spinning daily presents

A Guide to Processing Wool to Make Wool Roving:

Washing Wool, Carding Wool, and Combing Wool

Spinners by nature like to make things from scratch. Not only are we compelled to make our own fabric, we've started down the slippery slope of making our own yarn—and now are considering processing our own fibers. Our friends and family may be wondering when we're going to buy our first flock of sheep—perhaps you have already! At any rate, it is a natural progression and we've compiled a number of articles for you that should make the process of getting started easy and fun.

One of the oldest of Interweave's publications, *Spin·Off* is a quarterly magazine that has been around since 1977 inspiring spinners new and old to make beautiful yarn and find enchanting ways to use it. We also host the spinning community, spinningdaily.com complete with blogs, forums, and free patterns, *Spin·Off* Autumn Retreat (SOAR)—an intense and inspirational week with like-minded spinners, and our series of workshop videos where the living treasures of the spinning world share their knowledge with you. We're devoted to bringing you the best spinning teachers, the newest spinning ideas, and most inspirational creativity right to your mailbox, computer, and ultimately fingertips.

We hope you enjoy your spinning journey—come tell us about it at spinningdaily.com.

Happy spinning,

Amy

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FIBER PREPARATION:

What are Roving, Top, *and* Sliver?

By Abby Franquemont

It's common nowadays for a lot of folks in the fiber world to use the word "roving" to refer to any unspun fiber. This isn't really accurate and doesn't give a clear sense of what the preparation really is—and the preparation is relevant!

Preparation refers to the way the cleaned (and sometimes dyed) fibers have been organized before spinning. Preparation involves tools such as handcards, flick carders, drumcarders, wool combs, hackles, and minicombs. These tools are designed to align the fibers.

In most European-derived spinning traditions, yarns are categorized as worsted or woolen; worsted yarns are tightly spun without air trapped between the fibers; they are spun from combed prep with all the fibers parallel, producing a smooth, long-wearing yarn. Woolen yarns are produced from carded prep using more hands-off techniques and resulting in a more heterogeneous fiber alignment with air trapped in the yarn. Woolen yarns are lofty; worsted yarns are dense.

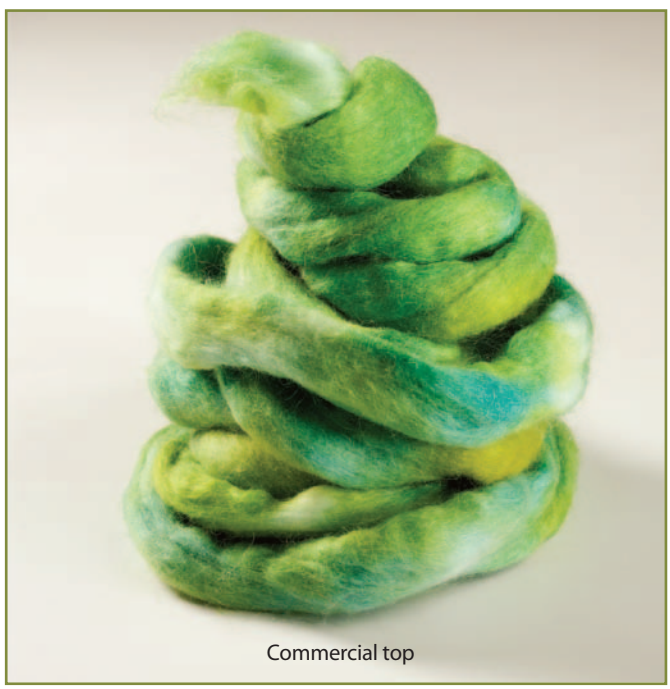
Traditionally, it is not possible to spin a true worsted yarn unless you use both worsted prep and worsted drafting technique. Likewise, for a traditional woolen, you need woolen prep and woolen drafting technique. However, I think of these categories as defining the ends of a spectrum of possibility and urge mixing and matching for results that traverse that spectrum.

There are also Andean, African, and other non-European textile traditions whose yarns don't exactly fit in that spectrum. Nonetheless, English speakers tend to discuss those techniques with terms from Western European traditions.

Another important thing to note about the types of fiber preparations available for handspinners today is that many of them are not prepared specifically for handspinners—they are intermediate stages in industrial processing, adapted (or adaptable) for handspinning.

The bottom line is that there are more preparations of fiber, done by hand or done by machine, available to the handspinner now than at any time before.

Handcombed top



Commercial top

A true **handcombed top** is the only thing from which you can spin a traditional worsted yarn. For a worsted yarn, all the fibers are parallel, smoothed down into the yarn with the air squeezed out, and there is no twist in the drafting zone. This prep is really best suited to true worsted spinning, but can be spun semiworsted (using a woolen technique).

A **commercial top** is a machine-produced variant of the above. The fibers are mostly all parallel, but whereas a true combed top will present them tip first every time, a commercial top does not. This causes commercial top to draft a little less smoothly than true handcombed top, a tendency that is heightened by the fact that commercial top will often become a little compacted in shipping and storage, while handcombed tops are usually very fresh. Once you're used to this prep, you can spin a pretty fair worsted yarn, a pretty fair woolen-ish yarn, or a range of yarns in between.

A **rolag** is made with handcards—it's a puffy roll of fiber. Traditionally, for woolen spinning, you spin a rolag from one end, and your fibers end up circling around a hollow core as you use a fast long-draw drafting technique. You could spin this with worsted technique, but it would be slow. You'd still get fuzzy, not smooth yarn, but it would be stronger than a traditional woolen.

A **batt** is made on a drumcarder and is like a blanket of fibers, carded, but more aligned than you get in a rolag. You can strip these, predraft them, tear off chunks, or roll them up, and then spin them with what's considered either woolen or worsted technique; and you can pull them or tear them into rovings.

A **roving** is a carded preparation whether produced by hand or industrial equipment. It is commonly wrist-thick, though thickness can vary; one way or another, a roving is usually made from a batt, either pulled off the carding equipment in roving form, or in some cases, pulled later from a batt.

A **sliver** is a thinner variant of a roving. Sliver doesn't have any twist to it at all, while roving has a tiny bit of twist (not spinning twist, but a slight twist to the entire rope). Sliver is what mills generally call their intermediate stage. (**Note:** it's pronounced sly-ver).

Pin-drafted roving has been carefully drafted through a series of pins, producing an open, lofty roving with a more aligned prep than is typical of other rovings.

A **puni** is similar to a rolag, prepared on handcards, after which the fibers are rolled on a stick and compressed by rolling this stick on a flat surface. Punis are a common prep for cotton and other very fine fibers.

