CHEMICAL AND STRENGTH DIFFERENCES IN DEW-RETTED HEMP FIBER

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PRODUCTION of good quality hemp fiber depends largely on the retting process. While dew retting is a comparatively simple operation for freeing the fiber, control of the large number of factors which enter into retting is very difficult. Well-retted fiber should have good strength and a uniform slate-gray color. Under-retted fiber is green or light-colored and does not have the keeping and spinning qualities of well-retted hemp fiber. Over retting usually gives the proper color but may produce weak fiber. Some measure of control may be had by shocking hemp before spreading. This procedure seems to condition the hemp against over retting by slowing down microbiological action. Turning the hemp in the field gives more uniform retting, while picking up the straw to stop retting at the proper time is important.

In order to understand more about the retting process, studies were conducted at the Kentucky Agricultural Experiment Station on the chemical composition of the green, unretted fiber, and of fiber produced at various stages of retting, including fall and winter retting, from both Kentucky and Chilean varieties. The actual strength of these fibers was determined by breaking-strength tests in order to find out the effect of retting on strength and to correlate strength, if possible, with chemical composition.

METHODS

For analysis the hemp fiber was sampled at random and ground to 60-mesh in the intermediate Wiley mill.

Cellulose was extracted by the method of Norman and Jenkins (1). Medium-porosity fritted glass crucibles were used to facilitate manipulation in removing extraneous material from cellulose. Two treatments with neutral sodium hypoclorite solution and three with acid hypochlorite solution were found sufficient to give reasonably pure cellulose. After washing the sample several times with 5% sulfuric acid solution and four or five times with boiling water, the crucible was put into a 250-ml wide-mouth Erlenmeyer flask, where oxidation with a sulfuric acid dichromate solution was carried out and the analysis made according to the method of Kettering (2). Because of the associated xylan present in hemp cellulose, a slightly higher factor was necessary. One milliliter of normal potassium dichromate was equivalent to 0.0068 gram of cellulose.

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