

To: Benjamin Bagley and Dr. Franny Howes

From: Zak Rowland

Date: 5/31/2020

Re: Usability report for technical description and instructions by Benjamin Bagley

The purpose of this memo is to provide a heuristic analysis of the technical description and technical instructions that were prepared by Benjamin Bagley in terms of their usability and how they meet or do not meet genre expectations. In this memo, the technical description will be reviewed first followed by the technical instructions. Each of the two documents will include an analysis of the strengths, weaknesses, and a conclusion with suggestions on ways to improve (in that order.)

Technical Description

The technical description describes the flail mower mechanism including how it is attached, how it is driven, and how it works. The strengths of the description are described below.

Introduction: The introduction begins by defining what the mechanism is and what it is used for; This informs the reader of the description's topic. Following this definition is the description of four major components that are required for the flail mower to function. The end of the introduction provides a simplified explanation of how the mower attachment works before moving onto the body sections.

Description: The body sections to a great job of describing the flail mower mechanism. A context of use section is provided first to let the reader know why a flail mower is used and what differentiates it from a traditional mower. Descriptions of how the mechanism is attached to the tractor as well as how it is driven are provided before delving into the mechanism itself. I think this does a good job of providing the reader with preliminary information that will be useful in understanding how the mechanism works.

Conclusion: While a bit short, the conclusion provides a clear and concise end to the description. It informs the reader that the information is important for safe operation of the mechanism.

Layout and design: The overall layout of the description is excellent. It is simple, and whitespace is used effectively especially considering the word wrapping around the figures. The word wrap, as seen in Figure 1 below, is subtle, but is visually pleasing and makes reading through the document flow naturally. Most figures are right adjusted; however, the last figure seems to be left adjusted. I would right adjust it with word wrapping as done before or even center adjust, just to remain as consistent as possible.

component, the mower rotor and dozens of blades located within the drum of the flail. These blades spin in-line and opposite the forward direction of the tractor and chop up whatever they pass over, from grass to dense brush to small branches. The drum contains flying debris as it is processed by the blades.



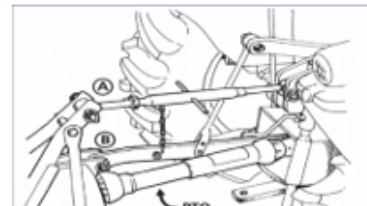
Figure 1, simplified tractor.

*Figure 1. An example of the simple, yet visually pleasing word wrap.
2020, Benjamin Bagley.*

Graphics: The graphics used in the description are excellent. Not only do they look good, but they vary in size and complexity as well, getting more descriptive as the reader progresses through the document. The figures are accompanied with references in the text as well, except for “Figure 1” in the introduction. An example of one of the strong figure references can be seen in Figure 2 below.

Attachment

The flail mower is attached to the driving tractor via a standard 3-point hitch. The hitch is comprised of 3 arms on the back of the tractor. As shown in Figure 3, arm A is an adjustable length for easier attachment and serves as the upper anchor point for the flail. Arms B and C are connected at the bottom anchor points and serve as the main attachment points for the flail. Arms B and C are connected to hydraulics that allow



*Figure 2. An example of a strong reference to a figure.
2020, Benjamin Bagley.*

As seen in Figure 2 above, the image being referenced also has lettered components which makes it easy to understand and reference as the reader. However, I believe this image (Figure 3 from the Attachment section,) should be made slightly bigger so it is easier to see the letters and the corresponding components.

The areas of the description that could use improvement are described below.

Introduction: The introduction does not include explicitly state the target audience of the description as well as why the description is useful to the reader. There is also no mention that there will be an “Attachment” section included in the body, so the 4 major components seem to indicate what the body sections will be. I suggest making it clearer in the introduction what is included in the document, who the audience is, and why they should care.

Language: While most terminology is understandable given the context, some terms could use a definition and even an image to ensure clarity. This includes terms like Power Take-Off, harvest chaff, locking collar, and knuckle joints. Also, as seen in Figure 3 below, some language used can be distracting to the reader.