Hankies, caps, bells, and mawatas are common terms for silk preparations in which silk cocoons are stretched out wide and layered together. These do look rather like a handkerchief, cap, or bell, depending on


Rolag


Batt


Roving

how large they are and what they have been stretched over. These are typically spun by loosening the fibers from the middle and drafting (or predrafting) from the inside out to the edges. These preparations don't lend themselves to spinning yarns that are as smooth as those from silk top or sliver would be. ⌘

Abby Franquemont, raised in the fiber arts, lives in Ohio where she runs www.abbysyarns.com and serves on the board of directors of Andean Textile Arts. She spins, weaves, knits, crochets, braids, sews, mends, and designs, and talks about it all nonstop.

Handcombed top, made from dyed Corriedale top from Louet North America, www.louet.com. Commercial top, Mohair wool blend from Bonkers Handmade Originals, www.bonkersfiber.com. Rolag, made from Polwarth fiber from Rovings, www.rovings.com. Batt, wool/silk blend from Loop, www.loop.etsy.com. Roving, dyed wool roving from Lone Tree Wools, www.lonetreewools.com. Sliver, Northern Lights wool from Louet North America, www.louet.com. Pin-drafted roving, Shari McKelvey at Morro Fleece Works, www.morrofleeceworks.com. Puni, made from cotton/silk top from Louet North America, www.louet.com. Hankies, Chasing Rainbows Dyeworks, www.crownmountainfarms.com/html/rainbows.html.


Sliver


Pin-drafted roving


Puni


Hankies

Washing Wool

By Robin Russo

One of the questions I am most frequently asked while teaching is how to wash wool. I don't know of anyone who has not experienced a problem at one time or another when washing a wool fleece. It is a process that eludes most new spinners and can even cause problems for the most proficient wool worker. Getting the fleece squeaky clean and not felting it in the process was one of my first hurdles. In my early spinning years, I convinced myself that washing as much fleece as I was able to at one time was the best way to attack the job and get it over with. That attitude created a whole new set of problems, especially when the weather was not accommodating, and I had wet wool everywhere in my house for a week. I also learned firsthand of the problems you can create for your wastewater system when so much lanolin goes down the drain. At about the same time, I took a class with Margaret Stove, author of *Handspinning, Dyeing and Working with Merino and Superfine Wools* (Interweave, 1991), who enlightened me with her method of washing very small amounts of wool at a time.

There are many ways to wash wool. I have developed my method of washing after thirty-four years of experimenting. I use this method whether I am washing one small bag of very fine wool in my sink or an entire fleece outside in a washtub on a beautiful sunny day.

I wash at least ten fleeces a year. I try to do 90 percent of my washing outside during the summer months. I have large burners and tubs set up and easy access to an outside water source. All of my wastewater is thrown into the woods on my property (the soap is environmentally friendly). For drying large quantities of wool, my husband made me a drying rack that I place on sawhorses. It looks like a skirting table with plastic mesh screen stapled to a 4-by-8-foot frame made up of 4-by-8-inch pine boards. The frame will hold several wet, heavy fleeces. The open mesh allows free flow of air so that the fiber dries quickly on a nice day. The plastic mesh can be purchased at almost any home and garden center. This frame hangs on the woodshed (just under the overhang) when it is not in use.

The first step I take when washing wool is to lay the fleece out and make sure it is well skirted. Skirting means removing the short and very dirty fiber that is found in the britch area of the fleece. When you pay a premium price for a handspinning fleece, these tags, as they are called, should already be removed. If I see many second cuts, I may shake the fleece so the short fibers fall away from the wool. If not removed, these second cuts can create a problem during fiber preparation (carding or combing) or while you are trying to create a smooth and consistent yarn.

Secondly, I look at the type of wool I am washing. Is it a fine wool with a high lanolin content (up to 50 percent of the weight of the wool), or is it a luster wool with less lanolin (up to 20 percent of the fleece weight)? The only difference in my handling of different types of wool is that I generally wash fine wools twice to ensure the lanolin is removed. If the lanolin is not removed, the dry fiber becomes tacky (sticky) in a very short time. This tackiness makes it difficult to get a satisfactory fiber preparation and inhibits the ability to draft the fiber evenly when handspinning. Although it is a little more challenging to wash fine wool, taking a few precautions will help ensure that the wool gets squeaky clean the first time it is washed.

Wool wash

I have used Orvus Paste for many years and appreciate the way it cleans raw wool. It is gener-

ally available at feed and tack stores. In the past few years, some new products have come on the market that are available to handspinners through local fiber stores, sheep and wool festivals, as well as on the Internet. They are referred to as wool scouring agents, and they also do a great job. Some do not even require rinsing. I use Kookaburra Scour as often as I do Orvus Paste. It is a plant-based product containing no peroxide, alkali, phosphates, or enzymes and is safe for your septic system and the environment.

Water considerations

Another consideration is the water. Hard water can leave your fleece feeling harsh. Most grocery stores have water softeners available in liquid form to add to your laundry, and they work well with just a small amount added to the washtub. If your water is hard but you have a water softening device added to your water system, this additive is unnecessary.

Organizing

To help prevent felting and to keep the wool well organized, I use mesh bags to wash my fleece. These can be purchased inexpensively from discount stores. They have zippers and are generally used for washing lingerie. I usually put 6 to 8 ounces of wool in a bag. Using the bags helps prevent agitation, as the bags can be lifted in and out of the sink easily. They can also be hung over the sink or tub to drip so that you are not tempted to squeeze or wring the water from the fleece, as that action would most certainly create some degree of felting.

Washing instructions

To wash wool, place 6 to 8 ounces of wool in a zippered lingerie bag and immerse it in a tub of very hot water (125˚F) with Kookaburra Scour or Orvus Paste (use the amount of formula as directed on the product). Let the wool soak for 15 minutes. It is important not to let the water cool significantly because this could cause the lanolin to reattach to the fiber. Lift the bag in and out of the water a few times during this 15-minute soak, without agitating the wool. Allow the water to drip from the bag while filling the tub again with the same temperature water (I hang the bag on a hook above my sink). When washing a fine fleece, do a second wash with a small amount of wool scour and let it soak once again (lifting the bag occasionally and placing it back in the tub). Finally, hang the bag again and let the water drip from the bag while you fill the tub for the last time with equally hot water. Place the bag in the rinse water and lift it in and out of the water several times during a 10-minute soak to see how clear the rinse water is. This one rinse should be sufficient to remove any remaining dirt and scouring agent. If the water is still murky after this first rinse, then you should do one additional rinse. Allow the liquid to drip for about 30 minutes for the last time, remove the clean fiber from the bag, and set it on a towel or rack to dry completely—remember that drying time will vary depending on your climate. ⌘

Robin Russo lives in Bradford, Vermont, where she teaches spinning, dyeing, felting, and working with exotic fibers. She has taught at numerous gatherings of spinners, weavers, knitters, and historical societies. As a fiber enthusiast for more than forty years, she takes every opportunity to explore its potential.

