

A case to undertake study on outside chip storage in India

Y.K. SHARMA

Introduction

To-day, in many parts of the world e.g. America, Canada, Australia, Scandanavian countries, Japan etc., outside chip storage (O.C.S.) is being practised as standard method of storage of raw material. It is particularly economical in mills where large inventory of pulp wood is a necessity. Outside chip storage differs from outside storage of wood as heating occurs in the chip pile. The rise in temperature results in chemical changes. The temperature range in a large chip pile is so wide that thermophillic organisms as well as wood degrading and wood staining organisms can find satisfactory growth conditions in various parts of the pile.

The degree of degradation, discoloration and contamination of chips depend upon wood species, type, condition and size of storage and climatic conditions. Surface on which pile is made is normally made by grading and sampling the soil. A layer of sand, cinders, gravel or a layer of chips upto 12" thick laid down over a well draining soil could be used.

Advantages of O.C.S.

Literature reports several advantages of O.C.S. over round wood storage. The biggest advantages is, however, considerable reduction in raw material handling cost and reduction of space required for storage.

Reduction of space is mainly due to the height of chip piles being large. Besides these industry could get uniform chips by chipping wood when it is moist. Since moist wood could be chipped more easily the chipper capacity could also be increased. In chip screening considerable amount of dust is removed particularly when dry wood is chipped. The amount of dust when wet wood is chipped will be less thus not only saving raw material but also avoiding problem of disposal of dust.

Particularly in hardwoods extractives give some trouble in recovery. This trouble could perhaps be reduced by O.C.S. as extractives will oxidise.

Disadvantages of O.C.S.

There are few disadvantages also in outside chip storage. The quality of pulp could be adversely effected in case degradation in the pile is too much. We anticipate more degradation in India due to climatic conditions. Wood losses can also be more. In addition fines can be carried away by wind and create nuisance.

Proposed Plan of Work

It is intended to conduct an experiment in collaboration with the Star Paper Mills Ltd., Saharanpur to study the effect of outside chip storage vis-a-vis log storage on pulping and paper making qualities. *Eucalyptus hybrid* will be used in the experiment. A pile will be made which will hold about 100 tonnes

of dry chips. About 10 tonnes of debarked Eucalyptus will be stacked and stored for the same time as chips for comparing chips storage with log storage. The logs will be kept near the pile. Wood losses, chemical composition, pulping and paper-making qualities and degradation will be determined to ascertain which will be a better mode of storage in tropical climate. The plan of work is as follows :—

1. **Outside chip storage :—**The space required for this experiment will be 30 m.×15 m. The site preparation will be done as follows :—

On the ground 9"—10" layer of gravel will be put and with the help of roller it will be aevened out. Over this a pile of chips will be made.

2. **Preparation of chips and chip pile :—**The chips will be made at the Star Paper Mills using green Eucalyptus. The pile will be compacted. Samples of five kilogram chips will be kept in plastic netting and these bags will be inserted in the pile at places from where samples will be drawn. Every bag will be given a code number to know the exact location of it in the pile during removal. Continuous recording of temperature will be done at places where sample for analysis are kept. Data of climatic conditions will also be collected.

3. **Testing :—**Portions of the pile will be broken after 3 months, 6 months, 9 months and 12 months and plastic bags will be removed and

Y.K. Sharma, Cellulose & Paper
Branch F.R.I. Dehradun.

brought to the Forest Research Institute for evaluation. The following data will be collected :—

(a) *Wood less.*

(b) *Proximate chemical analysis of chips.*

(c) *Pulping* :—This will be done using sulphate process. Four conditions of pulping will be done. This will enable us to interpolate the results at one Kappa number.

(d) *Pulp evaluation* :—This will be done at four different free-

nesses to interpolate the results at same freeness and same bulk.

4. Microbiological investigations:—

These will be done by Forest Pathology Branch, Forest Research Institute.

5. *Insect attack* :—In case insect attack is observed, this will be done by Forest Entomology Branch, Forest Research Institute.

6. The following figures will be taken from the Star Paper Mills:—

(a) Power consumption of green and dry logs.

(b) Chip classification of green chipped wood and dry chipped wood.

(c) Cost data of log storage and out-side chip storage.

7. *Log storage* :—A stack of *Eucalyptus hybrid* will be made. Precautions will be taken to avoid direct contact of log with ground soil. A portion of the log will be cut by power saw after every 3 months (same as O.C.S. sampling). The data similar to that of O.C.S. will be collected and compared.