BITE: a low impact tool for xylematic injections

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Abstract

Since the fifteenth century (Leonardo da Vinci, *Codex atlanticus*) injection of fluids in woody trees is performed drilling one or more deep holes in the trunk.

Limits in producing holes mainly consist in 1) need of a drill and a sharp bit, 2) removal of a great volume of vital wood, 3) considerable laceration, warming and partial devitalization of the cambial tissues in charge for the hole closure, 4) air suction during the production of the hole (cavitation; uptake slowdown), 5) long-term parasitic infections.

To overcome this age-old problem, in 2011 the University of Padova patented BITE ("Blade for Infusion in TrEes"), allowing the infusion/injection of liquids (pesticides, fertilizers, growth regulators, biostimulants, desiccants) into the xylematic system without preliminary holes.

The section of BITE's blade is lenticular and biconvex, able to separate the wood fibres with as little friction as possible, and avoiding huge ruptures of vessels, reducing cavitation and closure times.

Furthermore, the blade's shape and dimensions allow a gradual, temporary pressure of vessels, increasing the xylematic depression and fastening the spontaneous uptake of liquids (Venturi's effect).

An historical excursus of the trunk injection methods will be presented.