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**MANAGING COTTON USING
HVI DATA AND THE EFS[®] SYSTEM**

by

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Over the past decade, the U.S. textile industry has embraced the use of laboratory instrument data to purchase, warehouse, and utilize cotton. These data include the following ten attributes:

TABLE 1

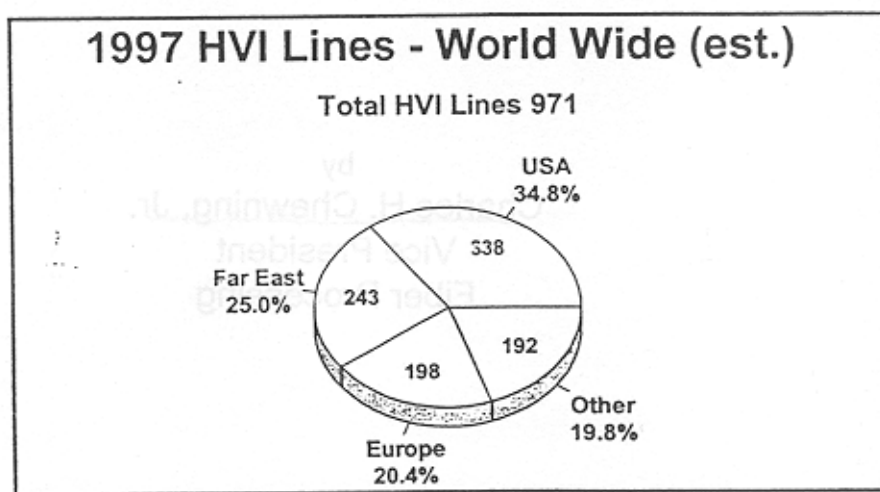
1. Micronaire	6. Trash
2. Length	7. Short Fiber %
3. Length Uniformity	8. Color Grade
4. Strength	9. Reflectance(Rd)
5. Elongation	10. Yellowness(+b)

While other cotton attributes can be measured, those listed in Table 1 can be rapidly measured using “High Volume Instrument lines.” High Volume Instrument lines (HVI)

are manufactured by Zellweger User in the United States.

HVI lines are in use throughout the world, and recent data indicates that almost 1,000 are in operation. Figure 1 shows that of 971 total HVI lines, 35% are located in the United States, 25% are in the Far East, and 20% are in Europe.

FIGURE 1



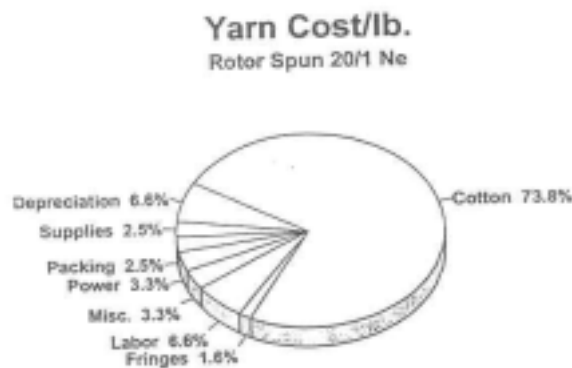
It should be noted other laboratory cotton testing instruments are commonly used to provide supplemental information of cotton quality. Two examples of such instruments are Zellweger's "AFIS" and Shirley Development's "MicroMat". In the United States, HVI data is now in use by the three major cotton production/ consumption segments. These segments are:

- Cotton Producers/ Gins
- Merchants/Co-ops
- Mills

Mills began to use HVI data in the early 1980's when it became necessary to drastically reduce labor costs and produce fabrics which met stringent quality

