

Alternative Means of Expanding Tobacco

Two meetings were held to discuss alternative means of tobacco expansion. Those present for the first meeting on March 21 were: Messrs. E. C. Cogbill, P. R. Collier, E. Glock, C. H. Hibbitts, R. M. Irby, Jr., P. H. Leake, V. B. Lougee, III, P. M. Pedersen, T. P. Pettigrew, B. F. Price, F. L. Rickett, R. S. Sprinkle, III, H. E. Wright and J. E. York, Jr. Those present for the second meeting held on March 31 were Messrs. J. T. Ashworth, L. J. Dewey, E. Glock, R. M. Irby, Jr., P. H. Leake, F. L. Rickett, W. W. Sadler, R. S. Sprinkle, III, H. E. Wright and J. E. York, Jr. The ideas presented during each of these meetings have been collected and are shown below according to suggested method.

I. Methods Involving the Use of Carbon Dioxide (CO₂) or Gases Soluble in or Reactive With Water or Tobacco

a) (PMP) Use CO₂ as gas or solid, pretreat the tobacco with materials to increase the absorption of CO₂ (e.g., NaHCO₃, NaCO₃ and Coca Cola syrup, etc.) then heat tobacco in Jetstream, U-shaped or other suitable dryer.

b) (EG) Following treatment of tobacco with CO₂, heat tobacco using microwave energy.

c) (ECC) Use tobaccos which naturally have higher total volatile base content; also, use fermented tobaccos and then treat these tobaccos with CO₂ followed by suitable means for expanding tobaccos.

d) (ECC) Extract bases from waste tobacco, add these to tobacco to be expanded then treat the tobacco with CO₂ under suitable conditions and expand using suitable means.

e) (CHH) First make tobacco alkaline to increase CO₂ uptake, then acidify and treat with microwave energy to cause expansion.

f) (CHH) To get water into tobacco cells, subject tobacco to steam at elevated pressure, then add CO₂ under pressure and heat in dryer to cause expansion.

g) (FLR) As an alternative to subjecting tobacco to steam at elevated pressure, add water at atmospheric pressure to tobacco and allow to stand until permeation is complete.

h) (BFP) Add salt to water to aid permeation.

i) (CHH) Make salt alkaline (i.e., salt of weak acidity plus strong base)

j) (JEY) Make salt a burn promoter.

k) (RMI) Do a literature survey to determine means by which CO₂ uptake may be increased.

l) (WWS) Pressurize Bauer digester used in the preparation of BRS with CO₂ to increase the degree of expansion resulting from this process.

m) (ECC) Treat tobacco with water and remove water by distillation with solvent that forms a water azeotrope.

II. Methods Involving the Use of Water and Heat

a) (W.H. Bass as reported by R. M. Irby) Find appropriate dryer which will cause rapid heat transfer and use this to treat tobacco having high moisture content.

b) (ECC and BFP) Raise moisture content of tobacco stems or lamina and heat in vacuum desiccator.

c) (ECC) Make cigarettes at high moisture then put in vacuum oven at elevated temperature.

d) (EG) Make cigarettes at high moisture and treat with microwave energy.

e) (RMI) Treat tobacco having a high moisture content with ultrasonic energy.

f) (EG) Use dispersion dryer available from Proctor and Schwartz in Philadelphia and similar in design to small glass dryer at PDL for drying and expanding tobacco.

g) (WWS) Use whizzer separator made by Sturdivant or the C. E. Raymond Division of Combustion Engineering to heat and expand high moisture-containing tobacco. The whizzer separator operates in such a manner as to classify materials of different density. As a result, high moisture-containing dense tobacco will be retained and low moisture-containing expanded tobacco will be expelled.

h) (LJD) Encourage water permeation of tobacco by vacuum infiltration, i.e., evacuate tobacco in the presence of water then pressurize, then evacuate, etc.

i) (RMI) Add 25 or more percent water to tobacco, then pressurize, then drop tobacco into Jetstream dryer.

j) (RMI) Use gas such as helium having a high heat capacity for drying and expanding tobacco.

k) (WWS) Use gas having high U factor, recognizing the need to combine high heat capacity and high gas density.

III. Methods Involving the Use of Pressure, Water and Heat

- a) (RMI) Reactivate study of Guardite process using little Guardite unit previously available in New Products.
- b) (RMI) Use popcorn principle.
- c) (RSS) Use principle employed in certain snack foods which appear to be extruded and puffed.
- d) (HEW) Treat tobacco with appropriate type of starch so that following expansion the enlarged structure is retained as in popcorn.
- e) (ECC) Enzymatically hydrolyze tobacco cellulose in an attempt to form material which will retain expanded structure.
- f) (RMI) Contact food puffers for ideas.
- g) (WWS) Put tobacco cutter in pressurized chamber so that as the tobacco leaves the cutter it goes from a high pressure to a low pressure zone. Alternatively, pass cut tobacco immediately from the cutter into a zone maintained at low pressure.

IV. Methods Involving the Use of Blowing Agents

- a) (RMI) Use blowing agents.
- b) (RSS) Treat tobacco with carbonate, bicarbonate or other acid decomposable salt and then expose tobacco to acid in solution, as liquid or in vapor state.
- c) (BFP) Treat tobacco with calcium carbide.
- d) (WWS) Treat tobacco with a compound which forms a hydrate or otherwise takes up water and heat the thus treated tobacco to decompose the water-containing material, preferably the hydrate to be chosen from among those that decompose at a relatively low temperature.
- e) (ECC) Treat tobacco with calcium bicarbonate by forcing this compound into the tobacco under pressure, then heat.

V. Methods Involving the Use of Freeze-Drying

- a) (EG) Use an abbreviated freeze-drying method.
- b) (EG) Use freeze-drying method wherein the tobacco is evaporatively cooled.

- c) (PHL) Reopen contacts concerning freeze-drying with Food Machinery Corp.
- d) (EG) Use microwave energy in conjunction with freeze-drying.

VI. Miscellaneous

(RMI) Select from vapor phase constituents of smoke suitable compounds for treating tobacco.

A handwritten signature in black ink, appearing to read "J. B. Heake". The signature is written in a cursive style with a large, sweeping initial "J".

PHL:aw
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