Choose a flick carder that feels comfortable in your hand. **(1)** Schacht. **(2)** Patrick Green. **(3)** TeKotero. **(4)** Louet. **(5)** Unknown brand.

Flick Carding

By Carol Huebscher Rhoades

A flick card (sometimes called a flicker) looks like a small flat-back handcard with a smaller surface for the carding cloth and a slightly longer handle than that of a handcard. Its purpose is to quickly open up locks of wool. Flick-carded locks can be drafted and used directly for knitting, crochet, or as weft in weaving. You can also spin from the ends or the fold of flicked locks to produce semiworsted yarn, or prepare the locks further by hand- or drumcarding. No matter what your purpose is for flick carding, the one phrase to keep in mind throughout the process is "light and easy."

If you are planning to flick card regularly, then I highly recommend that you purchase a tool designed for the purpose. Fibers chosen for flicking should be at least 4" long and those fibers are usually coarser than shorter fibers. Most animal combs (dog combs often substitute for flick cards) are designed to remove an undercoat of short, soft hair. The carding surface is small and the teeth are short. Flick cards have teeth about ½" high and they cover a surface 1¾" to 3" long and 3½" wide. With a flick card, it is easy to "flick" through the narrow lock of long wool

and open up half a staple at a time. A dog comb is more useful for gently flicking open a fine, short-staple fiber.

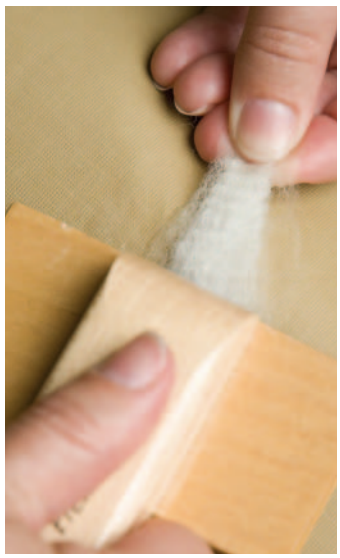
My favorite flick card is the standard width but has only 11 rows of teeth. It is lightweight—2.8 ounces compared to another card with 18 rows of teeth weighing 6.3 ounces. The small size doesn't stress my hands and wrist as I flick; the heavier card tends to fall into the fiber, meaning that I drag rather than sweep it away at the end of the stroke and remove more fiber than intended. Try out several models and choose the one that feels comfortable and does the job most efficiently. An additional item useful for flick carding is a piece of leather to flick against; however, I normally use a piece of heavy card stock paper to protect my thigh and clothing.

Many fibers from fine to coarse, especially wool, are suitable for flick carding. "Light and easy" is also the key here. Choose a long-staple fleece that is free of vegetable matter, manure, and matting. A fleece with distinctive locks is easy to separate for flicking, and a nongreasy fleece will be easier to wash.

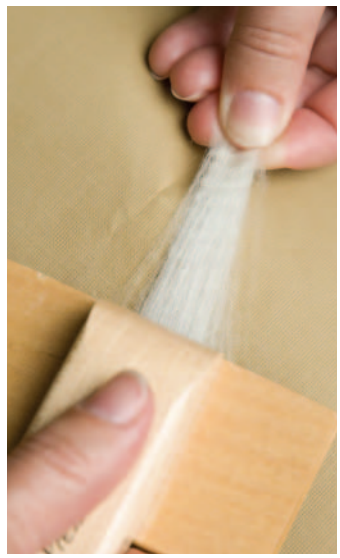
When I plan on flick carding, I separate bundles of four to six locks and align them so all the tip ends face the same direction (locks or staples usually end in a tip separating one lock from another, so use the tips to sort locks). I then put 1 to 2 ounces of locks into a small net bag (small onion bags work well), close the bag ends, and wash the fleece with wool wash in warm to hot water (the finer and greasier the wool, the hotter the water). After five minutes, I support the bag from underneath, lift it from the water, roll it down the length to squeeze out some water, and then rinse the wool two or three times in the same temperature water. After squeezing out the water for the last time, I remove the locks from the bag and separate them into thin layers to dry.

Once the locks are completely dry, I separate the bundles into individual locks. Wool with pointy tips makes this easy. For blocky wools (where individual tips are not easily distinguished), I separate the fiber into thumb-width segments. It is easiest to flick a small amount of wool at a time. The idea is to flick through an end with one quick downward stroke; switch ends and flick. If you can't flick through the width completely on the downstroke, then you have too

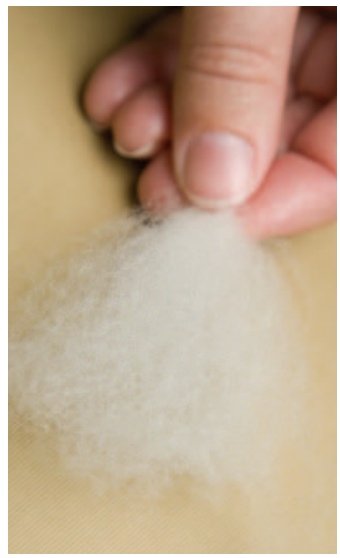
Before you begin flick carding, find a comfortable place to sit and cover one thigh with a piece of leather or card stock. I hold the flick card with my right hand and the fiber on my left thigh. To avoid losing a lot of fiber, always hold the lock against your thigh, not up in the air.



Grasp an end of the lock firmly between your thumb and forefinger and hold it down at your thigh. Make sure you have control of all the fibers. Hold the flick card, teeth downward, in the palm of your dominant hand, with your fingers curling around the handle and your thumb across the handle near the base of the card. That will keep the card steady as you work.



Starting with the card 4"–5" above the lock, flick downward into the lock with a quick wrist motion. Since I am right-handed, my wrist rotates counterclockwise; left-handers rotate the wrist clockwise. Once the card hits the locks, it should open up the top two-thirds of the staple and then sweep neatly away from the fiber.



The end of the lock should now be a fan of separated fibers.

Safety Make sure your tetanus shot is up to date before flick carding. It is easy to miss the fiber and nick your hand, so work carefully. Immediately wash any cuts with antibacterial soap.

much fiber. If there is any matting in the fiber, open the ends by hand before flicking. The card should move smoothly and easily through the locks.