The first part is the driveshaft, which receives power from the tractor's PTO. Following that, the transmission and belt drive serve as a **go-between** from the driveshaft to the final major component, the mower rotor and dozens of blades located within the drum of

*Figure 3. An example of distracting language from the introduction.
2020, Benjamin Bagley.*

I understood the intended meaning of “go-between,” however the wording is a bit odd. I suggest revising it to something like “... the transmission and belt drive serve to transfer energy from the driveshaft to the final major component...”

In conclusion, the description is concise and well written and includes great visual aids to help ensure the reader will understand the mechanism. The “Context of use” section and the order of the body sections provide a natural progression throughout the document. With some minor edits such as referencing “Figure 1” in the introduction, reorganizing the introduction, and defining some uncommon terms, the description will be a very strong and well put together document.

Technical Instructions

The technical instructions describe how to attach, operate, and remove a flail mower attachment from a tractor. The strengths of the instructions are described below.

Introduction: The introduction is clear, to the point, and covers all the preliminary information the reader may want to know. It describes why a flail mower is used, provides a warning about the hazards of the equipment, what will be included in the instructions, and who the instructions are intended for.

Safety and Warnings: The safety and warnings section after the introduction is not only prominent on the page, as seen in Figure 4 below, but provides a wealth of information regarding the hazards of operating the mower attachment.

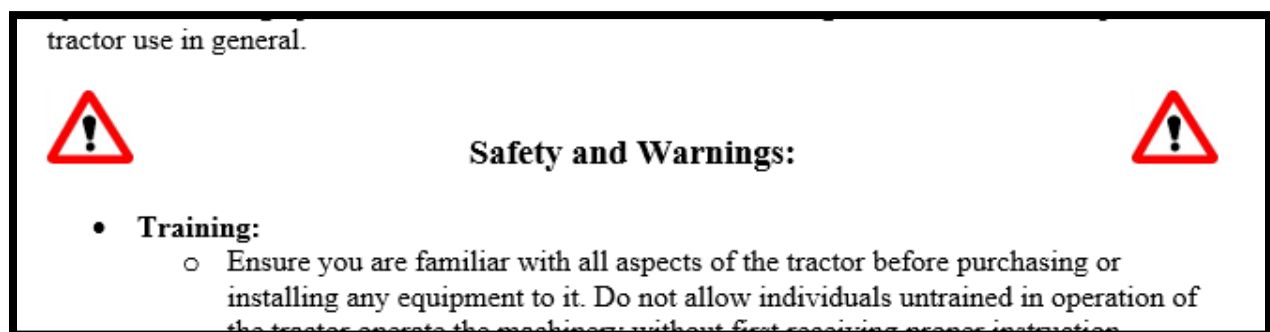


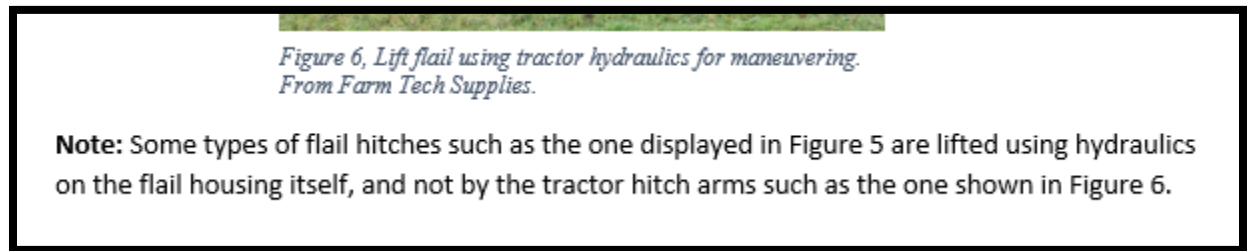
Figure 4. The bolded text and warning icons ensure the reader sees the information.

2020, Benjamin Bagley.

Body Sections and Steps: Overall, the body sections / steps are descriptive and well written. Each section has its own heading and roman numeral, and each step under the headings are in integer form. This format is easy to follow as the reader, and there are no sub-steps which means there is no need for the decimal numbering system as mentioned in Merkel's Chapter 20. The instructions begin with a visual inspection, which is always a good idea when working with any equipment, before delving into how to attach, operate, and detach the flail mower.

