New Chemical Finishes
Strengthen Cotton In
Today's Textile Race

By Pauline Hall

During the last 20 years, much research and development has been done with chemical finishes on cotton to improve the consumer acceptability of the fiber. In recent years, the man-made fibers have forced cotton to assume a greater competitive role, by stimulating the desire for textiles with "engineered" or "built-in" properties and characteristics.

The earlier chemical finishes on cotton were mainly the so-called "wash-and-wear", or wrinkle-resistant types of finishes. These products were quickly tried by the consumer, who found many of the advertised claims to be highly misleading.

Some of the earlier consumer experiences included finishes which did not appear to maintain the functional properties for the normal lifetime of the garment. Low breaking and tearing strengths of the fabric were reflected in poor sewability, and the formation of unpleasant odors.

Some Recent Developments

Since the early history of wash-and-wear finishes, many other types of functional finishes appeared on the market, such as water repellent and stain repellent finishes. Any one chemical finish often possesses a number of different characteristics. One example of this is a silicone which was originally developed as a water repellent finish and later promoted as a stain repellent. More recently, the silicones are used as crush resistant finishes on pile fabrics, such as velveteen.

Other developments of finishes on cotton include flame resistant, stretch by slack mercerization (reported in the March-April, 1964 issue of PROGRESSIVE AGRICULTURE), and anti-bacterial finishes. All of these finishes may have certain limitations, depending on the end-use and care given by the consumer. As an example, the anti-bacterial finish will initially provide suitable protection from the formation of odor-producing bacteria. After use, this finish may lose its effectiveness by leaching, either in laundering or by body perspiration.

Some of the latest research and developments on cotton are pretreating the fiber before the addition of a cross-linking (wrinkle resistant) agent, using blends of finishing agents to impart desirable "hand" properties, and the so-called "permanent press" for permanent pleats and creases and wrinkle-free garments. Generally, this involves an application of a chemical finish on fabric which is not cured or permanently set until after the garment is made. Some trade names are Koratron, Coneprest, and Dan-press; however, many others are found today.

Permanent Press Garments

The permanent press process possesses the advantage of producing pucker-free seams in garments if they are properly constructed. Some disadvantages were noted in some of these items, such as the fact that the thread used to sew the seams fell apart after little use. Most of the industry has resolved this by using heavier cotton thread, or thread blended with cotton and polyester or nylon.

Very low tear strength of some of the earlier all cotton permanent press garments was accompanied by very low abrasion resistance. The result was that garments fell apart. Research is now seeking to remedy the former failures in all cotton permanent press items.

Better blends of chemicals, with greater knowledge of the proper curing temperatures and times, has resulted in improved performances. Differential cross-linking, in which the two sides of a cotton fabric are treated separately and sometimes with different finishes, upgraded abrasion resistance. Micro-stretching with mercerization, followed by the chemical application for permanent press, produced better characteristics.

Grafting of chemicals onto cotton by means of irradiation (or X-ray treatments) is currently receiving much attention. With such research and development studies, the future of all cotton permanent press hopefully will renew competition in the textile industry, which now is stressing the blends of fibers.

THANKS TO RESEARCH ACTIVITY

Agriculture, mankind's basic industry which traditionally has supplied the primary needs of food and clothing, will receive a hearing at the Tenth Arizona Town Hall April 9-12.

Several University of Arizona economists and hydrologists have contributed to a research report of background data which Town Hall panelists are now studying. Contributing to a report of over 200 pages, including 35 tables and more than 20 figures are C. Curtis Cable, George W. Campbell, Roger W. Fox, Philip G. Hudson, William E. Martin, Sol Resnick and Thomas M. Stubblefield.

Dr. Stubblefield was project leader.

The six chapters in the report discuss the historical background of U. S. agriculture, importance of agriculture to Arizona's economy, federal agricultural programs, changing patterns of Arizona agriculture, dependence of Arizona agriculture on water, and problems now facing Arizona farmers.