L-2341

Texas Agricultural Extension Service

Wool Facts

Ann Vanderpoorten Beard*

Wool has more desirable characteristics than any other fiber. It is easy to spin, lightweight but strong, and lasts nearly a lifetime. Wool is the most versatile of all fibers. It can be made into a wide variety of fabrics for almost every use. Lofty, thick yarns result in fabrics that are warm in winter; fine, smooth yarns produce fabrics that are cool in summer. Coarse fibers and yarns are used for carpets and rugs, fine ones for delicate scarves and other apparel. Wool is absorbent, flame resistant, static resistant, and holds its shape well. No wonder wool is the fiber of choice for apparel designers.

The use of wool for textiles began at least 8,000 years ago, making it one of the oldest known fibers. The art of spinning wool by hand was discovered around 3500 B.C. Since then, wool production methods have evolved until the present period in which high speed machines now process the fiber for fabrics. The development of new finishes now give wool even more desirable properties. But the basic fiber characteristics that make wool fabrics preferred above others remain the same.

Characteristics

Wool is slow to absorb drops of water but quickly absorbs moisture vapor. This characteristic helps wool fabric to shed rain and snow. However, wool can absorb up to 30 percent of its own weight in moisture without feeling damp.

Wool's ability to trap air and hold moisture without feeling damp are the reasons wool fabrics are comfortable all year long. The fiber acts as a temperature regulator. In warm weather, wool fabrics absorb perspiration and in cold weather they absorb moisture from the air. In both cases, a layer of dry air is held next to the skin. Wool is a wonderful insulator and the best protection from hypothermia, the sudden drastic lowering of body temperature when exposed to moderate or low temperatures.

Because wool contains moisture, it is the only inherently flame resistant natural fiber. Wool usually smolders or chars instead of bursting into flame or

PURE WOOL

The sewn-in Woolmark label is your assurance of quality-tested fabrics made of the world's best... Pure Wool.

* Extension clothing and textiles specialist, The Texas A&M University System.

* The Woolmark® is a registered certification mark owned by The Wool Bureau, Inc. and may be used only with permission.

melting. Wool will burn in an intense fire, but under most circumstances wool self-extinguishes. That's why wool blankets are recommended for putting out small fires.

Wool resists static build-up because it holds moisture inside the fibers. This means that garments do not cling or bunch up during wearing.

Wool dyes easily and holds color well because a chemical reaction takes place within the fiber itself, making the color a part of the fiber. Wool can be dyed without the use of mordents or other chemicals needed to fix color in many other fibers.

Fibers of wool are coiled like springs. Because of this unique fiber characteristic, wool fabrics resist wrinkles and return to their original shape after a rest. This is also why wool can stretch up to 30 percent of its original length and still bounce back to its original shape. The coiled fiber gives wool loft and resilience, making it resistant to compression.

When exposed to heat, moisture, and friction, wool felts. This characteristic allows for many different fabric finishes from fine, smooth broadcloth to thick, dense coat fabrics. Most wool garments require dry cleaning to prevent felting.

Wool is stronger in use than tests of individual fibers would suggest because wool has the ability to distribute stress evenly throughout the yarns.

Science now makes wool permanently moth resistant. Special chemicals added to the dye bath are absorbed by the fibers to become a lasting part of the wool. Without treatment, wool is subject to damage by moths and other insects.

Wool is serviceable, meaning it wears well. Wool garments are durable, long-lasting and give value for cost so that money spent on classic styles is a good investment.

How a garment looks and feels depend a lot on the fiber and fabric "hand." Wool has the elusive quality that designers call a good hand, meaning good resilience and softness, resulting in a pleasant appearance and touch. Wool also has good draping and molding qualities, allowing its use in many different styles of garments.

Classification and Processing

As it is taken from the sheep, raw wool is classified into grades according to the average diameter and length of the fibers. The grade determines the end use of the wool.

Fine wool has an average fiber diameter of 17.70 microns (0.0007 inch) or under to 22.04 microns (0.00088 inch). Medium wool has an average fiber diameter of 22.05 to 30.99 microns (0.0009 to 0.00123 inch). Coarse wool is a fleece with an average fiber diameter of 31.00 to 40.20 microns or over (0.00124 to 0.0016 inch).

From 30 to 70 percent of the weight of raw wool comes from grease and impurities. Scouring, or washing the fleece removes grease, vegetable matter and other impurities. (The grease is unrefined lanolin and it is separated from the wash water for use in many products.) After scouring, the wool may be dyed. If not dyed now, dye will be added after it is spun into yarn.

The scoured wool is carded and may be combed. Carding blends the fibers, removes vegetable matter, and straightens the fibers so they lie in roughly the same direction. Combing removes short fibers or noils and further straightens long fibers.

Ordinarily, wool yarn is spun from several different lots of wool to obtain various color mixes and to maintain uniformity of quality. Wool yarns and fabrics are manufactured on one of two systems, the woolen system or the worsted system.