If your fibers are well chosen and clean, then flick carding through the locks should be very fast. If you find that you have to do two or more passes for each end, then you probably have too much fiber (the lock is too wide and/or thick) or the locks have some matting. It is better to open recalcitrant locks by hand than by flicking. Flicking at mats removes too much fiber and can damage the carder teeth. For long but fine fibers, such as Bluefaced Leicester or suri alpaca, open about an inch of length at a time, and move up the fiber until the entire lock is open. You might also remove too much fiber and damage the ends if you repeatedly pat at the fiber with the flicker.

The flick card will remove some short fibers. If you find a lot of longer fibers in the teeth, then you might not be holding all of the lock at one end or are not holding it firmly enough. Be careful though—a death grip on either the lock or the card is not good for your hands and wrist.

If you are not sure you want to invest in wool combs, flick carding offers a quick and inexpensive way to prepare wool for worsted-style yarns. You can spin from the ends or the fold with a short forward draw for smooth, dense yarn that will still have some loft. I usually spin the locks with a backward draw for a more woolen-style yarn. ⌘

Carol Rhoades lives in Madison, Wisconsin, where she spins all sorts of yarn for winter woollies.

I always flick the tips first and then the cut ends, and I arrange rows of locks in a long, shallow box with all the tips facing the same direction. You may want to put tissue paper between the layers, particularly if you won't be spinning right away. Don't stack the layers too high or the bottom ones will be squashed.

To flick the opposite end of the lock, neatly "close" the fan and grasp that end as for the opposite one; flick the fibers as before.

This is an example of too much wool.

The Handcarding Process

A BOOK EXCERPT from ***Spin It:*** *Making Yarn from Scratch By Lee Raven, Edited by Traci Bunkers* (Interweave, 2003)

You'll be able to find handcarders in spinning and weaving shops, or by mail order from *Spin·Off* or other fiber magazines. You'll often be given a choice between straight-backed carders or curved-back carders, and between wool carders or cotton carders. For your first pair, I suggest that you get curved-back wool carders. The curved backs will give you precise control during the carding process, and the wool carders (also called wool cards) handle a wide range of fiber types and diameters. Later on, when you want to experiment with carding and blending short delicate fibers like cotton, some of the silks, cashmere, and Angora rabbit, you'll want to invest in cotton carders with finer closer-set teeth.

The purpose of handcarding is to open, separate, and straighten the wool fibers. The product is a small batt or rolag of wool whose openness and loftiness makes your drafting much easier. Handcarding also gives you greater control in spinning the woolen yarn you desire. Woolen yarns are warm because air is trapped among the fibers; they are fuzzier at the surface than worsted yarns, and they're generally softer and loftier. Woolen yarns are excellent for knitting and crocheting and as the weft yarns in weaving.

The first thing to do is charge a handcarder with wool. Take one carder in your left hand, palm up, with the handle pointing away from you and the wooden back resting against your leg (wire teeth pointing up). This left carder will remain stationary while the other carder does the work. Take a little clean wool in your right hand and begin pulling it across the teeth of the left carder from the handle end toward the front end, so that the fibers are just held by the teeth. Load it until the teeth are barely obscured—you can card a thin layer more efficiently and evenly than a thick layer. Fiber ends should extend beyond the front edge of the carder, but they should not extend beyond the teeth at the handle end.

Now take the other carder in your right hand, palm down, with the handle toward you and the wood back facing up. You are going to brush the wool on the left carder with the right carder, using a gentle rocking motion, so that the teeth at the handle end of the right carder engage the wool first. As you rock through and brush back, the front teeth engage the wool last.

When you get to the point in your stroke where the teeth meet, avoid pulling down and through so that the teeth interlock and end up scraping past one another. Instead, just pull back and through so that the teeth barely touch as they pass.

On your successive strokes continue the rocking motion as you brush the wool. Brush the wool that lies on top of the teeth, not the wool imbedded in the teeth. If you mesh the teeth of the carders together and forcefully pull them past one another, you will end up tearing and


1

Charge the carder by taking a handful of wool and pulling it across the teeth of the carder. Do this gently; brush the wool across the teeth and let them grab a part of it.


2

Repeat until you have a thin, even layer of wool across the carder.


3

Begin to card by taking the other carder in your right hand. Use a light, rocking motion. The tips of the teeth on the carders should not meet.

breaking the delicate fibers. You will also put excessive wear on your carders.

It will take about five to ten strokes to transfer the wool from the left carder onto the right carder. When all the wool on top of the teeth has been carded, and both carders look equally charged, it is time to start lifting and brushing the remaining fibers from the teeth of the left carder as they transfer to the right carder.

Transfer the wool from the left carder to the right carder by starting at the front edge and engaging the fiber tips hanging off the front end of the left carder as before, but do not stroke back. Instead, rock the right carder forward, meshing some of the teeth of the two carders together (but not scraping them past one another). Lift the right carder from the handle toward its front edge as you pull through and complete your rocking stroke—the engaged fibers from the left carder will lift from the teeth and surface of that card and transfer to the right carder. Continue this rocking, lifting, brushing motion as you overlap the carders more and more. In the end, all the fibers from the left carder should have transferred to the right carder.

You need to go through the whole process once or twice more, or as many times as necessary to open and brush the fibers into a completely uniform mass. To start again, transfer the fibers on the right carder back onto the left carder as follows. Turn the right carder face up. Holding the carders perpendicular to one another, begin to lift the fiber ends extending from the front end of the right carder with the back teeth of the left carder. When the front end of the right carder meets the middle of the left carder, push the teeth of the carders together briefly so that the teeth of the left carder can get a better grip. Then you can continue to gently lift the fibers from the teeth of the right carder. All the fibers should now be resting lightly on top of the left carder (you may have a line of fibers down the middle that are more imbedded in the teeth). Now you just have to secure the fibers in the teeth of the left carder, which you can do by pressing them down with your hand, or with the back of the right carder.

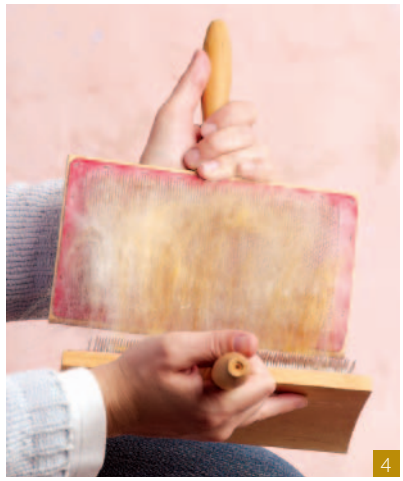
Repeat the carding process as described until the fibers are straight and uniformly opened. Generally, two or three times through is sufficient.

