

Romneys to Rugs

Romneys are the Featured Breed at the New York State Sheep and Wool Festival in October 2008. This exhibit showcases the virtues and beauties of wool-rich¹ carpets and rugs; those also of Romney wool; and examples of how the industry worldwide draws on the Romney for quality and quantity of raw material.

The exhibit will look at just two facets of wool rug manufacture. One is the mechanized large-scale production in America, New Zealand and Europe of wool-rich carpets such as are found in the White House, the Metropolitan Opera House, Radio City Music Hall, Lufthansa airlines, the Hong Kong airport, the Ritz-Carlton Hotel; corporate offices (John Deere, Ford Motor.); cruise ships and (said with a shudder) gaming casinos, as well as private houses. The other facet is the mechanized but smaller-scale production in America and England of historic-value rugs and carpets for American floors like those in the John Jay House (Bedford NY); in presidential residence restorations (Mt Vernon, Monticello, Kinderhook, The Hermitage); International Tennis Hall of Fame, Newport RI; Mohonk Mountain House, NY; Kykuit, NY; Lyndhurst, NY; and the Sarah Orne Jewett House Berwick ME. We will consider both major types of machine-loomed wool-rich carpets – woven and tufted.

Justly-renowned wool-rugs like hand-knotted Orientals or hand-woven Navaho rugs are not included. These beautiful rugs don't use thousands of tons of high-quality wool each year, nor were they ever meant for heavy everyday traffic like hotel corridors. Also omitted is the production of machine-made wool-rich carpeting in Asia, notably India and China². Not covering the yarn-spinning and machine-made wool-carpet industries in these two countries, which both import thousands of tons of carpet wool

from New Zealand is not to disrespect their production or the wool they use, which is presumably an unspecified blend of domestic and New Zealand. It is just too hard to get information from them..

Wool-rich is (sadly, to a shepherd) only a small piece of the global carpet and rug industry. Before the Second World War wool had a huge share of a far smaller market. Wool was so useful to the military that the supply available for carpets dried up. This scarcity motivated the introduction to the industry in 1947 of nylon, invented only 9 years before. Now in the U.S., which makes almost half of the world's carpets and rugs, 68% of the fiber used is nylon; olefin (polypropylene) is 22%, polyester 9% and wool less than 1%. [Source Encyclopedia of American Industries Gale 2008] That wool did not disappear completely after synthetic fibers came to the U.S. carpeting industry is a tribute to its merits. Here are some:

- Wool rich carpeting is highly resistant to flame, and does not emit toxic fumes when heated.
- It keeps its beauty longer, and stays cleaner with proper care from ordinary dirt than does material made from nylon or olefin (polypropylene). Colored liquid spills do need quick attention, as wool should not be “Scotchguarded.”
- Wool is seldom allergenic. Most people who think themselves allergic to wool don't have a true contact dermatitis. Rather, their skin gets reddened and irritated by the “prickle factor” in from strong wool. Respiratory allergies triggering asthma are extremely rare, as scoured wool gives off no vapors itself and its fibrils are too big to reach the lower respiratory tract. That said, any floor covering may harbor mites or dust which can be allergenic. Weekly vacuuming and biennial cleaning are advisable for either wool or synthetics.
- Wool-rich carpeting is made from a “green” material raised literally in a green pasture, not grown in a feedlot or made from petroleum.
- It is free of volatile organic compounds unless those are used in the backing.
- It is completely biodegradable, though not literally recyclable into carpeting.
- It absorbs moisture in high humidity, gives it off in dry, thus stabilizing room climate. This has been called the “air conditioner effect.”
- Because of its intrinsic helical structure, wool recovers from compression much better than synthetics, dents less under long pressure.

- Wool does not yellow in sunlight, though dyes in any type of carpeting may change in sunlight

Where do Romneys come in ? The raw material for the highest-quality wool rugs and carpets is “strong” wool, with an average fiber diameter of 32 microns or more. Much the largest by-country share of the wool going into high-quality wool-rich broadloom³ carpets, wherever made, belongs to New Zealand, which produced 147,000 tons (clean-basis⁴) of wool in 2005-2006. <http://www.meatandwoolnz.com> Seven eighths of that wool was of average fiber diameter 31.6 microns or more, what NZers call “crossbred”. <http://www.meatandwoolnz.com/main.cfm?id=259&sid=212&id2=332> New Zealand accounts for about 50% of the world’s traded carpet wools (source: personal communication Tim Lonsdale Wools of New Zealand). Only China, with a much lower reputation for quality, could even approach that proportion.

