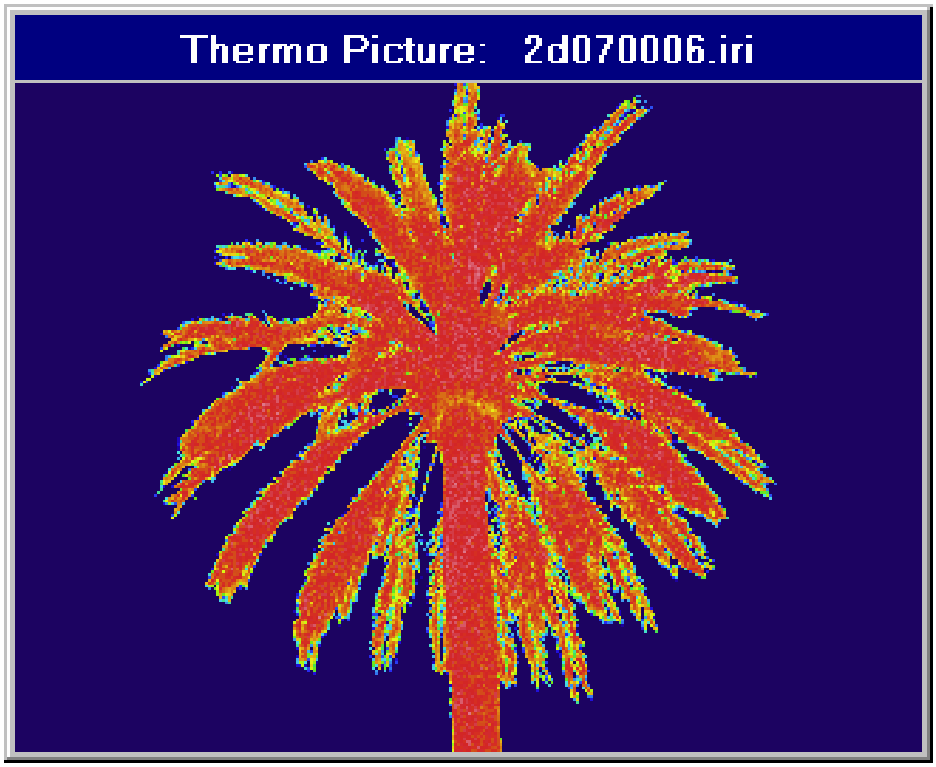
Alessandra Catena and Giorgio Catena

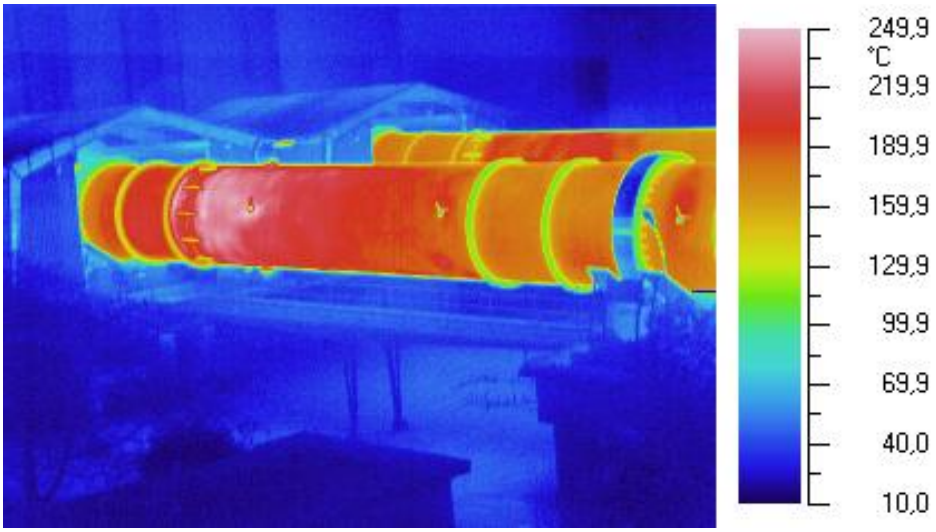
THERMOGRAPHY

a non invasive method to detect damage in trees

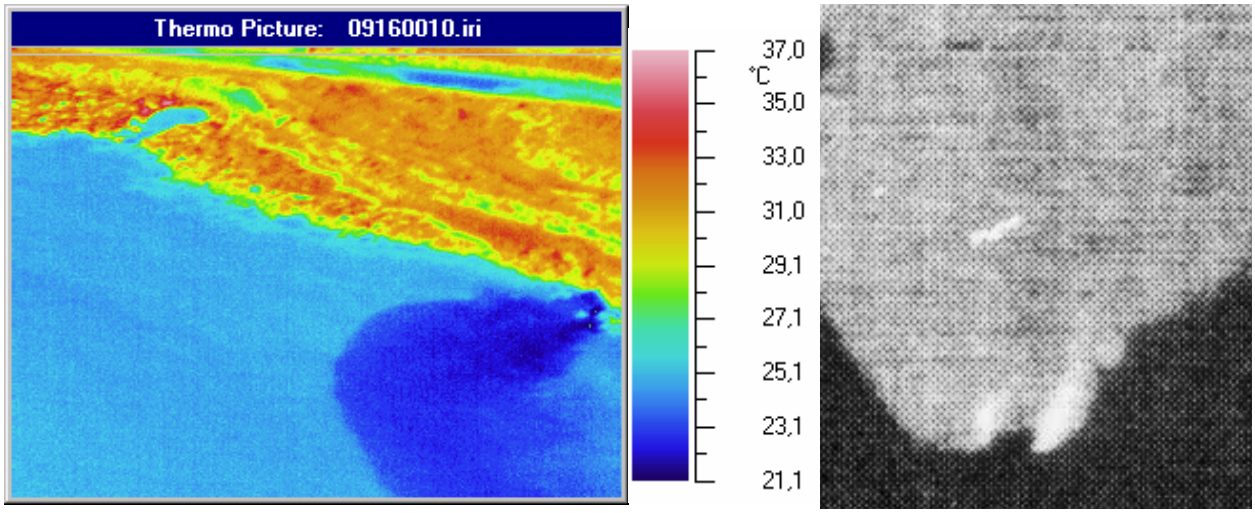


6th ISA European Conference
9th-12th June 2004, Maastricht, The Netherlands

Thermography points out the presence of damage or discontinuities in the studied bodies, by measuring the surface temperature distribution. The colour scale next to the image relates the colour to the measured surface temperature.



Rotating cement kiln