To remove the wool from the right carder when you are finished, just lift it as you did before with the teeth of the left carder. You can then use the teeth of the right carder to lift any remaining wool from the left carder to be sure all the fibers are free. This time, though, there is no need to dig the teeth in for a better hold. You should now have a little batt of wool resting freely on top of the teeth of the right carder.

Starting with the fiber tips farthest from you, start rolling the wool jellyroll fashion toward you. As you roll with your fingers, keep the ends of the roll from expanding by controlling them with the heels of your hands. When you have the cigar shape completely rolled, pick it up, place it at the end of the carder farthest from you again, and once more roll it down toward you with just a bit of pressure. This second roll will help compact the rolag and seal the free edge of the roll so it holds its rounded shape.

You can make a basketful of rolags at your leisure, and then sit down to spin. Pick one up, join the fibers from one end to your leader, and begin spinning. When you near the end of one rolag, pick up another, make a good join with the first, and continue.

Once you understand the basic carding process you will begin to see all sorts of possibilities for blending colors on the carders. You can thinly layer the colors on top of one another or place them side by side. Card thoroughly for a uniform blend and a heathered effect in your yarn. Card less completely for a stippled effect. Or make a basketful of colored rolags that you pick up randomly and spin for a variegated effect. ⌘



4

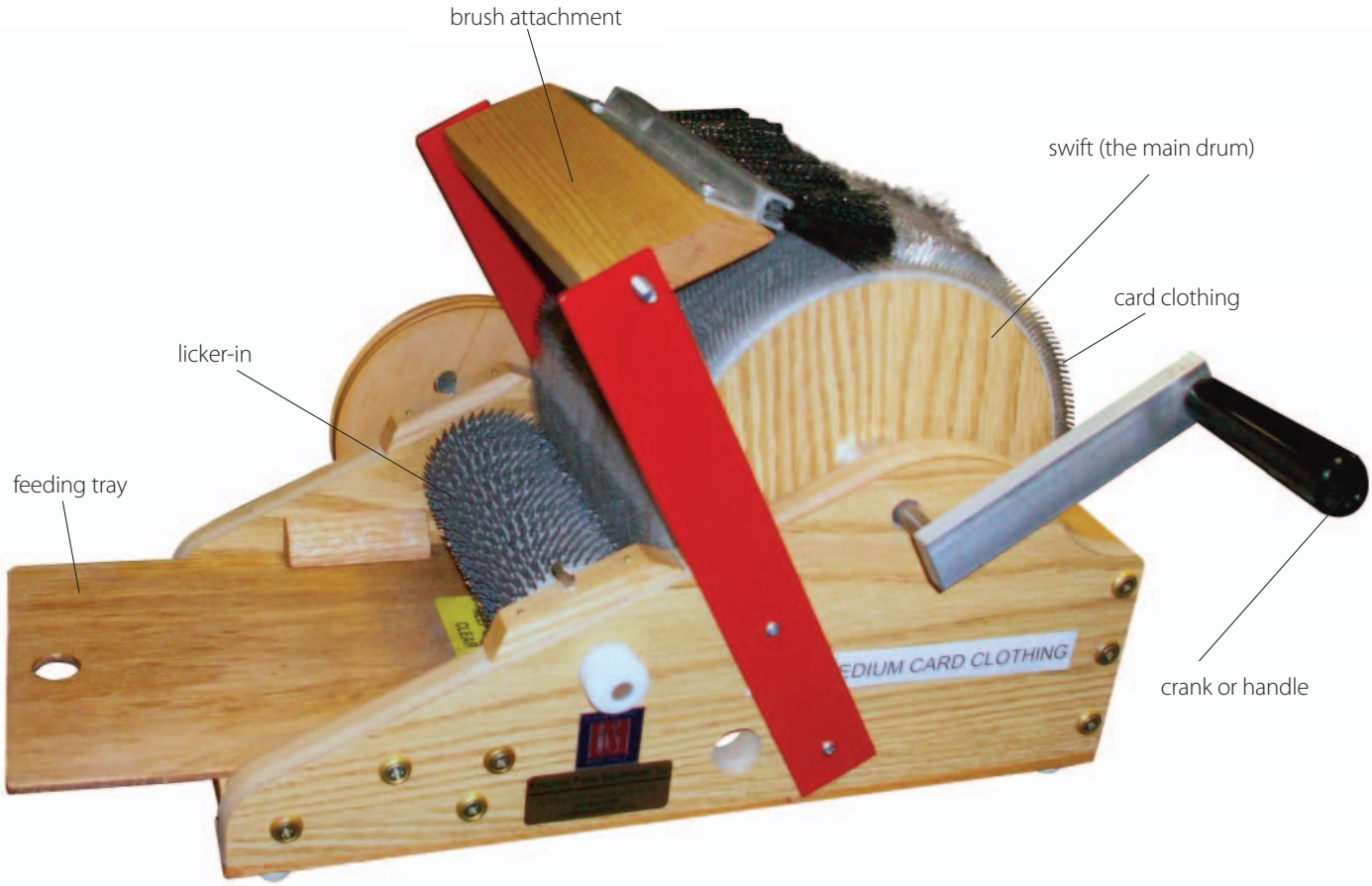
When your wool appears to be evenly divided between the carders, you will lift and transfer the remaining fibers on the left carder to the right carder

5

The fibers will end up resting lightly on the left carder.

6

Use the edge of the right carder and your left hand to start rolling the rolag.



Drumcarding

By Robin Russo

As a new spinner, I found handcarding for large projects to be a tedious task. I began to purchase roving and top to avoid the carding process but was soon dissatisfied with both the spinning and knitting of those prepared items. Then in 1978, my sisters, my daughter, and I entered a sheep-to-shawl competition and won a Patrick Green drumcarder. This event changed my outlook forever. I now view the purchase of fiber and its preparation to be as much a part of the journey as the spinning and knitting.

Carding is a process of brushing clean fibers over opposing sets of short wire teeth (card clothing) to open and separate the fibers into a uniform mass. This can be accomplished with a set of handheld cards, a small tabletop drumcarder, or a very large industrial carding machine. The size of your carded mass will be determined by the size of the carding device you are using. Carded fibers produce woolen yarns that are soft, lofty, fuzzy, warm, bouncy, and lightweight. However, woolen items made from these yarns have a tendency to pill because of short fibers that are not secured in the spun yarn and so stick out of the woolen yarn. In worsted-spun yarns, the fibers are tucked inward as they are spun.