New Zealand wool, in turn, is mostly Romney. At least 70% of the 40 million or so sheep in NZ are Romneys or first-generation Romney crosses or pure breeds (Coopworth, Perendale, Drysdale, Tukidale) that originated from Romneys. Thus the 115,000 tons (clean basis) of “crossbred” wool that NZ exported in 2005-2006 was loaded with Romney wool qualities: abrasion-resistant, white, long-staple, resilient, easy-dyeing. While these might be equaled, perhaps excelled, in carefully-selected clips from elsewhere, no other nation except the U.K. can provide even a small fraction of domestic or export demand for strong wool of this excellence.

To show the Romney to rug connection, I’d hoped to track a 4-ton lot of wool step by step from a named farm in New Zealand (home to nearly all the Romneys in the world) into, or even through, an American⁵ carpet mill, with pictures and samples.

Another idea had been to depict the flow of wool around the world into the making of wool-rich carpets.

Neither idea went very far. The clip from most NZ farms, even when very high quality, is apt to be merged in a warehouse with others. The wool manager at one big yarn mill in NZ did say he can track certain lots from the farm where he buys them to overseas carpet mills but cannot publicly name the growers. The round-the-world flow idea would have meant calling hundreds of people, only to have the findings change every year. I settled for a few examples, for qualitative more than quantitative description, for clearness (let's hope) more than precision.

The paths by which wool moves from Romneys in NZ into wool-rich carpeting are too many for quick writeup. The most streamlined is a "vertical operation," with everything from the raw wool stage onward under one roof or next door. The Karastan division of Mohawk Industries comes the closest I found in America. Karastan is the largest user of NZ wool in America and the largest processor of wool carpets and rugs in this country. Their wool arrives scoured; they do all other steps. They bring in more than 2,000 tons a year, about three-fourths from NZ, the rest from the U.K. Cavalier-Bremworth in New Zealand is a full vertical operation, but do not market to America.

Let's therefore try to follow an imaginary clip from a large NZ farm running 3500 Romney ewes. After sorting, those several tons might be sold from the shed to a yarn-mill or to a middleman like Wrightson's; or, they might be carried to an auction.

The first buyer, if not actually a scouring plant or yarn mill, might sell to one such in the same country. Lots not for scouring in NZ might be merged into a larger shipment to go in the grease to China, India, Europe or (much less) the U.S. Or, they might be

scoured (there are more than 30 scouring facilities in NZ) then shipped clean for spinning and dyeing in another country. About one tenth (by \$value ⁶) of the country's wool exports leaves NZ as spun carpet yarn, either dyed or un-dyed. Summit Wools in Ouamaru is now making five thousand tons of yarn a year, nearly a million miles. They supply several of the best-known American carpet makers. Another 13% (by \$ value) of New Zealand's wool exports move as completed carpets and rugs, mostly to Australia and the Middle East. Most exports by dollar value or by tonnage, however, are as fiber.

NZ carpet wools spun outside that country are likely to be blended with those from another source such as China (a big producer not noted for domestic high-quality wool) or Britain (a relatively small producer famed for high quality strong wools). British carpet yarn mills tend to blend NZ wool with British carpet wools from breeds like Hill Radnor, Swaledale and Scottish Blackface as well as British Romneys. They find this increases resilience or "bulk," the ability to spring back after long compression like that a chair leg delivers. Many American yarn-spinners also blend these two streams NZ and U.K in ratios from about 1:1 to 3:1.

Most of the U.S. companies that make carpet in the US import their yarns, dyed or un-dyed. Karastan (a division of Mohawk Industries) is the biggest exception, making their own on the worsted system. There are, however, other carpet wool-spinners in the United States, though they are far fewer than they were. Sylvania Systems buys wool from other countries, including NZ. This company, which only converted to wool-spinning a few years ago, has made a high reputation and sends yarns to several American tufters. J Wilde, in Philadelphia (est 1884) is the oldest spinning mill still going in this country. Geb Yarns, Fall River MA, and Jagger Brothers in Maine are two

venerable smaller operations that do (or contract out, in the case of Geb Yarns) some custom yarns for makers of American ingrain carpets like Thistle Hill or Family Heirloom. These last three spinners use blends of NZ and UK carpet wools, usually more of the NZ side. J. Wilde and Geb use scoured wool; Jagger Brothers imports top.