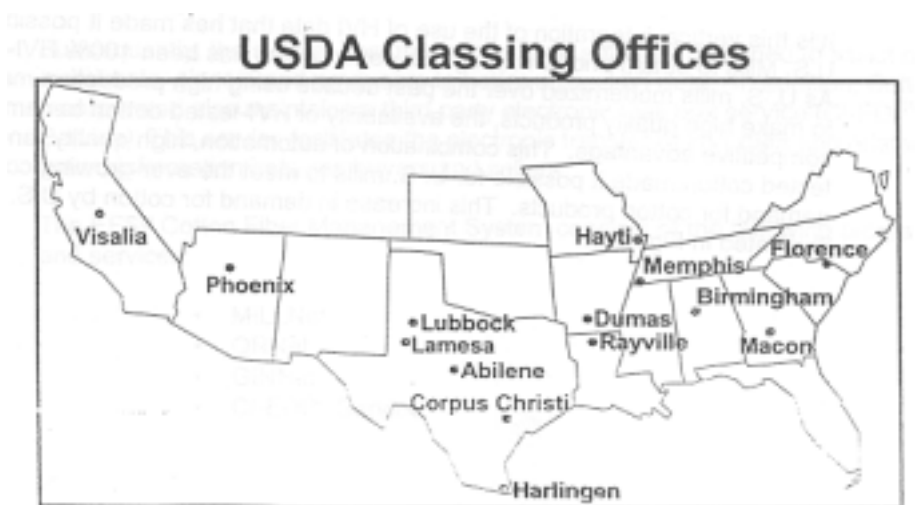
specifications. Figure 2 illustrates that the cost of cotton is now the single biggest cost in the spinning of yarn.

FIGURE 2



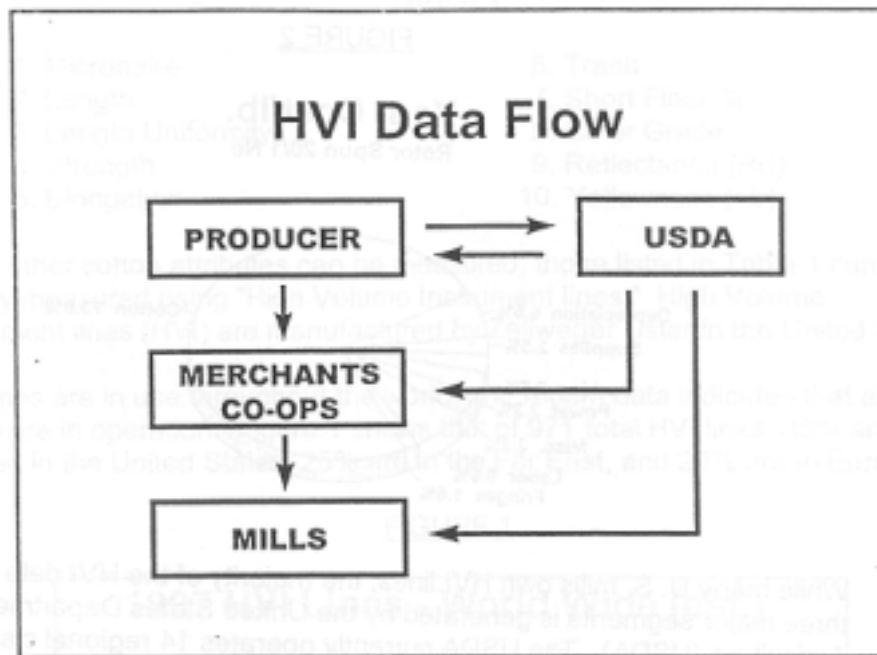
While many U.S. mills own HVI lines, the majority of the HVI data used by the three major segments is generated by the United States Department of Agriculture (USDA). The USDA currently operates 14 regional classing offices shown in Figure 3. These offices are operated during the harvest season, and supply HVI data to each producer for a fee.

FIGURE 3



The flow of HVI data among the U.S. Cotton Industry segments is illustrated in Figure 4.