Understanding your drumcarder and what it is capable of is important. Here are a few things to look at.

Card clothing (wire teeth)

Examine the wire teeth on the drum. Are they tall or short? Set close together or far apart? I have counted as few as 48 and as many as 240 wires per square inch of card clothing on the various devices I own. Short wires, set close together are best for fine, shorter fibers. Wires set farther apart are best for longer, coarser fibers. The taller the wire, the more fiber the device can hold. Manufacturers generally say how much fiber a particular carding machine can hold, but it is easy enough to figure that out by trial and error. Once

the drum is full, it will begin to put fiber onto the licker-in. The licker-in is the small cylinder on the drumcarder that draws the fiber onto the main (larger) cylinder. When that happens, stop carding. The licker-in should only have short noily fiber on it. You can also see when the drum has reached its capacity. The drum is full when the fibers uniformly blanket the teeth. If carding continues when the drum is too full, the fiber will transfer back onto the licker-in, which is counterproductive.

Drum adjustment

Are the drums adjusted properly? Do the teeth mesh together or do they just barely touch? The manufacturer may tell you what the adjustment should be on the equipment, but if not, you must make this determination yourself. Most carding machines have screws or wing nuts that can be used to adjust the drums. The teeth should not mesh, but should touch slightly. I refer to it as "kissing." Some manufacturers recommend slipping a piece of paper between the drums to determine the correct distance.

Oiling

Oiling should be done according to the manufacturer's specifications. If you do not have a guideline, look for oiling ports (small holes located near the metal rotating assemblies). Plastic and nylon sleeve bearings generally do not require lubrication. It is best to ask the manufacturer about oiling before you do so, just in case there are parts that can be damaged by the oil. I use automotive motor oil because it has a thicker viscosity than 3-in-1 oils or sewing machine oils that have a tendency to run.

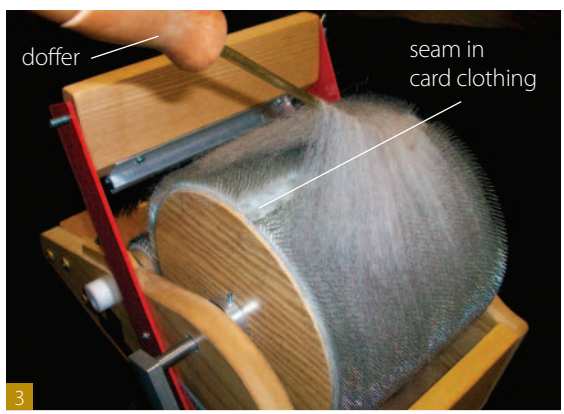
Drive band

On carding machines with a rubber or urethane drive band, I remove the drive band when it is not in use to prevent it from "taking a set" (permanent stretching). Also, be sure drive bands are wrapped correctly before you card.

Carding process

Following a few simple rules will help you produce beautiful, carded batts for spinning or felting with the least amount of effort.

Fiber: Make sure your fibers are clean. This means washed, dried, and reasonably free of chaff or other barnyard materials. If you have inadvertently felted your fleece during the washing process, do not expect your drumcarder to rectify the



1) Locks and teased fiber. **2)** Teased locks being fed into carder. **3)** Use the doffer to gently break the batt apart at the seam in the card clothing. **4)** Roll the batt off the drum using a paper towel tube. PHOTOS BY ROBIN RUSSO

problem. Putting felted or very dirty fiber through your drumcarder only puts stress on the wires of the card clothing, making it difficult for the carder to produce a good batt. Bending the wires will adversely affect the look and quality of your batts in the future.

Picking: Pick or tease the fibers so that the locks are thoroughly opened up. You can do this by hand or with a picker. This is not as time consuming as you might think (unless you have felted the fiber in the washing process!). I put my wool in a box on the floor in front of my chair, and while I am watching the news, I pull the fibers apart *without* even looking at what I am doing. By the time the news is over, I have a very full box of fluffy fibers. This is especially important if you are blending two or more different types and/or colors of fiber. Mixing them up at this stage saves lots of time at the drumcarder. Remember to weigh out your amounts so that future batts will have the same proportions as the first.

Feeding: Place small amounts of fiber onto the tray that feeds the fiber under the licker-in, or small drum. Do not hold this fiber back by placing your hand on it. This will make the fiber wrap around the licker-in. The only fibers that should accumulate on the licker-in are the short, noily fibers that you do not want on the main drum. If you have overloaded your tray, stop turning the drum, pull back some of the fiber, and then begin carding again.

Removing the batt: When the drum is full, remove the batt. Look for the break in the card clothing on the large drum and move it to the top position. Place your doffer (the tool that looks like a thick ice pick) at an angle into the break and gently rock it up and down, breaking the batt apart as you head toward the far side of the drum. Once you have reached the far side and the batt is broken apart, use a paper towel tube or foam pipe insulation (cut to the width of the drum) to wrap the carded batt around as you roll it off the drum. If I have very fine, catchy fibers in my batt, I also use a piece of tissue paper, winding it on the tube with the fiber to prevent the fibers from sticking onto one another as the batt is rolled off the drum. Hold the tube or insulation against the teeth as you roll, and this will do a great job of picking up the majority of fibers on the drum. If you don't have a tube to roll the fibers onto, gather the "cut" edge of the batt and roll the drum forward so the batt is close to the wooden frame of the carder. If you pull the batt off against the frame, it will usually wind off smoothly.

Round two

Break down your batt into three or four lengthwise strips or layers and feed each piece back into the drumcarder. If you want to blend the fibers from several batts, feed three or four strips (each from a different batt) for the new batt.

Finish

If your fibers are clean and well picked, your batt may be ready for spinning. Hold it up to the light and see how uniform and clean it is, making sure there are no noils or inconsistencies. If you are not satisfied, divide the batt into three or four pieces again and repeat the process. If your fibers are well teased, this third round should be sufficient to obtain a batt worth spinning.

When you sit down to spin, you will know if you did a complete enough job. Well-prepared fibers spin easily into beautiful, consistent yarns. If your batts become disorganized during the spinning process, simply put them through your drumcarder again to freshen them for spinning.