Most of the U.S. carpet manufacturers that sell woven ⁷ carpeting such as Wiltons actually import it, from England (like J.R. Burrows); from the continent, or from further east. Karastan I would guess is the largest carpet *weaving* operation in the U.S. at about 600,000 sq yards a year including Axminsters. Another productive weaver is Bloomsberg Carpets in Pennsylvania, which makes Axminsters and Wiltons, also tufted carpets. Their yarns come from NZ, the U.K. and Italy. The wool even in the latter two is likely to be in good part from New Zealand.

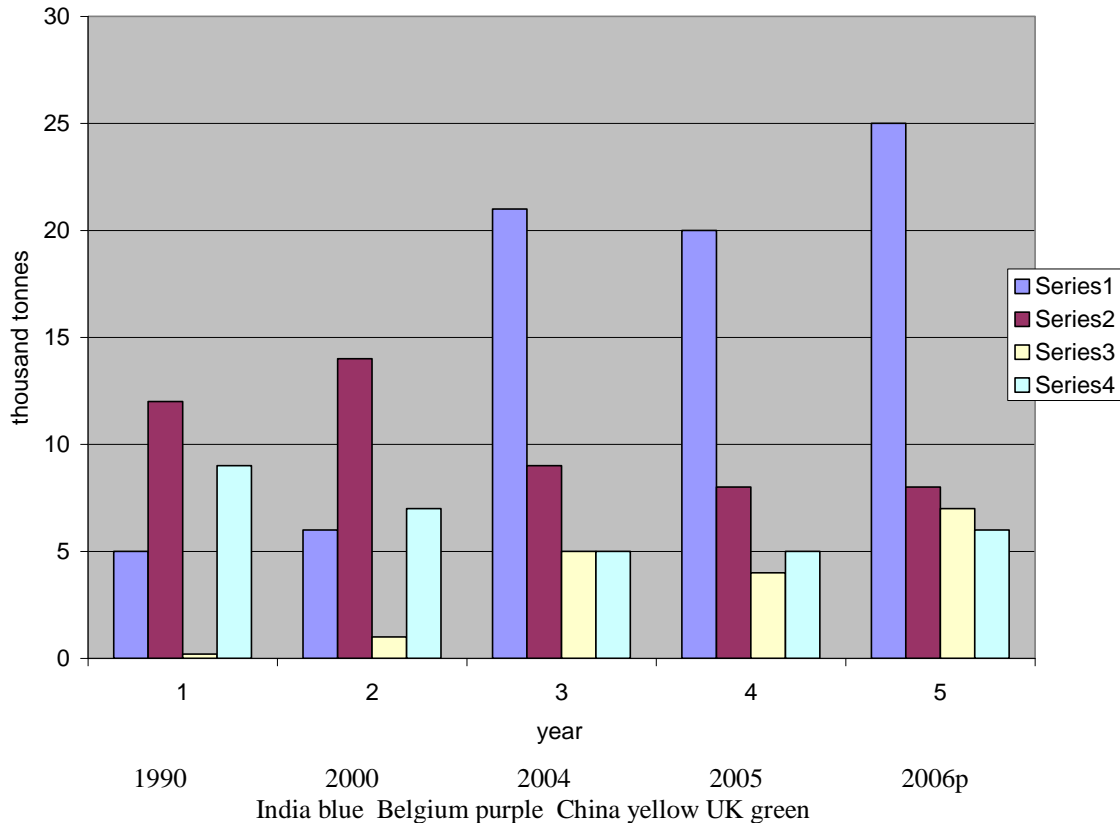
In summary, the wool yarns used by the world's best and oldest broadloom carpet manufacturers are nearly all at least 50% "wools of New Zealand" in which Romneys predominate. No other country and no other breed comes close to meeting worldwide demand for the raw material of these admirable and long-lived products.

