Use of buttermilk as a coagulant for rubber latex

CONSOLATION

Shankara Patali, a 41 year old rubber planter, hails from Puttur Taluk of South Canara District in Karnataka and has been engaged in farming for the last eight years. A tenth standard pass out, he has always had the urge to do something different. He lives with his family consisting of his wife and two children. He has a monthly income of Rs.5000.

Shankara spends his spare time very constructively. He takes part in various gatherings and meetings related to agriculture like Krishimelas. Another interest of his is grafting different varieties of high quality Jackfruit, cashew-nut and mango saplings. Collecting different types of herbs is also a hobby. He loves to experiment a lot in the field of agriculture with whatever knowledge he has.

Address
Shri Shankara Patali
S/o.: Ambadi Patali
"Sri Raksha Nilaya"
Mahabaladka Estate
Post:Ishwaramangala
Tal: Puttur – 574 313
Dist: Dakshina Kannada
Karnataka

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Genesis

Shankara Patali has found that buttermilk has proved to be the "better" milk option and is better than formic acid or acetic acid for the coagulation of natural rubber latex. Usually acids are used to coagulate rubber latex into rubber sheets but some people are allergic to acids and transportation and handling of acids is hazardous. Once while discussing the problem with his colleague he came to know about the danger of acid burns caused to the men working on the sheets. This made Shankara think of a safe option. The ubiquitous buttermilk as a replacement for chemicals was an idea that came to Shankara Patali one day as he watched the latex "curdle" on addition of formic acid, pretty much in the manner that milk gets converted into curd. Then he thought of using natural products that showed acidic properties.

Shankara lost no time in putting his theory to test and tried various combinations and proportions of buttermilk, tamarind juice, toddy and limejuice. Initially the rubber was not coagulating properly because the buttermilk used was not very sour. Then he tried buttermilk which was very sour, and got good results. It took him nearly one year to arrive at the right kind of buttermilk to use in order to make good quality rubber sheets. The latex was just as responsive to buttermilk as it had been to formic acid. Shankara has been using this method for the past two years.

The method

Rubber is usually sold in the form of sheets. The first step in rubber making is tapping latex from rubber trees. This latex is then poured into trays and according to the density of the latex, water is added to form a solution. This solution is coagulated into thin slabs of coagulum for which chemicals such as acetic acid or formic acid must be added. Depending upon the density of latex, climate, water content and the weight of the solution, these acids are used. Normally to make a

rubber sheet weighing ½ a kilo, 100ml of formic acid (5%) is used. These slabs are then converted to sheets through rollers.

In Shankara's technique, on the first day of preparing rubber sheets, 250 ml of water and around 150-250 ml of sour buttermilk is added to two litres of filtered latex in the tray and is churned well till the froth is formed .The froth formed is then removed immediately. The same procedure is followed for the first four days. On the fifth day the sheet is passed through the rollers so that the sheet becomes thin and extra water is drained out of it. This water is collected and kept aside for three days so that it gets fermented. This step should be followed regularly. Then on the fifth day, the use of buttermilk is discontinued and instead of it the fermented liquid is used. The amount of this liquid, to be used varies from season to season i.e. 300-500 ml in winter and 150-250 ml in summer. This is done because the density and consistency of latex varies according to climatic conditions and time period. While processing grade sheets, the drained fermented water should be thoroughly strained and used. If the process requires making sheets on the same day, fermented water should be added twice more than the normal quantity and less than 250ml or no water must be added.
If the latex is being processed once in two days, it is advisable to use the drained water as such without allowing it to ferment- during winters (250-300ml) and during summers (150-200ml) on the same day. The quantity of buttermilk to be used will to some extent depend on the seasonal variations, temperature, and the latex quality. The older the buttermilk or fermented liquid the greater the effect and lesser quantity needs to be used.

Advantages

The rubber sheets made in this manner are of superior quality and better colour and fall in the top RSS-4 Grade. Buttermilk being a totally organic product, there are no side-effects or allergies for people handling them as in the case of acids or chemicals. This treatment also reduces the fungal attack on sheets. Buttermilk is available at home itself where as acids must be bought from outside. It is economical as the farmer saves Rs. 500 per acre per year by using buttermilk. The fact that this development, using a locally available substance, helps reduce processing costs by 80% makes it an idea whose time has come. The process is simple, less expensive and water is also conserved.

Peer appreciation sustains the spirit

Several farmers around Puttur and Sullya have now started using buttermilk and for them, it's a win-win situation all the way. All those who came to know about it are adopting this technique. Shankara Patali describes his brush with innovation as a fantastic experience. Especially in the light of the appreciation he received from neighbours and various organisations for this innovation. Throughout the process of innovation, he received full support from his family. Banks and Agricultural universities also responded well and he was awarded a certificate by the Syndicate bank, Badhiyadka during a "Krishimela".

Scientists claim that the use of organic substances for coagulation has been known in literature, but no recommendations were made because standardization of such substances might not be possible. They do appreciate the spirit of experimentation, however.
At the same time, not willing to rest on his laurels, Patali is clear that further research should be done on this procedure. Enthused by this experience he wishes to make more innovations.

Shankara feels that organisations like NIF are doing exemplary work in identifying and encouraging people at the grassroots. Especially as he considers that politicians and huge companies do not encourage such ideas as these would harm their personal interests.