Conclusion: The conclusion marks a clear end to the instructions and provides resources to the reader to obtain supplemental information if they would like to. Since the information will vary by manufacturer, it is acceptable to not put a specific contact method in this case.

Layout and design: The layout of the instructions is simple yet effective. Each main section has a bolded heading followed by each of the steps for that section. The figures are also all centered which is consistent. There are also warnings throughout the instructions as well as a note as seen in Figure 5 below; these are not numbered as steps which is good.



*Figure 5. A note beneath a figure, not numbered as a step.
2020, Benjamin Bagley.*

Language: The language used in the document was easy to understand, and if I did not know a term, I could figure out it from context or by referencing a figure in the document. A list or table of terms and their definitions could be useful.

Graphics: Most of the images in the document seem to be created by Benjamin, which is great. These graphics all have appropriate references and captions and are useful in helping the reader follow the steps. Also, the warning icons are great at drawing attention to an important bit of information.

There is only one area of improvement primarily that the instructions that could use which is described below.

Introduction: While the introductory sections are already very well done, there are a few changes to be made that could improve them. I believe since your safety and warnings section is so thorough, it should come directly before the first step (visual inspection) and have its own dedicated page (page breaks.) This means the required equipment section would come directly after the introduction. On the subject of required equipment, try to include time estimates of the process as well. Finally, as mentioned earlier, a list of terms should be defined somewhere; this would fit nicely after the required equipment section.

In conclusion, the technical instructions are well written and detailed, and provide excellent safety warnings and supplemental information to the reader. Each section is clearly defined with its own easy to follow steps and accompanying figures. The steps are so well written I had to be quite “nit-picky” to find issues with the document. Even as someone who has only driven a tractor a couple times, and never operated equipment with one, I feel confident I could use your instructions to use one of these flail mowers on my own.

References

Bagley, B. (2020). *The Flail Mower Mechanism and Flail Mower Operation*. Retrieved May 31, 2020.

Appendix A (Technical description and instructions heuristic checklist)

Heuristic Checklist for Technical Description

Introduction

- ☒ Brief indication of the nature and scope of the description.
 - ☒ The reader knows what information is covered and not covered in the technical description.
 - ☒ The reader knows who the target audience is.
 - ☒ The reader knows what the target audience is supposed to do with the information (learn, learn to do, later interact with object, mechanism, or process).
- ☐ Brief statement of why this object, mechanism, or process is significant to the reader.
 - ☒ The reader knows the value of the description (why he/she is likely being asked to read the description in the context of use)
- ☒ Overview of the object, mechanism, or process – may include any of the following, as applicable:
 - ☐ The reader is given historical background information
 - o Date when the object/mechanism/process came into existence & who created it
 - o Any updates or changes since its original creation.
 - o Any new applications of it since its original creation.
 - o Any known issues/concerns with it since its original creation or later iterations.
 - ☒ The reader is given a definition of object, mechanism, or process
 - o A sentence definition that explains the type/category and distinguishing characteristics.
 - ☒ The reader understands the context of use (where it is used, by whom, and for what purposes)

Detailed Description (body sections)

- ☒ Detailed explanation of object, mechanism, or process:
 - ☒ The description uses appropriate styles of organization (spatial, functional, chronological, partition of the parts of the whole)
 - ☒ Yes – explain what works well to meet reader & genre expectations

The organization style is mainly functional, but also somewhat chronological, and it works great for this description. It begins with an explanation of how the flail mower is attached and driven before diving into how it works. This order works well because the reader would likely be curious as to what makes the blades move.
 - o No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.
 - ☒ The description answers the following questions:
 - ☒ What is the object, mechanism, or process?
 - ☒ Yes – explain what works well to meet reader & genre expectations

The first sentence in the introduction defines the mechanism (PTO operated flail mower) and what it is used for. It is straight forward, and the reader knows what the description will be about right from the start (disregarding the title.)
 - o No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

- ☒ How is it defined (beyond a sentence definition – with an extended definition)?
 - ☒ Yes – explain what works well to meet reader & genre expectations

Not only is there a sentence definition in the introduction, but the “Context of use,” “Rotor and blades,” and “Flail drum” sections provide a much deeper definition of the flail mower attachment.

