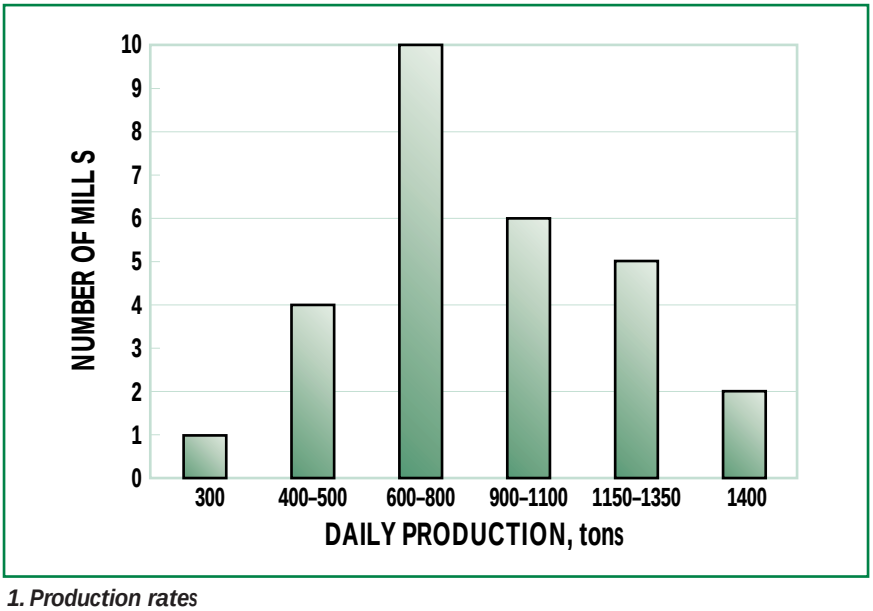
A SURVEY OF PULP MILL USE OF ANTHRAQUINONE

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A 1994 SURVEY BY THE PULPING PROCESS SUBCOMMITTEE SHOWED SIGNIFICANT INTEREST IN ANTHRAQUINONE USE BUT LITTLE FULL-SCALE EXPERIENCE. RECENT CONFERENCES HAVE HAD MANY PRESENTATIONS ON USING THE MATERIAL PROMPTING, A FOLLOW-UP SURVEY.

ANTHRAQUINONE (AQ) IMPROVES THE DELIGNIFICATION selectivity of kraft pulping. Although Japanese mills use AQ extensively, few North American mills were pulping with AQ until the 1990s. Increasing wood costs, the need to delignify to lower kappa numbers for more environmentally friendly bleaching, and minimization of recovery furnace bottlenecks have prompted many mills to reexamine AQ. In 1994, the Pulping Process Subcommittee of the Alkaline Pulping Committee decided to gauge the use of AQ in U.S. pulp mills. This article summarizes the results of a survey completed during the summer of 1994 sent to U.S. kraft mills on use of AQ as a pulping catalyst. The survey achieved a 37% response rate—45 of 121 responses. One mill reported data for two pulping lines for a total of 46 installations.



1. Production rates

The mills comprised the following categories:

- Batch lines: 25
- Kamyr continuous lines:13
- Continuous digester line: 1
- No indication: 7.

Respondents totaling 23 produce softwood pulp, 6 produce hardwood, and 11 use both hardwood and softwood in their wood supply. Ten installations are unbleached pulp lines, and 30 installations produce bleached pulp. Market pulp producers totaled 7 respondents, integrated mills totaled 21, and market and integrated mill suppliers totaled 7. Respondents practicing no form of extended cooking were 33 with 3 modified continuous cooking (MCC) operations and one extended modified continuous cooking operation. The median production rate for all respondents was 762.5 unbleached tons/day. Figure 1 shows that production rates for all lines ranged from 300 to more than 1900 unbleached tons per day.

Mills reporting that they use AQ routinely in their operations were 11, and 24 reported full-scale trial work at their mills. Common reasons for using AQ were to

improve yields, lower production of black liquor solids, and reduce kappa number to the bleach plant. Four mills could not document any improvement in the yield, but 8 mills indicated a measurable increase in the yield due to the addition of AQ. Seven mills had success in reducing their black liquor solids production. Five mills reduced the lignin content of the pulp to the bleach plant. One respondent suggested that "AQ may help when a mill does not have adequate or up-to-date screening and inventory management."

The survey asked respondents to identify what form of AQ they used. Six mills used a dispersed form of AQ, 14 used soluble AQ, and one used the dry form. All mills that reported dosages for AQ used less than 0.1% AQ on wood.

Solubility issues were the main problems that mills reported when using AQ. The AQ formed deposits in the evaporators and heat exchangers. Handling the metering pumps was also difficult. One respondent said that using flush water in the metering pump "significantly increases the efficiency of the AQ in our mill."

The 1994 survey revealed significant interest in AQ use but little full-scale experience. Recent conferences on pulping have had many presentations on the use of AQ. The Pulping Process Committee therefore felt another survey was necessary to monitor the changing applicability of AQ chemistry. The results of the new survey will be presented at the "Breaking the pulp yield barrier" Symposium, held in conjunction with the TAPPI Annual Meeting, Feb. 16–18, 1998, in Atlanta, GA. TJ

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