Woolen yarns are made of carded wool that has not been combed. Coarse wool and shorter fine wool fibers are used for woolens. Woolen yarns are not twisted tightly, giving the fabrics a soft surface texture that does not show the weave of the individual yarns. Woolens are better insulators than worsteds because of trapped air, but they are not as durable. They are used for carpets, sweaters and bulky garments and woven fabrics such as tweeds, meltons, hopsacking and fleece.

If the wool has been both carded and combed, the yarn is worsted. Worsteds are made from longer fine wool fibers. The yarns are twisted more tightly than woolen yarns, making them stronger and making the fabric structure more visible. Worsteds are lighter in weight, smoother and more durable than woolens, but may become shiny with use. Worsteds are used for suit

and dress fabrics such as challis, serge, crepes and gabardines.

Care

Wool garments made of woven fabrics require dry cleaning unless the fibers were treated with a very thin resin before spinning. This treatment eliminates the friction between fibers and allows machine washing and drying of wool fabrics. The Wool Bureau, Inc. sets standards that washable wool fabrics must meet to be labeled Superwash®. Not all washable wools will carry the Superwash® certification.

Knitted wool garments usually may be hand washed and dried flat after being patted into their original shape. Wool fibers are weaker when wet than when dry, so improper handling can distort the shape and damage the fabric. Recovery from stress takes place faster when the wool is damp, which is the reason wool should always be pressed with steam.

Wool fabrics for home sewing should be pre-shrunk to prevent possible shrinkage after the garment is made. Ready-made wool garments usually are made from fabrics that have been sponged or steamed to pre-shrink them.

A little care can maintain wool for years. Give wool clothing a 24-hour rest between each wearing. Store wool garments in a well-ventilated closet. Hang woven garments on well-padded hangers; fold knitted garments and store flat. Brush wool clothing to remove surface soil. Refresh wool garments by hanging them in a steamy bathroom to remove wrinkles. If wool gets wet, dry it at room temperature away from heat. If there's a nap, brush with the nap to restore appearance. Remove spots and stains promptly.

Importance to Texas

Wool production is economically important to Texans. Texas produces most of the fine wools in the United States. The two primary breeds of sheep producing fine wool in Texas are the Rambouillet and the Delaine-Merino. Wool from these two breeds is considered the most desirable in the world.

Wool is a natural, renewable resource. Sheep find adequate nourishment on marginal land. Sheep can thrive in the most extreme climates and can graze on weeds that other animals will not eat.

After shearing, fleece grows back. In about a year the sheep can be sheared again, and the process repeats itself throughout the sheep's lifetime, producing fine wool year after year.

In 1988, Texas produced 18,200,000 pounds of wool from shearing 2,500,000 sheep. The average price per pound for the wool was $1.97, making the total value of the wool $35,854,000.

Definitions

Lamb's wool is very soft, with superior spinning qualities, and comes from an animal not more than seven months old that has not been shorn before.

Recycled wool is the term for fabric manufactured from wool fabric scraps or from used wool fabrics. It often is of lower quality than virgin wool because many of the fibers are broken during reprocessing. Frequently, it is used in blends.

Shearling is soft wool pile on one side and sheepskin on the other.

Sheepskin is a general term for hide with the wool still intact on the pelt or leather.

Superwash® is a registered certification mark owned by The Wool Bureau, Inc. It appears on the label of washable wools that meet the standards set by The Wool Bureau, Inc.

Virgin wool has never been used before. The term does not indicate quality.

Woolmark® is the name of the trilobal symbol used on labels to signify that a product is made of 100 percent pure wool. The Woolmark is a registered certification mark owned by The Wool Bureau, Inc.

Woolens are the fabrics woven from woolen yarn, spun from fine, short fibers or coarser fibers.

Worsteds are the yarns or fabrics manufactured on the worsted system, carded and combed fibers of long fine wool.

References

A History of Textiles, Kax Wilson, Westview Press, Boulder Colorado, 1979.

"Fact Sheet 1" through "Fact Sheet 6," American Wool Council, Denver, Colorado, 1987.

Fairchild's Dictionary of Textiles, 6th edition, Isabel Wingate, editor, Fairchild Publications, Inc., New York, 1979.

"Natural Fiber Facts," Natural Fibers Information Center, The University of Texas at Austin, 1988.

"Texas Wool--Versatile Fashion," Texas Agricultural Extension Service, Texas A&M University System, 1984.

"Wool Grades and the Sheep that Grow the Wool," American Wool Council, Denver, Colorado, 1988.

The information given herein is for educational purposes only. References to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

This publication was printed with funds from an educational grant provided by the Texas Sheep and Goat Raisers' Association.

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Zerle L. Carpenter, Director, Texas Agricultural Extension Service, The Texas A&M University System.

10M– 7-89, New CLO