Batts for felting

I use the same techniques for creating felting batts as I do for spinning, although felting tends to be more forgiving of any inconsistencies that may occur. The drumcarder is an essential tool for organizing the bits and pieces of fiber you create to lay out for a felting project. ⌘

Robin Russo lives in Bradford, Vermont, where she spins, knits, felts, and explores fibers and their many uses. She and her husband, Pat, also manufacture a line of products for handspinners. Over the past twenty years, Robin has taught at numerous gatherings of spinners, knitters, weavers, felters, and historical societies. When she isn't working as a paralegal, she enjoys spending time with her friends and family working out some new fiber-related idea. She has three sisters, a daughter, and numerous nieces who all spin, knit, felt, weave, and love to play with fiber.

Minicombs

By Carol Huebscher Rhoades

Many spinners prefer spinning short forward draw from combed fiber to produce worsted yarns that are dense and smooth. However, many may not want to invest in the large wool combs necessary for preparing top at home. Minicombs and flick cards make it fairly easy to prepare locks of fiber for spinning yarns that are not quite as dense or smooth as true worsteds spun with short draw. I consider yarn spun short draw using these preparations to be semiworsted. Because not all short fibers are removed, the yarns may have a bit of loft not normally found in a true worsted. Nonetheless, these yarns are denser and less fuzzy than the typical woolen yarn because the fibers are kept relatively parallel during preparation and spinning.

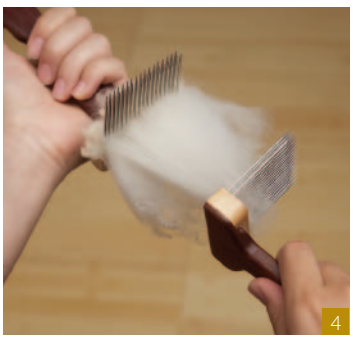
There is disagreement among the experts about what preparation precedes short-draw spinning to achieve semiworsted yarns. Mabel Ross defines semiworsted yarn as "spun by the shortdraw method (including 'point-of-contact' style) but from medium length fibres either not truly parallel, or containing short fibres amongst the long."[1] She lists drumcarded roving and rolags rolled so that the fibers remain parallel in addition to flick-carded locks as semiworsted preparations. Anne Field simply says that "semi-worsted yarn has the preparation of a woolen and the spinning method of a worsted yarn."[2] Alden Amos suggests spinning combed locks or sections of sliver from the fold for a semiworsted yarn.[3]

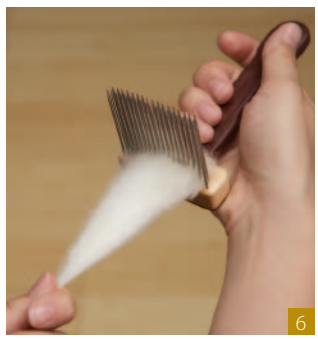
Minicombs are handheld tools with one or two rows of tines about 2 inches long. The combs are 2½ inches wide so only a small amount of fiber is processed at a time. The tines may be straight or slightly curved toward the handle. There are several brands of minicombs on the market. Since they can cost upwards of $75, it is worth trying out several models if possible to find a set that feels comfortable in your hands. Some models are designed so that the passive comb can be mounted, which can aid in removing the fibers. For the smoothest roving, use double-row minicombs.

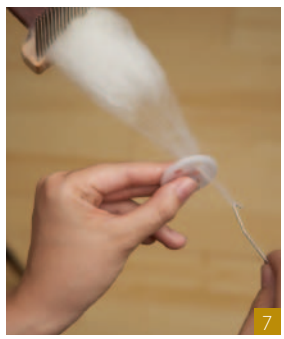
For a smooth but somewhat lofty semiworsted yarn, choose a clean fine to medium fleece with well-defined locks 2 to 4 inches long. Long and coarse fibers can be difficult to control and may bend the tines out of shape. Wash the fleece so that the locks remain intact. I place about 1 ounce of locks, with all the tips facing the same direction, into a plastic net bag about 6" × 12". Secure the open end of the bag and submerge it in warm to hot water (the greasier the fleece, the hotter the water should be) and woolwash. Between rinses, lift the bag out, roll it up, and gently squeeze out excess water. To lay out the wool for drying, remove layers of fiber from the bag so that the locks stay parallel. Once the wool is dry, separate it into small groups of locks. Fibers other than wool should be washed and/or arranged in a similar manner. To protect the tines from bending, use only fibers that are easily opened. If necessary, open tip and cut ends by hand, working from side to side of the lock to maintain lock formation.

1. To load the combs, catch the cut (butt) end of the barely separated fibers (too much teasing and the lock structure is lost) in the tines so that only a very short length appears at the back (near the handle). **2–3.** Layer the fibers until they cover about half the height of the tines. Be sure that the fibers don't overflow at the sides of the comb. With the empty comb's tine tips, lift the fibers away from the base of the tines. Keep the fibers away from the base as you work. If there is resistance as you comb, remove some fiber. Combing should be smooth and easy.

[1]Mabel Ross, *The Encyclopedia of Handspinning* (Loveland, Colorado: Interweave Press, 1988), 154. See entries on semiworsted and woolly worsted yarns.
[2]Anne Field, *Spinning Wool: Beyond the Basics* (Christchurch, New Zealand: Shoal Bay, 1995), 88.
[3]Alden Amos, *The Alden Amos Big Book of Handspinning* (Loveland, Colorado: Interweave Press, 2001), 166.







Hold the comb loaded with fibers by placing the handle in the palm of one hand and wrapping your fingers toward you over the handle. Curl your thumb around the end of the handle. I like to work with my forearm resting on a padded chair arm so that the passive comb remains steady with tines upright. The active comb is held with the tines perpendicular to the upright tines of the passive comb; the tines face away from you. Grasp the empty comb's handle in your palm with your thumb bracing against the lower edge of the wood tine base.

4. Begin combing by moving the empty comb away from you and through the outer (tip) ends of the fiber mass. **5.** The second pass goes a bit deeper into the fibers. Continue combing a little deeper in with each pass of the active comb but do not allow the tines to touch as you get close to the base of the fibers. The tines of each comb should be at a right angle to those of the other. Discard the short, dirty wool left on the passive comb. If the combed fibers are getting out of control, remove some to save for another comb load.

Reverse hands on the combs so that you can comb the fibers just transferred to the comb that was originally empty. For me, the passive comb (with the fiber) is always in my left hand and the active one is in the right hand. Don't forget to lift the fibers away from the base of the tines to prevent the teeth nicking the wood and being damaged; it can also be tricky to comb through fibers that are drooping down at the base. Comb as described above until the fibers are aligned and most if not all short fibers are removed. Usually three or four transfers prepare the fibers well.

