Organic Forages for Pasture -
Estimated Costs of Production

Supplemental Information for the Excel Tool
John Allison Jr., S. Ray Smith, Kenneth Burdine, and Nat Colten

Cool season forages, such as tall fescue, orchardgrass, red and white clover, and alfalfa, frequently dominate pasture systems in the southeast. Plant growth of cool season forages decreases during periods of elevated temperatures and decreased precipitation; consequently, impacting animal production. Due to decreased grazing intake, many livestock and dairy producers supplement with hay and concentrates. However, organic dairy cows, must obtain a minimum 30% of their dry matter intake from pasture during the growing season, and are challenged with maintaining adequate milk production during summer months.

Novel forage mixtures are being evaluated for organic dairy cows in the southeast. This excel decision tool¹ compares warm and cool season annual forages to a cool season perennial forage system. This is especially important due to a general unfamiliarity with many of these annual forage species and the necessity of annual establishment. It has been created to assist producers with calculating and analyzing the costs associated with complex forage mixtures for organic dairy systems. Insight on utilizing the decision support tool can first be found by reading the cover and instruction pages on the spreadsheet. However, each tab is discussed in further detail below.

Screen Capture 1. The Cover tab is the first page in the decision support tool.

¹Annual Forage Production Decision Tool and Cost Analysis Excel Document can be found at https://forages.ca.uky.edu/decisionaids
Instructions

To navigate to other pages of the tool, use the white tabs at the bottom of the excel sheet. Since Mixture C contained perennial cool-season forages and no warm season forages it was considered to be the baseline control for this study (Screen Capture 2, Table 1). Details on this page should provide enough understanding to allow a user to continue navigating to the next tab of the document (the “Inputs” tab).

Screen Capture 2. The Instructions page explains how to use the document, contains a table of contents, and gives a detailed description of the forages used in this study.
Inputs

Despite the many blue cells, some may not need to be changed. The seed quantities present in Table 5 and the yields in Table 1, are the actual quantities used in the on-farm trials associated with this study. Remember, that all cells do not have to be used, but they must contain a value. For example, if you do not want to include “other labor” (which would be any labor hours other than operator labor hours), this blue cell should contain a 0 value. Forage Stand Useful Life pertains to costs that are prorated for stand life. For Mixture C, this includes all seed and lime. Since the other mixtures are all or mostly annual forages, the only prorated items are “Lime & Application” and red clover seed in Mixture A. “Forage Utilization Efficiency” refers to the quantity and distribution of forage consumed by grazing animals. Contained in the note on this tab are percent efficiency assumptions based on the amount of time in days that animals are allowed to graze a specific area.

Screen Capture 3. General Input Quantities and Prices do not include costs associated with machinery.
Machinery

Input costs associated with machinery can be entered manually using the first drop down menu, or a “Provided Custom Rate” can be utilized via the same drop-down menu. Surrounding states provide rates based on reassessed and summarized surveys in the annual extension publication AEC. The “Selected Machinery Operation and Costs” page must be completed according to the steps located on the left side of the page.

Screen Capture 4. Selected Machinery Operation and Costs are customizable through a series of steps that contain drop down menus.

**Step 1:** Drop down menu, “Which machinery costs would you like to use?”

**Step 2:** If “personal machinery calculations” is selected in step 1, complete Table 7. If using the “Provided Custom Rate”, leave Table 7 blank. Consult Tables 8 and 9 for cost estimates.

**Step 3:** Drop down menu, “Which rate do you want to use?” This option allows the user to further customize the “Custom Rate Survey Estimates.” Table 9 will modify the finalized rates based on the percent adjustment above or below the provided custom rates. Therefore, if the user does not know, or does not want to input, machinery costs that are specific to their operation, they can change the “Provided Custom Rate” to estimate their personal machinery.
This step also allows the user to specify the number of times they may complete a specific soil preparation method and/or whether they will use a no-till drill or a broadcast seeder. Finally, the number of times manure is spread and the pastures are cut on an annual basis are used to calculate each of these additional costs.

**Step 4:** Depending on which machinery costs were selected in Step 1, final costs can be viewed in either Table 7 or Table 9. Mixture budgets and a whole-farm summary are calculated from these tables.

**Individual Budgets**

Specific and associated costs to each mixture are itemized and totaled in the annual budget tabs. User input is not required on any budget tabs.

**Screen Capture 5.** The budget for Mix A shows a prorated cost for “Lime & Application” as well as red clover seed.
Screen Capture 6. Mixture C contains only perennials so seed costs are “prorated for stand life”. Therefore, Mixture C has a lower annual cost when compared to the other mixtures containing more annuals.

Summary of Costs

The Summary tab is used to compare costs per acre among the four different mixtures. To allow producers to make well-informed decisions regarding animal nutrition, the summary tab costs are calculated on a dry matter basis. "Average Cost per Ton of Utilized Forage" is an estimated cost of forage dry matter being consumed by animals. This cost takes into account the percent utilization efficiency that was accounted for on the "Inputs" sheet. If multiple mixtures are being used on the same farm, the summary tab can also be used as a whole farm budget. By inputting the
number of acres for each mixture, per acre costs are automatically adjusted. Then a “tons/farm” total is generated to calculate the annual costs per acre for the whole farm.

Screen Capture 7. The Summary tab shows costs across mixtures and the whole farm.

Overview

The “Organic Forages for Pasture – Estimated Costs of Production” decision tool is the product of a multi-state research effort funded by the USDA National Institute of Food and Agriculture. This research assessed warm season annual forage mixtures’ ability to meet the nutritional needs of dairy cows during the summer months when yields of cool season forages decrease in the southeast. This tool was created to help inform farmers of the costs associated with establishing and maintaining various forage mixtures. Comparisons are made between warm season annual mixtures and perennial cool season mixtures. Download the Annual Forage Production Decision Tool and Cost Analysis at:

https://forages.ca.uky.edu/decisionaids