FIGURE 4

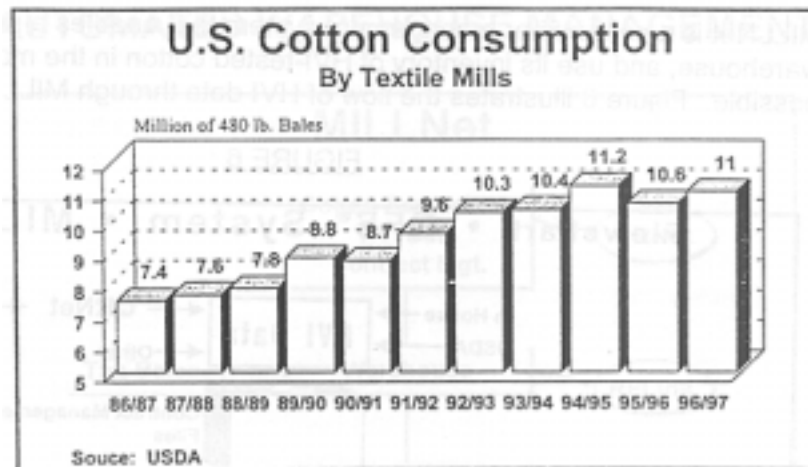


HVI data is used by each of the three major segments to improve its competitive position. This usage includes passing HVI data on to customers as a value-added service.

It is this vertical integration of the use of HVI data that has made it possible for U.S. Mills to obtain and effectively use cotton which has been 100% HVI-tested. As U.S. mills modernized over the past decade using high production machinery to make high quality products, the availability of HVI-tested cotton became a competitive advantage. This combination of automation, high quality, and HVI-tested cotton made it possible for U.S. mills to meet the ever-growing consumer demand for cotton products. This

increase in demand for cotton by U.S. mills is illustrated in Figure 5.

FIGURE 5



It is my observation that most mills outside of the United States do not yet appreciate the competitive advantage that can be gained by processing 100% HVI-tested cotton. In fact, it is not unusual to see foreign mills doing 10% testing with an HVI line. Many of these lines are operated in conditions which are anything but "standard". This suggests that foreign mills can improve their production cost by purchasing USDA HVI-tested U.S. cotton.

Cotton Incorporated recognized the value of HVI data to the industry in the mid-1970's. During this period, computer software was developed to manage HVI data for mills. This software has become known as Engineered Fiber Selection, of the EFS[®] System. After a period of extensive evaluation, the EFS[®] System was made available in 1982 to U.S. mills.

Subsequently, the system has grown to include software designed to assist mills, merchants, ginner and producers to better utilize HVI data. In addition, Cotton

Incorporated also maintains a third party electronic mail box service (CI-EDISM Service). This service facilitates the electronic transfer of HVI data and related cotton information between buyers and sellers.

The EFS[®] Cotton Fiber Management System consists of the following programs and services:

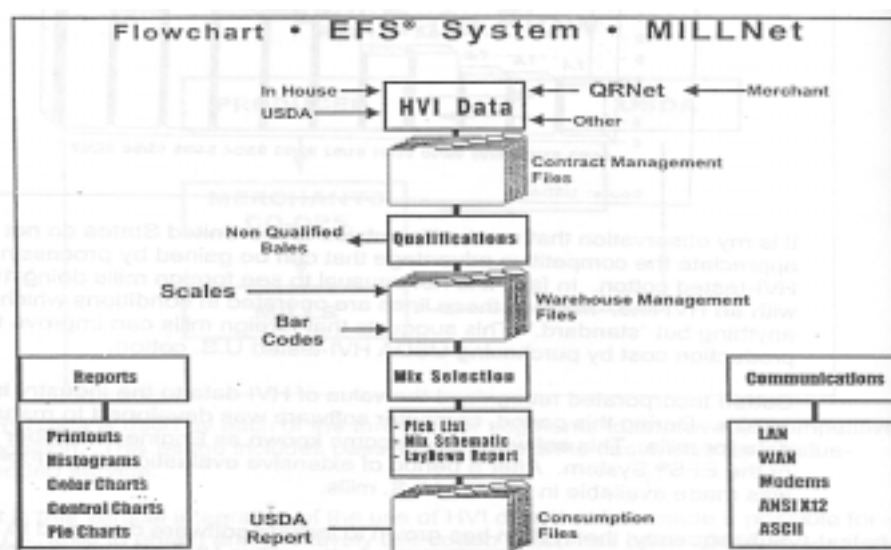
- MILLNet
- QRNet
- GINNet
- CI-EDISM Service

MILLNet

MILLNet is a cotton fiber management system that enables a mill to acquire warehouse, and use its inventory of HVI tested cotton in the most effective way possible.