- ☐ No – explain what doesn’t work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

- ☒ What does the object, mechanism, or process do?
 - ☒ Yes – explain what works well to meet reader & genre expectations

The “Context of use” section provides good insight as to what the flail mower is for and why it is used. Then, the body sections provide more detail on how the mechanism is driven and how the mechanism itself works.

- ☐ No – explain what doesn’t work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

- ☒ What does the object, mechanism, or process look like (size, shape, texture, compared to others (analogy, negation/what it is not like, etc.)?)
 - ☒ Yes – explain what works well to meet reader & genre expectations

The figures included with the description do a great job of letting the reader know what the mower looks like and how it operates. There are references in the body of the text for all the figures as well.

- ☐ No – explain what doesn’t work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

- ☒ What is the object or mechanism made of (if you are describing an object or mechanism and not a process) – materials, durability, etc.?
 - ☒ Yes – explain what works well to meet reader & genre expectations

Four components are described that are required for the mower to function, and sometimes you added in a material when it made sense such as “Connected to the rotor are dozens of **metal** blades...”

- ☐ No – explain what doesn’t work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

- ☒ How does the object, mechanism, or process work?
 - ☒ Yes – explain what works well to meet reader & genre expectations

As mentioned earlier, the description first describes how the mower is attached and driven by the tractor. Then, detailed information is provided on how the rotor, blades, and flail drum work together.

- ☐ No – explain what doesn’t work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

☐ Why should the reader be interested in your object, mechanism, or process?

- ☐ Yes – explain what works well to meet reader & genre expectations
- ☒ No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

There is no direct mention of why the reader should be interested in this mechanism. I suggest adding this to the introduction before delving into the four components used in the flail mower operation.

Conclusion

- ☒ A brief closing statement that summarizes the value of knowing more about the object, mechanism, or process. It provides closure to the reading process.
- ☒ Yes – explain what works well to meet reader & genre expectations

The conclusion, while short, reinforces to the reader why the information they just read is valuable.

- ☐ No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

Document Design

- ☒ The description uses headings and sub-headings appropriately
- ☒ The description uses balance, contrast, proximity, and alignment appropriately
- ☒ The description uses white space effectively
- ☒ The description uses font appropriately
- ☒ The description uses layout effectively
- ☒ Yes – explain what works well to meet reader & genre expectations

The layout of the description is fantastic, and all the standard APA style formatting criteria is met. The word wrapping around the images make them fit naturally into the document which makes it easier and more enjoyable to read.

- ☐ No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

Graphics

- ☒ The description includes an overview graphic to illustrate the whole object/mechanism/process
- ☒ The description includes smaller graphics to illustrate the parts of the whole – or stages of a process
- ☒ Yes – explain what works well to meet reader & genre expectations

Towards the beginning of the document, the graphics are simple yet effective. As the you continue reading, the figures get larger and more complex which flows well with the description.

- ☐ No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

Prose/Language

- ☒ The description uses a level of wording appropriately for the target audience.
- ☐ The description defines jargon or terms that may be unfamiliar to novice audiences (of a mixed audience with semi-skilled and experts)

Although this document is targeted towards farmers and those who own tractors, most of the terms will likely be understandable. However, a novice might not know terms like harvest chaff, spline, locking collar, knuckle joints, etc.

- ☒ The description is free from grammatical and mechanical mistakes
 - ☒ Yes – explain what works well to meet reader & genre expectations

I noticed only a few minor grammatical mistakes, otherwise the document is well written and edited.

- ☐ No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

Heuristic Checklist for Tech Instructions

Title & Introduction


- ☒ Title page/title is formatted according to genre conventions (how to or gerund -ing).
- ☐ The introduction offers a brief statement of why the document is significant to the reader.
 - ☒ The reader knows the value of the instructions (the goals that the reader will accomplish with the instructions)
- ☒ Introduction gives necessary background information, as applicable:
 - ☐ The reader is given policy background information (if the instructions are for a policy and procedure)
 - ☐ Date policy was approved/revised.
 - ☐ Authorities overseeing policy (HR, Licensing Organization, Agency).
 - ☒ The reader is given prefatory information appropriate to carrying out tasks:
 - ☐ Time to complete task.
 - ☒ Skill level or prerequisites needed.
 - ☒ Relevance of task to job/position.
 - ☒ Context of use or stage setting.
 - ☒ Safety information.
 - ☒ Equipment & materials needed.
 - ☐ Definition of terms.

