

Continuous Fiber Felting Machine

Final Report for FNC05-548

Project Type: Farmer/Rancher

Funds awarded in 2005: \$6,000.00

Projected End Date: 12/31/2007

Region: North Central

State: Michigan

Project Coordinator:

[Suzanne Pufpaff](#)

Pufpaffs Fiber Processing, LLC

Project Information

Summary:

PROJECT BACKGROUND

Pufpaffs Fiber Processing is located on a small (60 acre) family farm in Barry Co, Michigan. It is a registered tree farm, which is managed for timber. The tops from timber sales and trimmings from woodlot management are used to heat the mill and other buildings on the farm as well as heating all the water used for scouring wool, dyeing, and felting in the mill. The farm also has a small flock of Shetland sheep guarded by Llamas. All hay needed for the flock is produced on the farm. Manure is recycled onto the hay fields to reduce the need for commercial fertilizers.

Sustainable practices include the use of woodlot trimmings to heat building and water, which has been done since the mill was opened in 2001.

PROJECT DESCRIPTION AND RESULTS

The production of sheep and other fiber animals is a very marginally profitable undertaking. There are many farms producing these animals on marginal land that cannot effectively produce traditional field crops. To make it possible for the wool to be economically converted into a marketable product enhances both the income of my farm and all the small flocks that I service, thus making it possible for these marginal lands to continue to be productive. There are also a growing number of Alpaca operations in the North Central Region producing quantities of fiber that there is currently no viable way of marketing in the US. This machine will help utilize some of that fiber to create garment weight alpaca and alpaca blend felt for the boutique fashion industry.

The desired results of this project was to produce a machine that would make it possible to streamline the production of custom-made felt in units large enough to have marketability in the garment and craft industry.

PROCESS

In determining how the machine was going to be configured, all current options were researched and evaluated to determine pros and cons. After the evaluation, a determination was made as to what was needed to create a machine that would incorporate the best features of the currently existing machines and add to that the

ability to make long continuous lengths of fabric.

The machine needed to be durable, have a working area that the fibers would feed through multiple times without the need for operator input and would work the fibers in multiple directions on each pass of the fabric. This was determined by years of experience as a feltmaker.

PEOPLE

- Don Evans and Anne Vickery of Feltcrafts from Woodland Park, CO did the actual building of the machine.
- Design was a joint effort of Suzanne Pufpaff and Don and Anne.
- Suzanne Pufpaff and Marilyn Westphal of Wayland, MI are conducting machine testing.
- Beverly Garrett of Battle Creek, MI and Roxanne Pett of Lake Odessa, MI are doing support work to get fibers ready for the machine.
- Laura Mae Weingadtz of Middleville, MI has been working as summer help during her summer break from her College Fiber Arts Program.
- Barbara and Gene Marr of Marr Haven Farms and Jill Turner of The Lady Peddler have both assisted in marketing.

RESULTS

The Ultimate Felting Machine is able to create felt yardage in greater amounts with less operator input than any other machine currently available to smaller mill operations. Measurements are based on the amount of usable yardage produced in an average day. The machine is still being fine tuned, but even at this point it is possible to create 25 to 30 yards per eight hour day with a single operator. Further modification of the machine should increase the production by 20 percent or more. The flat plate felter available to the small mill operation can produce up to 10 yards of prefelt in a day which still needs further finishing to be usable. Needle felting operations don't even compare as the product created is very different.

Rolling machines are limited by the amount of weight the operator can handle during a working day because all fiber is loaded onto the machine wet and must be unloaded and reloaded multiple times. A generous estimate of the possible production of garment weight felt off a rolling machine in an 8 hour work day would be 10 yards.

The results of the construction of the machine are less than expected. The first prototype was not durable enough for production work. This was addressed in the second prototype with a welded tubular steel frame. There have been some difficulties with the way the rollers were constructed which is being addressed by building welded hub rollers. The tracking system for the belts is still being studied to find a way to stabilize belt movement.

If the building were designed for the machine, a floor drain and water to the machine location would be desired. These may be retrofitted to the current location in the future.

Stainless steel would be a more appropriate material for the axles on the rollers due to the high moisture content of the work area.

The height of the machine limits who is able to operate it effectively. Future models should incorporate height adjusters.

Even with some of the construction issues on the machine, it is still possible to create large quantities of finished felt yardage with a reasonable amount of operator effort. This is not a fully automated machine and that was not in the design specs.

DISCUSSION

In putting this project together, I have learned how challenging it is to work with

machine builders who are located at great distances. If I did something like this again, I would look to more local sources for the machine construction.