Figure 6 illustrates the flow of HVI data through MILLNet.

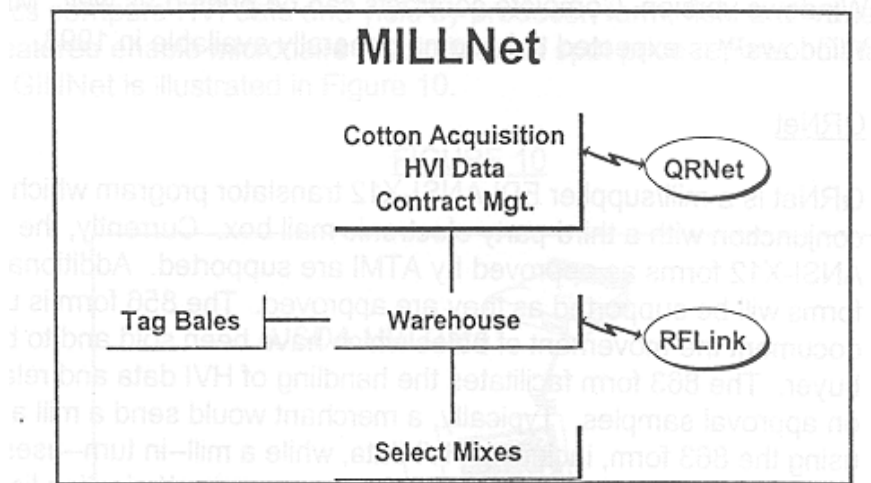
FIGURE 6



In addition to selection uniform, even-running mixes using several HVI properties, MILLNet offers full warehouse management capabilities and supports bar coded bale tags. Figure 7 illustrates automated warehouse management using RF-linked bar code terminals.

FIGURE 7

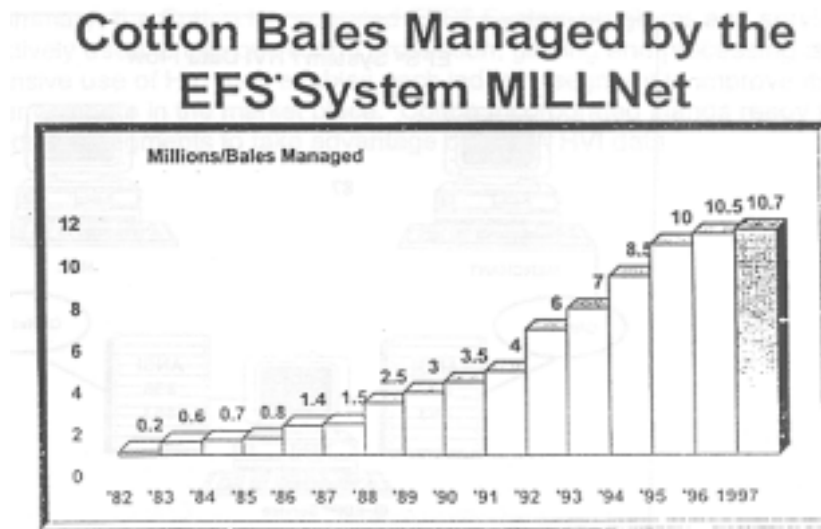
AUTOMATED WAREHOUSE MANAGEMENT



MILLNet supports storage and retrieval of bales by either category codes, by actual bale numbers, or both. Mix selection procedures supported by MILLNet emphasize the selection of mixes which have consistent HVI property averages and distributions (%CV), both within and between mixes.

In 1997, the EFS[®] System MILLNet program is expected to manage in excess of 10.7 million bales of cotton (see Figure 8) representing a market value in excess of \$3,500,000,000.

FIGURE 8



MILLNet is designed to run on IBM PC type computers operating under the DOS environment. A version of MILLNet operating under Microsoft Windows 95™ is now in beta-testing. This version features advanced cotton contract management capabilities. Both fixed and on-call contracts are supported in the Windows version. Complete contracts can be printed as well. MILLNet for Windows is expected to become generally available in 1998.

