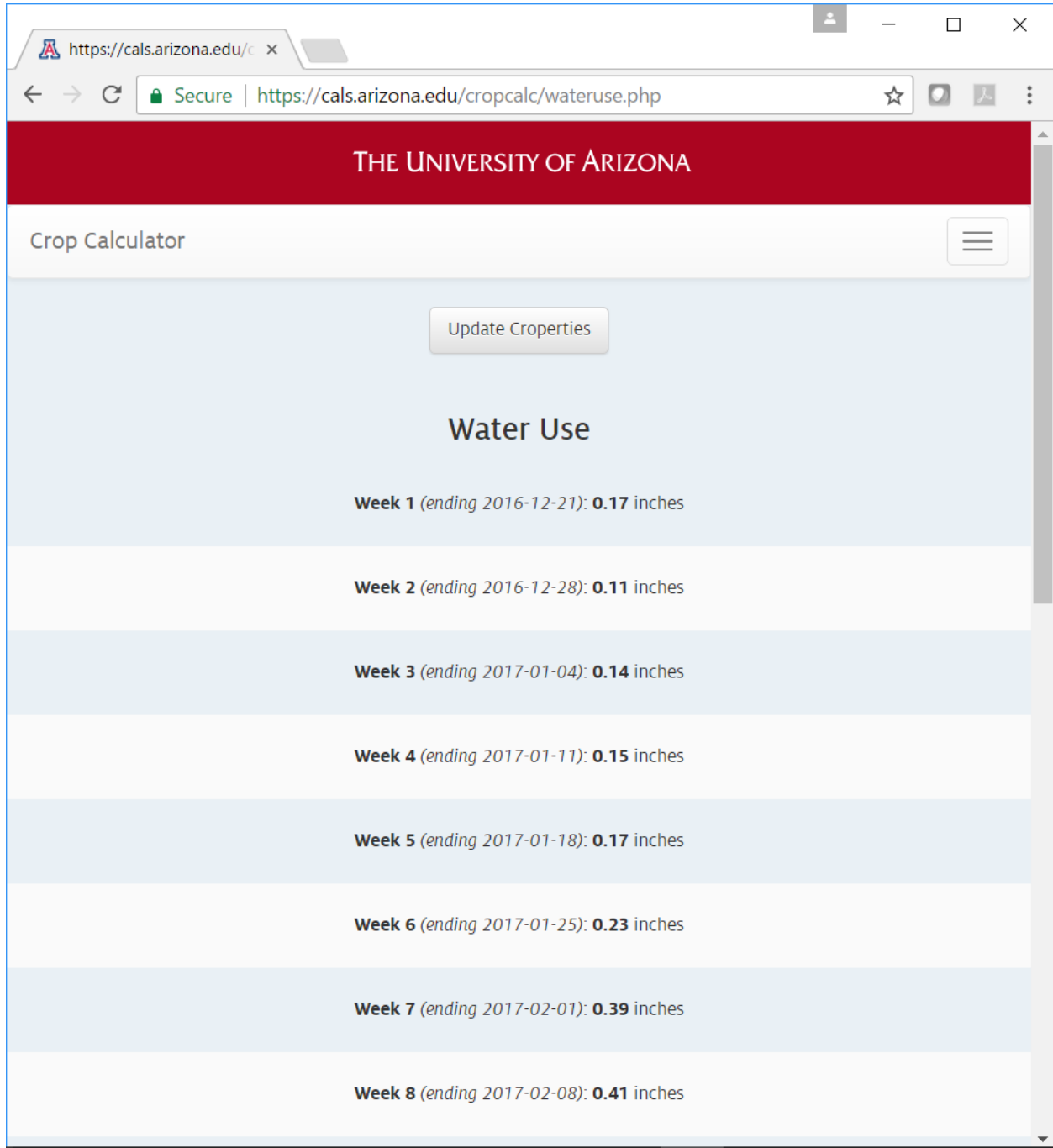


Fig. 5. The Irrigation Schedule tool requires the input of three additional Properties: Last watering date, soil type, and irrigation frequency.

The screenshot shows a web browser window with the URL <https://cals.arizona.edu/cropcalc/irrigation.php>. The page title is "Update Your Properties" with a green wrench icon. The form contains the following fields:

- Crop:** Dropdown menu with "Durum" selected.
- Variety:** Dropdown menu with "Average" selected.
- Planting Date:** Date picker showing "12/15/2016".
- Nearest Weather Station:** Dropdown menu with "Maricopa" selected.
- Last Watering Date:** Date picker showing "12/15/2016".
- Soil Type:** Dropdown menu with "Sandy Loam" selected.
- Irrigation Frequency:** Dropdown menu with "Medium" selected.

A large green button labeled "SUBMIT" is located at the bottom of the form. A "Cancel" button is partially visible at the bottom left.

Fig. 6. The irrigation schedule since the last watering provided for the Croproperties in Fig. 5.

The screenshot shows a web browser window with the URL <https://cals.arizona.edu/cropcalc/irrigation.php>. The page features a red header with "THE UNIVERSITY OF ARIZONA" and a white sub-header with "Crop Calculator" and a menu icon. A central button labeled "Update Croproperties" is positioned above the main heading "Irrigation Schedule". Below this heading, a text prompt reads "Based on your inputs, we recommend watering on the following dates:". The schedule is presented as a list of five dates, each centered in a light blue horizontal band: 2017-03-03, 2017-03-19, 2017-04-02, 2017-04-15, and 2017-04-26.

Recommended Watering Date
2017-03-03
2017-03-19
2017-04-02
2017-04-15
2017-04-26