The addition of the Ultimate Felting Machine to my carding mill operation has made it possible to offer felting services at a reasonable cost where the product can be delivered in a timely fashion. This was not possible before the introduction of the machine. This has allowed me to be able to employ more individuals and increase the income from the mill. With the coming fall and winter show season, we will be introducing a line of felted vests created from the output of the machine. If the response to this product is close to expectations, production should continue to increase in the mill. We will be continuing to look for ways to improve the operation of the Ultimate Felting Machine and we will also be writing an operators manual as soon as all the initial corrections are complete.

One disadvantage of working with a prototype machine is that there are no set answers to problems when they arise. Many hours have been devoted to machine adjustments that will not be needed once the initial issues are resolved. If I did not have Marilyn Westphal willing and able to work on the machine with me to do needed repairs and adjustments, this project would not have been possible.

RECOMMENDATIONS

The Ultimate Felting Machine is a good investment for someone who has a working knowledge of feltmaking, is in good physical shape, and has some mechanical aptitude. With that type of background, I feel this machine can pay for itself in less than a year. Without a good working knowledge of feltmaking, it would be very difficult to fully utilize this machine and even though it does make the job easier, it is still a physically demanding operation.

OUTREACH

- Machine arrived in the mill April 21, 2007.
- On April 28th, the first demonstration of the machine took place to interested parties of the Michigan Llama Association. Twenty people saw the machine demonstrated that day.
- On May 5th and 6th, I took samples of the felt products produced by the machine to the Spring Alpaca Show at the Oakland County Fairgrounds in Davisburg, MI. An additional 25 to 30 people stopped to discuss how the service might be used in their operations.
- On May 12th, I gave a talk to the Spinners Flock Guild in Chelsea, MI on how the machine-made felt is produced and how it can be incorporated into their spinning and knitting projects. Over 100 individuals were present.
- On May 14th, I gave a short talk and presentation at the Kalamazoo Weavers Guild Monthly meeting. Over 50 people were present.
- On May 29th, a tour was given at the mill focusing on the felting machine- 8 present.
- On June 2nd and 3rd, I took samples of the felt products produced by the machine to the Spring Llama Show at the fairgrounds in Mt. Pleasant, MI. An additional 15 to 20 people stopped to discuss and learn more about the services and products.
- June 19th, a mill tour for a 4-H group came through the mill and got to see the machine in operation as part of their tour. Six present.
- July 9th, a mill tour was offered to the National Shetland Sheep Breeders Association in conjunction with their national show. Six individuals participated.
- As of July 15th, over \$4,500.00 worth of felting services have been sold on the machine.
- Announcements have been posted on the internet through web site, and email lists on an ongoing basis since the first of the year.

Future scheduled events, 2007 and 2008:

- July 20, 21, and 22, Midwest Fiber and Folk Art Fair at The Lakeside Legacy Arts Park in Crystal Lake, IL where I will be introducing products from the machine to the general public.
- July 25-29th, I will be vending at The Midwest Felter Symposium in Madison, WI where I will be demonstrating how various fibers react on the machine.
- August 1st, the Barry County Extension Office staff will be touring the mill and seeing the felting machine in operation. Eight people expected.
- August 15-19, I will be vending at The Michigan Fiber Festival at the Allegan County Fairgrounds in Allegan, MI and will have the felts and felt products on display along with photos of the machine in a yurt. Average annual attendance to the event is over 5,000 individuals interested in fibers.
- September 1-2, a staff member will be marketing felt related products from the machine at Lamafest in East Lansing, MI. This is the largest Lama Show in the state of Michigan.
- September 29-30, I will be vending at Northern Michigan Lamb and Wool Show in West Branch, MI and will again be promoting product and services.
- October 27-28th, I will be vending at a new show in Ann Arbor, MI, Fiber Expo where I will continue to promote product and services.
- November 1-3, I will be attending the Farmers Forum at the National Small Farm Trade Show & Conference in Columbia, MO to do a 20 minute presentation on the Ultimate Felting Machine
- November 15-17, November 24, and December 1 will be guild sales where I will be marketing products created on the felting machine.
- January 5-6th, 2008, I will vend at the Michigan Sheep Breeders Association annual meeting in Lansing, MI Where I will display product and promote service.

In addition to all of these scheduled events, there are impromptu tours given at the mill to interested customers, telephone conversations detailing services available, and the updating of the mill web site <http://fibermill.yurtboutique.com> and continuing to post to selected email lists.

Even after this listing, the service will continue to be promoted right along with all the other services the mill offers on an ongoing basis.

PROGRAM EVALUATION

The granting organization has been easy and helpful to work with. Keep up the good work.

Research

Participation Summary

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture or SARE.



Sustainable Agriculture
Research & Education [US Department of Agriculture](http://www.sare.org)



This site is maintained by SARE Outreach for the SARE program and is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award No. 2019-38640-29881. SARE Outreach operates under cooperative agreements with the University of Maryland to develop and disseminate

information about sustainable agriculture. [USDA is an equal opportunity provider and employer.](#)

© 2022 Sustainable Agriculture Research & Education