Detailed Step-by-Step Instructions (body sections)

- ☒ The body sections offer a detailed explanation of process/procedure:
 - ☒ The instructions use imperative mood (action verbs) to command the user to *do* something (complete the task in smaller steps).
 - ☒ Yes – explain what works well to meet reader & genre expectations

All the steps use imperative mood verbs correctly and as necessary, such as *check*, *position*, *twist*, *disengage*, etc.


- No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

 The instructions use chronological order and numbers each step in the process/procedure; uses decimal system numbers for sub-steps (see Chapter 20).

- Yes – explain what works well to meet reader & genre expectations

The general steps of the process are all headings and numbered with roman numerals, and the main steps use the integer system which makes the instructions clear to the reader as well as meets Merkel's guidelines from Chapter 20.


- No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

 The instructions provide ample graphics to support task completion (at least 5).

- Yes – explain what works well to meet reader & genre expectations

There are 8 graphics total and *at least 5* of which appear to be created by Benjamin. These graphics are great at giving a visual representation to all the various components that make up the flail mower and how they operate together.


- No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

 The instructions label, caption, cross-reference, and cite graphics.

- Yes – explain what works well to meet reader & genre expectations

All figures are captioned and labeled throughout the document, as well as referenced in the body of the text.

- No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.


 The instructions use feedback statements, notes, warnings, etc. appropriately, as needed, and are NOT numbered as steps in the process (but nested between numbered steps).

- Yes – explain what works well to meet reader & genre expectations

There are warnings throughout the text as needed which are made highly noticeable with warning icons and bolded warning text. There is also a note under one of the figures, and neither the warnings or the notes are numbered.

- No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

Conclusion

 The instructions offer a brief closing statement that signals task completion. It provides closure to the reading process.

- Yes – explain what works well to meet reader & genre expectations

The final body section (Storage) is a natural segue into the conclusion, making the task completion clear and provides closure to the reader.

- No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

☒ The instructions provide supplemental information about one of the following: maintenance tips, troubleshooting help (where to go online/who to call), or information about similar related tasks/topics (where to go online/who to call).

- ☒ Yes – explain what works well to meet reader & genre expectations

The last section of the conclusion provides great resources on how to get more information on the flail mower while also making it clear that information will be different from manufacturer to manufacturer.

- No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

Document Design

☒ The document uses headings and sub-headings appropriately.

☒ The document uses balance, contrast, proximity, and alignment appropriately.

☒ The document uses white space effectively.

☒ The document uses font appropriately.

☒ The document uses layout effectively.

- ☒ Yes – explain what works well to meet reader & genre expectations

The layout of the document is simple yet effective and follows APA formatting criteria. Graphics are also centered on their own lines with captions underneath.

- No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

Graphics

☒ The instructions include an overview graphic to orient the reader to the process/procedure.

☒ The instructions include smaller graphics to illustrate sequential steps in the process/procedure.

- ☒ Yes – explain what works well to meet reader & genre expectations

The steps that seem to require the most visual aid have a figure associated with them, which does a great job of assisting the reader in following along with the steps.

- No – explain what doesn't work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.

Prose/Language

☒ The document uses a level of wording appropriately for the target audience.

☐ The document defines jargon or terms that may be unfamiliar to novice audiences (or a mixed audience with semi-skilled and experts).

- ☒ The description is free from grammatical and mechanical mistakes.
- ☒ Yes – explain what works well to meet reader & genre expectations

There are only a few minor grammatical errors in the instructions, such as in the conclusion using “manufacture” instead of “manufacturer.” However, nothing major or distracting.

- ☐ No – explain what doesn’t work well to meet reader & genre expectations AND what revision suggestions you have to improve the draft.