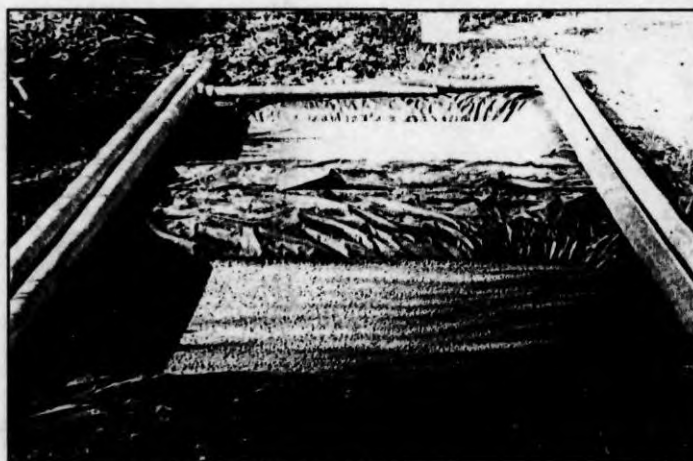


immobilized on organic matter content. The optimum temperature, at which the urease activity was consistently higher ensuring the continuous supply of plant available form of nitrogen at least for 20 days after fertiliser application, was worked out for individual zones. The optimum temperature for the soils of Anamallais and Wayanad was found to be 25°C, while for Koppa it was 20°C. In Munnar, Western end and Plateau zone soils showed for optimum hydrolysis at 20°C while the soils of Eastern end and lower elevation showed higher action at 25°C. Both Nilgiris and Vandiperiyar zone soils have shown optimum activity at 20-25°C. A sharp fall in ammonium ion concentration was noted in the soils when the temperature was raised to 25°C making more nitrate ion available in the soil. It is concluded from this study that since the temperature between 20 and 25°C was found to be ideal for urea hydrolysis, urea application during peak winter (December and early January) will be avoided.

Source : S. Venkatesan and V. Sudhakar,  
UPASI TRF, Valparai, Coimbatore, Dist.)

### **Azolla as a feed for cows in coconut based mixed farming system**

*Azolla* is a small floating water fern that can be used as a feed for animals since it is rich in proteins and minerals. In this context, in coconut based mixed farming system at CPCRI (RS), Kayangulam involving cows as one of the components, *Azolla* was used as feed supplement for cows. *Azolla* was grown in small pits with plastic sheet at the base



of the pits. In about 3 days, the fern doubles itself and the fresh *Azolla* is fed to cows. Daily, about 250g of *Azolla* is being fed to the cow, which is being relished by animals very well. It was observed that, the milk yield increased and there is possibility to reduce the concentrates, which is very costly in the market.

### **Growth promoting vermiwash from coconut leaves**

Coconut leaf vermiwash has been found to possess good plant growth promoting and soil microflora enhancing properties. This was observed from the 48% enhancement of seedling vigour in cowpea, increase in number of leaves and root length in nutmeg seedlings and enhanced population of rhizosphere micro-organisms.

(Source: CPCRI, Kasaragod)

## **Francois Fresneau 'discoverer' of the 'rubber' tree:**

The 300th birth anniversary of Francois Fresneau (1703-1770) was observed during 2003. Modern rubber industry owes to this French engineer for the wonderful discovery of the *Hevea* tree, for the first detailed description of it and the method of extracting latex and for conceiving and prophesying its industrial and commercial uses.

Fresneau was born on 29th September 1703 in Marennes, France. In 1728, he became a certified engineer and two years later, a certified astronomer. On August 1732, he was appointed as the royal engineer of Cayenne in French Guiana. His responsibilities included designing and construction of new fortifications for the town and vestigating about the local flora of the colony for identifying new plants, which are of potential use for the empire.

During the first visit (1732-37) to French Guiana, Fresneau spent five years in Cayenne. However, political intrigues and professional jealousy made the life of the young and enterprising engineer always difficult and often unpleasant. At last, he returned to France in 1737 and married Cecile Solain-Boron on 10th June 1738.

Again, Fresneau returned to Cayenne in 1739 along with his wife and spent another nine years. Those were the worst period of his whole life. Twice he handed in his resignation, but each time he was refused.

However, on 9th November 1740 he obtained the approval for his design for the fortifications. He accomplished his task satisfactorily and was honoured with several

decorations. During his continued stay at Cayenne exploring the flora of Guiana, he discovered the '*Hevea*' rubber tree. He called it 'syringe tree'. In his letter dated 19th February 1746, Fresneau made the first reference to the syringe tree, with which the natives had produced syringes and other curios articles.

Finally, Fresneau's retirement was granted during the early month of 1748. He returned home in ill health. Worn out by the unpleasant life in Cayenne, his wife Cecile Solain-Baron died. He married Anne-Marie Horric de Laugier in 1751 in Marennes and lived with Charles, the only surviving child of his first marriage.

It was during the stay at Marennes that Fresneau prepared his historic 'Memoire' which provided the first detailed descriptions of the 'syringe tree', physical properties of its elastic resin and its potential uses in the west. Fresneau sent this report on 17th June 1749 to M. Rouille, the then minister, with a request to forward the same to French Academy of Sciences for review. Accordingly, the report was sent to the Academy where it was handed over to Charles Marie de la Condamine, the renowned geographer and astronomer for review.

Condamine had already acquaintance with the syringe tree during his expeditions to Peru and despatched a few samples made of the elastic resin to the Royal Gardens in 1736. In his report about his travels in Central America, La Condamine referred to a resin called

'Cachuchu' in 1743. Being an astronomer and geographer, he did not attach any significance to the elastic resin and considered it only as a 'curiosity'.

However, when Condamine received Fresneau's report from Minister Rouille, he was well conceived of the industrial and commercial potentialities of the elastic resin. He presented it before the Academy on 26th February 1751 and later published it in 1755 with his introductory remarks.

According to Fresneau's descendant and biographer, Chassloup Laubat, the discovery of turpentine as a solvent for rubber was due to Fresneau. In 1762, Fresneau sent an account of his invention to M. Bertin, the then minister. Laubat deduced that Bertin might have let L.A.P. Herrisant and P.J. Macquer, the rival scientists who were working on the same line see it. In 1763, Herrisant and Macquer were credited with the discovery of a solvent for rubber.

Fresneau died on 25th June 1770.

The nomenclature of syringe tree as *Hevea brasiliensis* was a much later historical event. In 1770, Joseph Prestley used the word 'rubbing' for the use of the substance for erasing lead pencil marks in his famous book on perspectives. The word 'rubber' became the name of elastic resin only during the early second half of the 19th century, more than 18 decades later.

Now *Hevea brasiliensis* provides more than 99 percent of the global output of natural rubber, which at present provides basic raw material for over 35,000 products. It is amazing to see how the prophetic foresight of Fresneau has become advantageous to the humanity.

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