QRNet

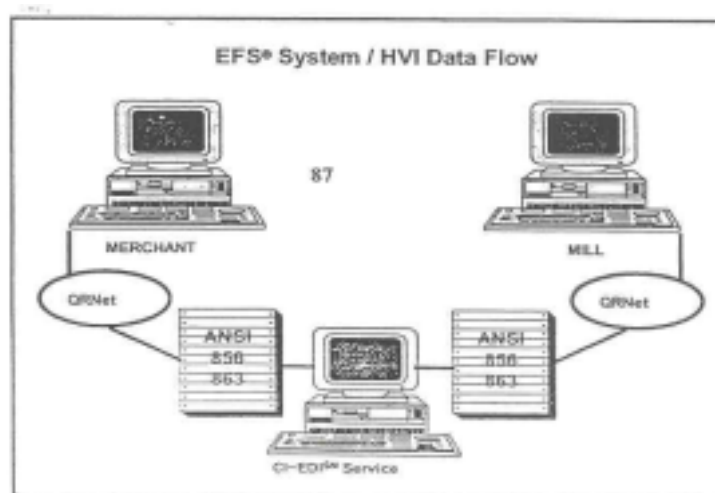
QRNet is a mill/supplier EDI ANSI-X12 translator program which is used in conjunction with a third-party electronic mail box. Currently, the 856 and 863 ANSI-X12 forms as approved by ATMI are supported. Additional cotton-related forms will be supported as they are approved. The 856 form is used to document the movement of bales which have been sold and to be shipped to a on approval samples. Typically, a merchant would send a mill a sample tag list using the 863 form. including HVI data,

while a mill-in turn-uses the 863 form to electronically provide the merchant with an approval/rejection list. The flow of these two forms illustrated in Figure 9.

CI-EDISM Service

CI-EDISM Service is a central electronic mail box designed to receive and/of transmit ANSI-X12 856 and 863 documents between cotton suppliers and mills. The 856 and 863 documents contain HVI data and related cotton transaction information. CI-EDISM Service is offered on a monthly subscription basis (see Figure 9).

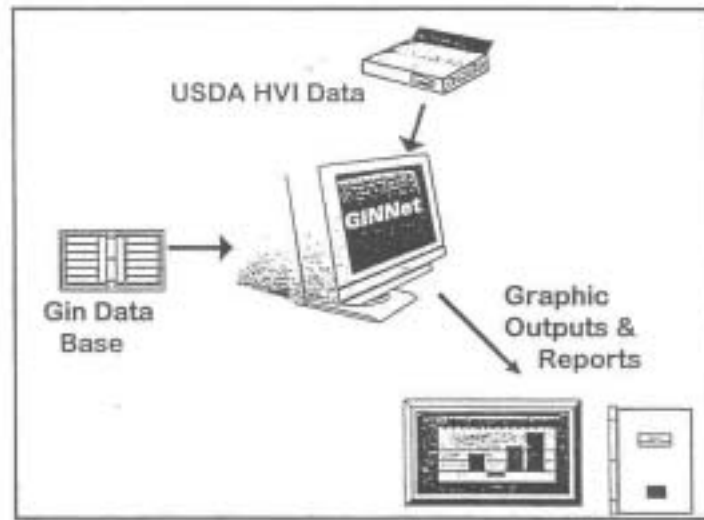
FIGURE 9



GINNet

GINNet is an HVI data analysis software program designed to assist ginners/cotton producers improve cotton quality and yield. Extensive reports and graphics compare HVI data and yield by producer, farm, field and variety. Two new features enable micronaire prediction and spot price reports. Data flow within GINNet is illustrated in Figure 10.

FIGURE 10



In summary, the Cotton Incorporated EFS[®] System programs and service can be effectively used to improve cotton production, ginning and processing at mills. Extensive use of HVI data enables each industry segment to improve its ability to better compete in the market place. Cotton Incorporated stands ready to assist all industry segments to take advantage of USDA HVI data.