Footnotes

1 wool-rich 80% or more wool, the balance most often nylon. For simplicity in this article I will refer to wool-rich and all-wool floor coverings as "wool-rich." The 80-20 wool-nylon blend is most prevalent in "wool-rich," the best ratio for looming, durability and wearability. This is typically used in cut-pile woven rugs like Axminsters. Loop-pile carpets are more apt to use 100% wool than the 80-20, as nylon can pill in this type of construction.

2 Both these countries import plenty of NZ carpet wool; far more, in fact, than the U.S. does. China as a country stands only behind "European Union" as the second-biggest importer of NZ wool. In 2006 China imported 33,000 tonnes clean basis, twice as much as the U.K. and three times more than Italy. India also imports a lot from NZ. www.woolnz-partner.com/industry/downloads/wool_wnz_1285.pdf

These imports are turned into international trade. In 2006 India ranked first in the world for export (that's export, not production) of **woven wool rugs and carpets**, shipping 25, 119 tonnes, while China in third exported 6,951. Belgium was second (7,668) and the U.K. fourth (6,078) tonnes (Source International Wool Textiles Organization Market information 2007 courtesy of Meat and Wool New Zealand Economic Service) The second graph below shows exports for the four leading exporters as of 2006 for selected years . I roughly reckon India's exports that year to be twenty million sq yards.



3 Broadloom uses a loom most often 12 feet wide, sometimes 13.5 or 15 feet. Some high-quality historic restoration carpets (ingrains for example) are loomed in narrower widths and sewn together

4 Clean basis = the clean yield expected after thorough scouring and drying to remove oils, vegetal matter, dirt This varies by breed and by conditions of raising from 50% (low) to 80% (high) of the raw or "grease" weight

5 American chosen for two reasons. I wanted to tell Americans something I had not known until starting the project: a good bit of the best wool-rich broadloom in the world is made in this country, another good bit comes here for sale; second, I knew American companies would be more ready to help with advice and materials. A third good reason emerged, unexpected at first: the fascinating history of carpet-making in America, but that's a tangent I'm trying to resist. Good overview at <http://eh.net/encyclopedia/article/patton.carpet>

6 dollar value of carpet yarns 93.4 M\$NZ 2005-2006 over total wool sector of 998M\$NZ source www.meatandwoolnz.com/main.cfm?id=259

7 Over 90% of rug and carpet made in the U.S. is now *tufted*, as opposed to 2% *woven*. Of all the output, less than 1% is wool-rich, our subject here. Woven rugs and carpets are more apt to be wool-rich than are tufted, but can be made with synthetics. In 1950 almost everything was woven and of wool, but the total production of rugs and carpets (~ 60 million sq yards) was only about 3% of today's (2 billion) square yards. The exponential growth of the rug and carpet industry America shows in the bar graph below, inexpertly made so that the time intervals on the x axis are not at all uniform. The data for it, taken from several sources, are in the table above it.

US rug and carpet production by year, millions of square yards

1834	1
1850	8
1870	20
1923	83
1948	90
1951	73 (67 (92%) woven)
1955*	138
1960	166 (52 (31%) woven)
1968	435 (40 (9 %) woven)
1973*	1,000
1995**	1,600
2002	4% woven
2005	2,057

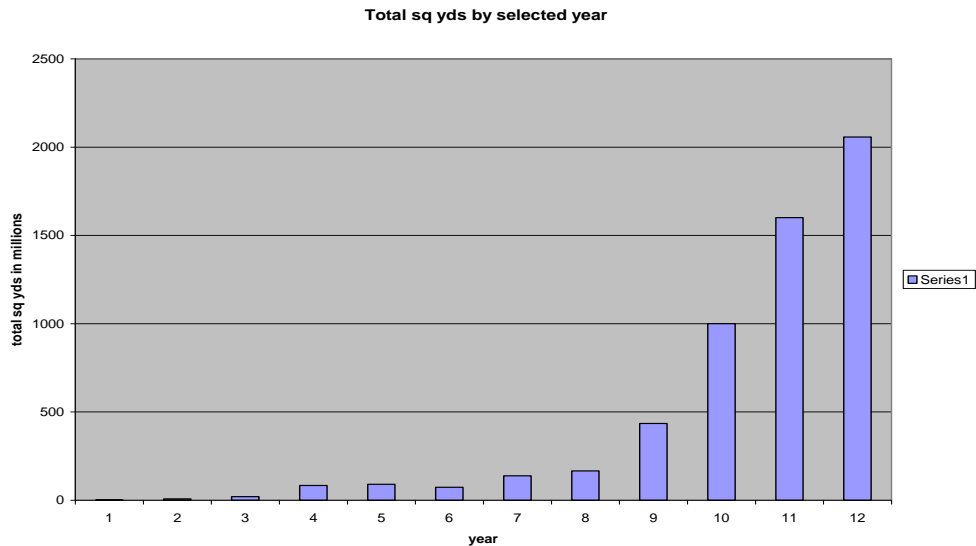
Source for years without asterisk Patton, Randall A History of the U.S. Carpet Industry