Submarine freshwater spring (Brindisi, Italy)

Underwater hot thermal springs (Vulcano island, Italy)

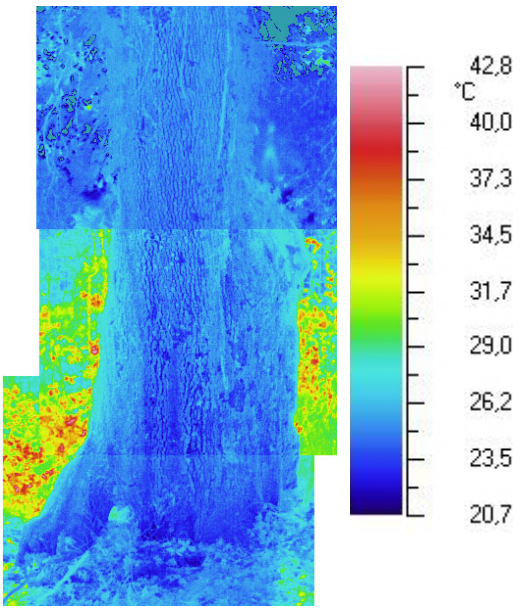
In the case of trees Thermography points out the presence of internal damage (root system, trunk, branches).

The thermal properties of a damaged area differ from those of a healthy one, therefore a different surface temperature can be found in the two areas.

Damage is generally indicated by a lower temperature.

Images are shown in real time in black-and-white or in different colour-palettes.