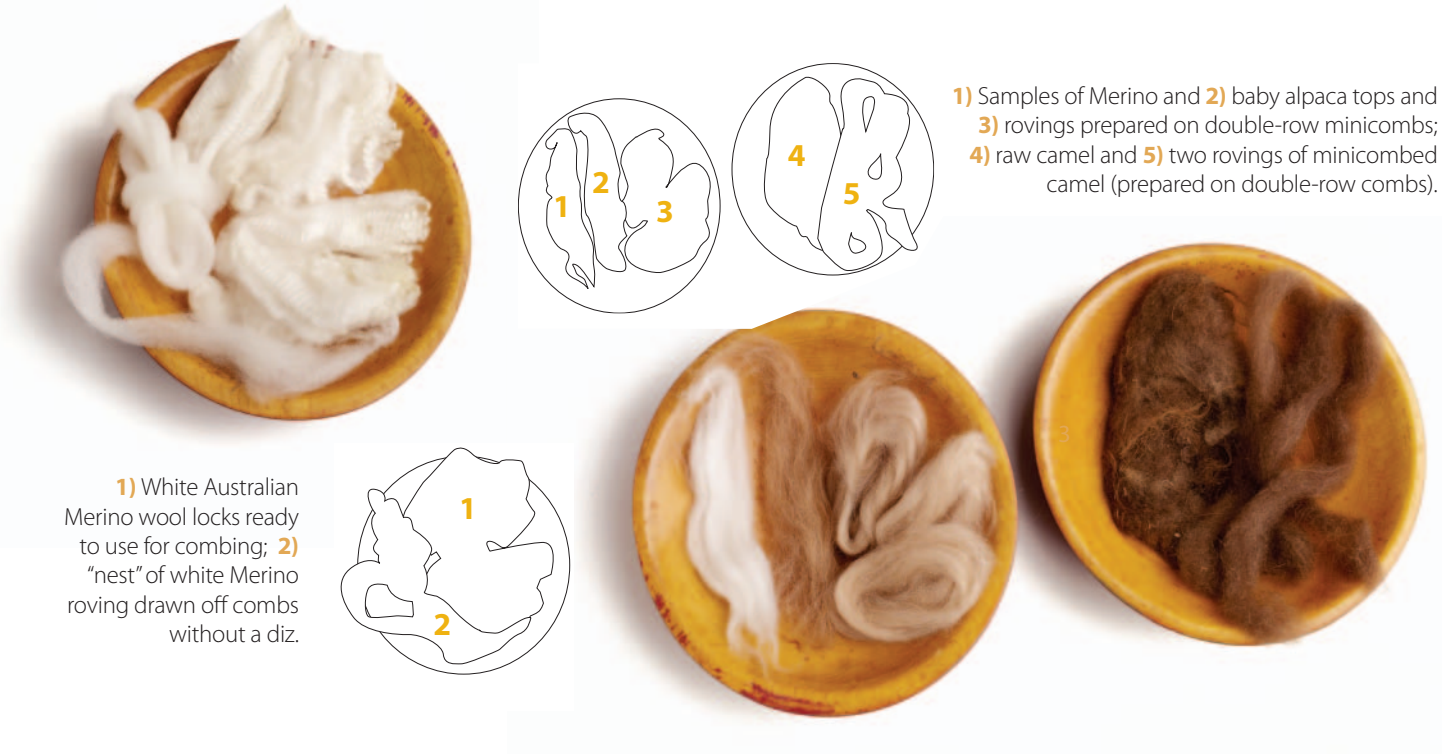
The next step is removing the fibers. Work slowly and gently—this step takes practice to produce a smooth, even sliver (an untwisted strand of prepared fibers).

6. Bring the fiber tips into a point. **7.** Gently pull the point a few inches toward yourself. For a smoother and more even sliver, pull the fibers through a diz (a disk with a small hole; a curved diz should curve toward the comb).

8–9. If possible, secure the comb by clamping it to a table so that you can pull the fibers, 1 to 3 inches at a time, alternating hands. When one hand has pulled the fiber forward, the other can move the diz back toward the comb (not too far or you won't be able to pull the fibers through). I like to pull the fiber so that it is in proportion to the desired yarn size—the finer the desired yarn, the finer the sliver. If the fiber is drafted too fine, it will

Left: Lock of Corriedale wool from Whitefish Bay Farm, Wisconsin; roving prepared on single-row minicombs with three passes and drawn off without a diz; semiworsted sock yarn spun with a short forward draw on a Schacht wheel at a ratio of 9:1 and plied at 11:1—the result is a 2-ply yarn, 15 wraps per inch, about 1,520 yards per pound.

Safety Minicombs, while small, can be dangerous. Be sure they are kept out of the reach of children and do not leave them out with tines pointed upward. Work carefully so that you don't stab yourself with the tines, and keep your tetanus shot up to date just in case an accident occurs.



1) Samples of Merino and **2)** baby alpaca tops and **3)** rovings prepared on double-row minicombs; **4)** raw camel and **5)** two rovings of minicombed camel (prepared on double-row combs).

1) White Australian Merino wool locks ready to use for combing; **2)** "nest" of white Merino roving drawn off combs without a diz.

just drift apart and if drafted finer than your desired yarn, you will have to spin multiple slivers together to get the thicker yarn desired. The preparation may take more time, but the spinning will be a breeze.

You can let the sliver drop into a smooth box or basket or onto the floor as you work. When all the fiber has been removed, except for noils or tangled fiber at the very end (discard those bits), roll the sliver around your hand into a little nest. As you do this, you add a small amount of twist. Now you have a roving from which to spin.

Minicombs can also be used for blending. **10.** Alternate layers of the fibers to be blended, making sure you don't overload the comb. I find it is easiest to blend fibers of equal length and diameter. If the fibers are not the same length, the longer ones will draw off first and your roving will have mostly the longer fiber in the first half and a mix of primarily shorter fibers in the second half. You may need to do an extra transfer or two for a thorough blending or very little combing if you start with already combed top. If you have single- and double-row combs, you can do a "rough" combing with the single-row combs and then finesse the blend with a transfer or two on the double-row combs.

While minicombs won't separate coarser from finer fibers in qiviut, cashmere, camel, or buffalo as well as commercial processes do, they certainly are more efficient for the task than removing the fibers by hand. If you have trouble spinning fine, slick luxury fibers from the locks, combing them for two or three transfers will make it easier to draft the fibers when spinning.

The keys to successful minicombing are clean, open fiber in small amounts and gentle work. You can spin wonderful yarn from this preparation: smooth and even but with a nice hint of loft. ⌘

Carol H. Rhoades of Madison, Wisconsin prefers woolen yarns for knitting but has to concede that semiworsted preparation and spinning yield lovely sock yarns. She'll need lots more socks soon.