<http://eh.net/encyclopedia/article/patton.carpet>

source for 2005 <http://www.carpet-rug.org/carpet-and-rug-industry/carpet-and-rug-industry-statistics.cfm>carpet-rug industry statistics

source for 1955 and 1973 (both with asterisk) History of Mohawk Industries, International Directory of Company Histories vol 63 St James Press 2004

source for 1995** Carpets and rugs industry snapshot from Encyclopedia of American Industries Gale 2008



1 =1834, 2 =1850, 3 =1870, 4 =1923, 5 =1948, 6=1951, 7= 1955, 8=1960,
9 = 1968, 10 =1973, 11= 1995, 12 =2005

Strong-wool growers should be very grateful to the tufting process, which readily uses wool for high-quality carpeting made at much lower cost than by weaving. If it weren't for the invention of tufting machines and their application to carpeting, machine-made wool rugs and carpets might have died as an

industry, priced out of common reach. For a good history of tufting, look at www.carpet-rug.com. For diagrams of weaving types try www.bloomsburcarpet.com or www.brintons.net/

In mechanized carpet-making, woven constructions like Axminsters, Wiltons and ingrains are unsurpassable artistically (color varieties, pattern clarity). Woven types will also endure longer, make better heirlooms. Still, high-quality machine tufting can deliver an affordable, beautiful wool-rich rug. This has to be a huge factor in the survival of the large-scale wool carpeting industry since the introduction of nylon in 1947. Without a need for scores of thousands of tons of high-quality strong wools worldwide for tufted floor coverings (tufting has 70% share in Europe now), the NZ Romney would have to compete solely as a meat lamb. It could do so, I don't doubt, but without a dual-purpose would find the economic competition much tougher and might over time lose its supremacy in the country

Timeline for European and North American woven carpets

1608 French production of Turkish-style carpets (knotted pile) begins under Pierre Dupont in the reign of Henri IV. moved to Savonnerie 1627

1735 Ingrain carpet (a no-pile weave later known as Kidderminster, Scotch, Kilmarnock, two-ply, three-ply) is being woven in Kidderminster, Worcs. Ingrain in the next century dominated the rug and carpet industry in America, but not in England

1743 Aubusson factory in France starts making knotted pile in addition to flat tapestry carpets

1750-55 Peter Parisot (b. France) opens knotted pile manufactory in London, moves to Fulham thence to Exeter

1752 Thomas Moore adds carpet-weaving to his cloth factory in Moorfields, near London

1755 Thomas Whitty(1713-92) sets up in Axminster, Devon after allegedly spying on Parisot. His hand-knotted, French style carpets used a supplementary weft packed with two sinuous wefts. His business stayed in the family for three generations, was closed by fire in 1828. Whitty's company made a carpet 72 x 54 for the Sultan of Turkey

1783 Brintons founded, Kidderminster

1790 Woodward Grosvenor founded, also in Kidder

1791 First carpet mill in U.S. Philadelphia by Wm Peter Sprague, who had worked for Thos Whitty

1801 Jacquard (in Lyon) patents improved system for organizing warps in silk weaving Applied to carpet weaving in France and England mid-1820s

1832 Whytock's drum for printing segments of warp thread with different colors makes possible "tapestry Brussels" with less warp yarn buried.

1839 James Templeton, Glasgow starts to make mechanized "Chenille Axminster" AKA "Patent Axminster" His carpets, with chenille tufts as supplementary wefts, are not structurally the same as hand-knotted Axminsters, but in the word of Sarah B. Sherrill "emulate" the latter. Templeton did not use power looms for this process until the 1870s.