The standard lens allows the assessment of a tree from a distance of up to 20-25m.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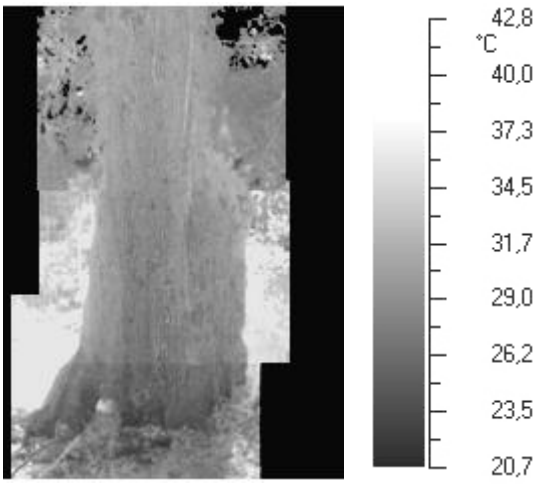
°C
40,0
37,3
34,5
31,7
29,0
26,2
23,5
20,7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°C
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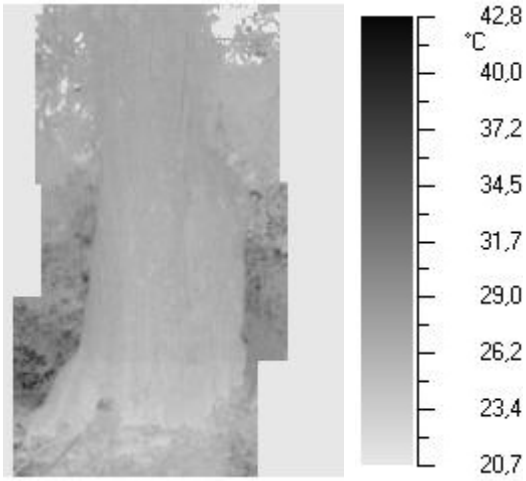
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°C
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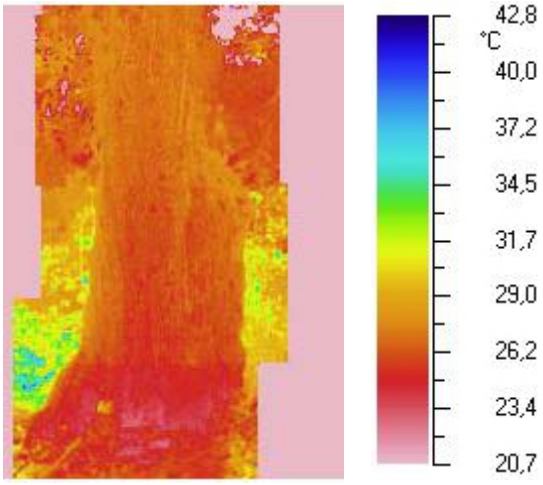
37,2
34,5
31,7
29,0
26,2
23,4
20,7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°C
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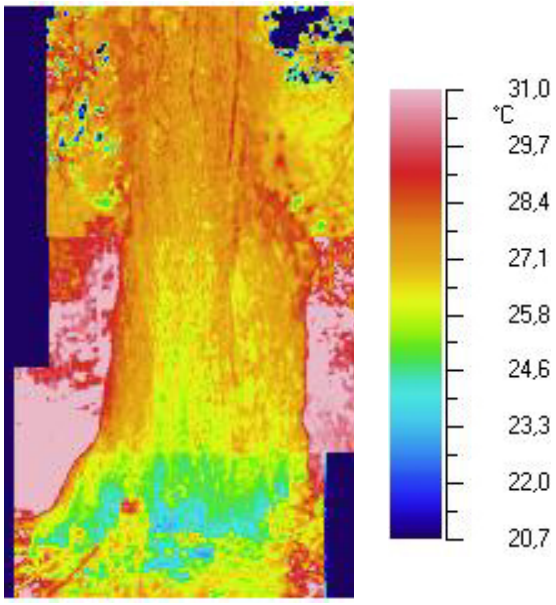
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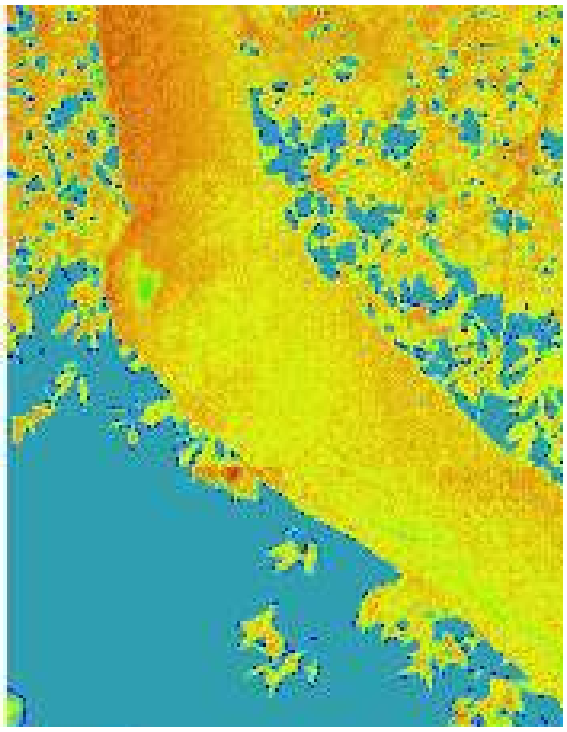
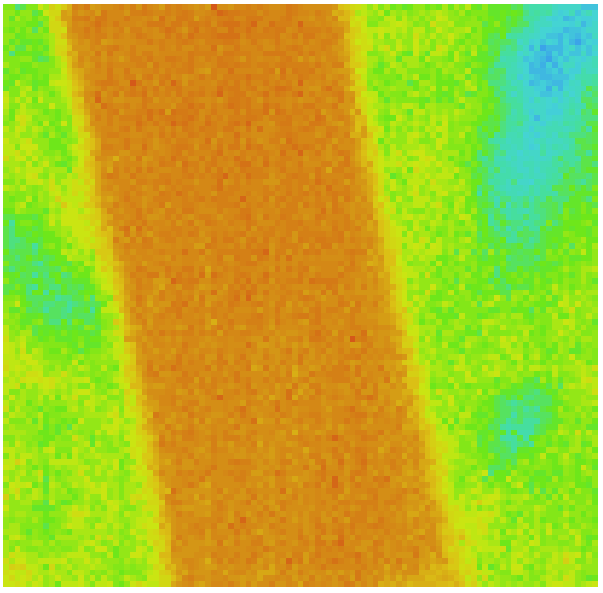
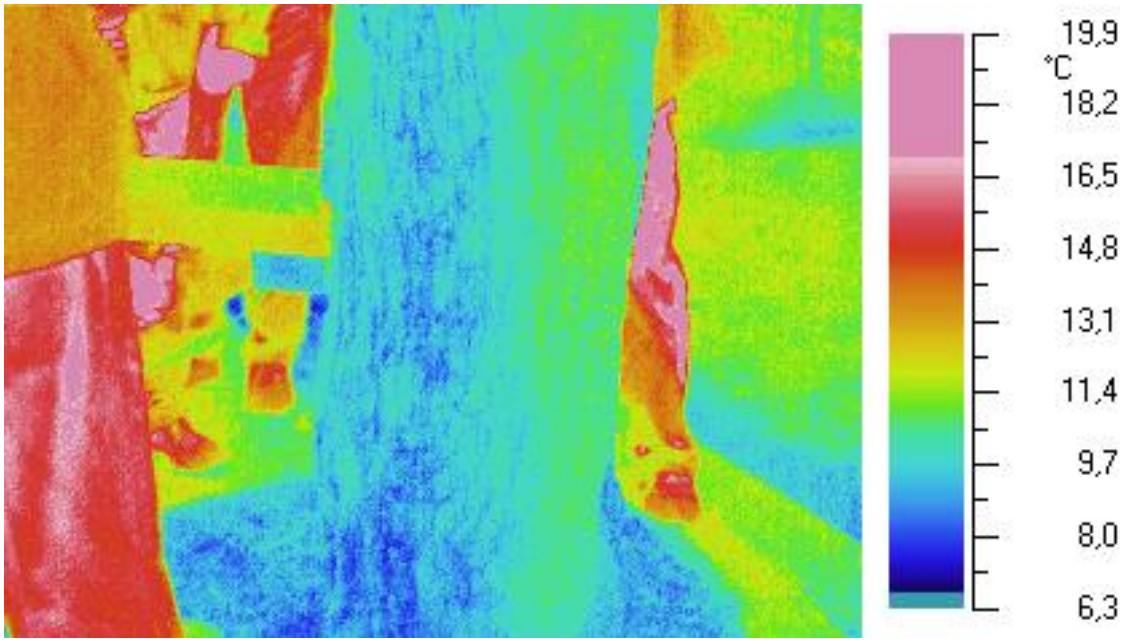
°C
29,7
28,4
27,1
25,8
24,6
23,3
22,0
20,7


29,4
°C
28,1
26,8
25,5
24,1
22,8
21,5
20,2
18,9




19,9
°C
18,2
16,5
14,8
13,1
11,4
9,7
8,0
6,3

Recent papers on thermal imaging of trees:

In English:

A. Catena, *Thermography Reveals Hidden Tree Decay*, Arboricultural Journal, vol.27, 27-42, 2003

In Italiano:

A. Catena, G. Catena, D. Lugaresi, R. Gasperoni, *La Termografia rivela la presenza di danni anche nell'apparato radicale degli alberi*, Agricoltura Ricerca, 189, 81-100, 2002

En Français:

A. Catena, *Thermographie et dendrodensimètre pour l'évaluation de la stabilité des arbres : comparaison de résultats*, Revue Forestière Française, en presse