1839 Erastus Bigelow's power loom, Lowell MA, opens the door to faster production of high quality ingrains. Curiously, it took 30 years more to realize the potential of power looms in U.S.

1845 Alexander Smith and Sons opens in West Farms NY. Their colleague Halcyon Skinner developed two new types of Axminster looms -- spool and grip. Like patent Axminster these were mechanized imitation of hand-knotted Axminsters. By 1929 Alexander Smith had become the world's largest maker of carpets and rugs.

1878 Shuttleworth Bros brought 14 used Wilton looms from England to Amsterdam NY

Their descendants started Karnak Wilton in 1905 and in 1920 after other mergers formed Mohawk Carpet Mills

1928 Marshall Field's first Karastan (this one like an Axminster);in debut at World's Fair, a Karastan was trodden-on by 5 million people and cleaned up good as new

1938 Dupont introduces nylon

1947 first nylon carpet

1949 tufted carpeting machines by Bigelow-Sanford in Dalton GA

1956 Mohawk Carpet Mills, Inc merges with Alexander Smith to form world's largest carpet company, Mohasco

1980 Mohawk starts move to GA

Today Three of the four largest carpet-makers in the world are within a 60-mile radius of Dalton GA, near what used to be "bedspread alley."

People who have helped on this quest, some a lot: Jim Adams, Bloomsburg Carpets Bloomsburg PA; Andy Bahl, Carpet Garage Kingston NY; Howard Bates, Becket Barn Farm Brookland, Kent U.K.; Ben Boyer, Sylvania Yarn Systems Sylvania GA; John Burrows, J R. Burrows Rockland MA; Rick Clanton, Ingrain Carpets Lancaster PA; Jim Cody, Bloomsburg Carpets Philadelphia PA and New York NY; Tom Condon, Beauvais Carpets New York NY; Wes Connelly, Wools of New Zealand Marble Hill GA; Neal Cooper, Unique Carpets Riverside CA; John Dearnley, S&D Spinning, Millbury MA; particular thanks for extra help to Elise Demboski, GA, consultant to WONZ and to Karastan; Christopher Dessler, Bellbridge Carpets NY; Alistair Flett, Summit Wools Ouamaru NZ; Kimberly Gavin, Floor Covering Weekly Uniondale NY; Rabbit Goody, Thistle Hill Weavers Cherry Valley NY; Scott Gray, Jagger Brothers ME; Terry Green, Woolshire Carpets Calhoun GA; Stewart Hay, Glen Eden Carpets Calhoun GA; Matt Holcombe, Mohawk Industries Greenville NC; David Kline and Patrick Kline, Family Heirloom Weavers Red Lion PA; Frank Langrish, British Wool Marketing Board, Bradford West Yorkshire UK; Pat Lavin, J Wilde and Brother Phila. PA; Gordon Levet, Kikitangeo Wellsford NZ; Phil Lindsay, R.H. Lindsay Boston MA; Sayre Litchman, Geb Yarns Fall River MA; Tim Lonsdale, Wools of New Zealand NZ; Carol Swedlow, Aronson's New York NY; Angelo Zuffante, Bloomsburg Carpets NY NY

Photo credits: Romney Statue, K Moore Banklea 639-03 R Brown

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Appendix tables

2005 sheep census by country in millions		2005 production of raw wool clean basis metric tons	
China	147	Australia	326,193
Australia	102.6	New Zealand	174,900
India	57.9	China	167,759
Former Soviet Union	54.6	Former Sov Union	79,575
Iran	53	India	38,080
Sudan	42.8	Uruguay	29,396
NZ	40	U.K.	28,000
South Africa	25	South Africa	28,000
Turkey	25	Turkey	27,000
Pakistan	24.7	Argentina	25,300
All other	572.6	All other	384,569
World total	1,001	World	1,200,581

Source British Wool Board <http://www.britishwool.org.uk/pdf/Factsheet4.pdf>

Can one use the ratio of production to number of sheep to reckon the average wool production of each sheep by country? This is full of dangers, but yields interesting numbers. It would appear that NZ, with an average clip of 4.38 kg and Australia with 3.2 kg are the only countries that do far better than the world average of 1.2 kg. The U.K. figure ($28/23 = 1.2$) is so low I suspect a mistake.