

Fig. 1. Longitudinal section of the girdle of a 3-year-old lateral branch in 'Fuyu' 3 weeks after girdling. The left and right sides are the upper and lower cuts of the wound, respectively. The callus pads (cp) comprise 2 layers, and the outer layer contained more tanniferous cells than the inner layer. The inner callus comprised xylem elements (xy) and the outer, phloem elements (ph); the boundary between the 2 layers is the cambium (cm). Newly differentiated phellogen (pg) also produced on the surface of callus pads. Necrotic tissue persists between the periderm and callus pads. Bar: 500 μ m.

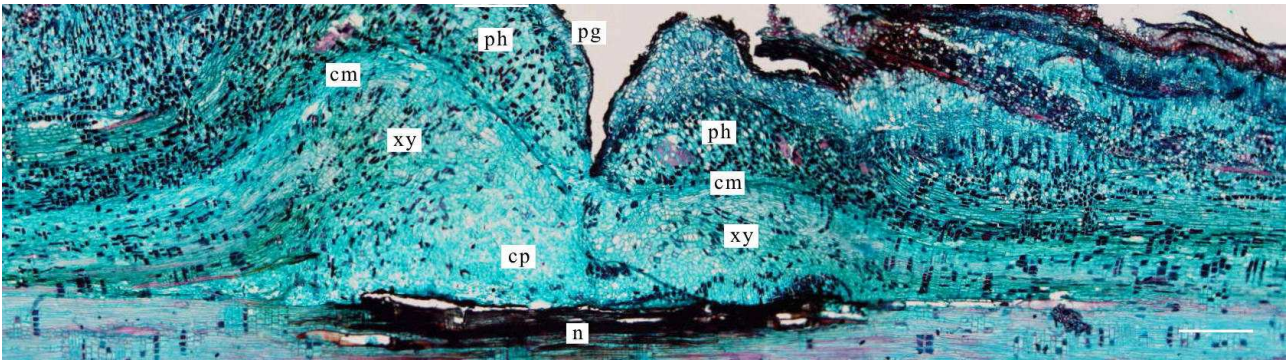


Fig. 2. Longitudinal section of the girdle of a 3-year-old lateral branch in 'Fuyu' 6 weeks after girdling. The left and right sides are the upper and lower cuts of the wound, respectively. The callus pads (cp) spread and merge. A few layers of exposed xylem become necrotic (n). The inner callus comprised xylem elements (xy) and the outer, phloem elements (ph); the boundary between the 2 layers is the cambium (cm). Bar: 500 μ m.

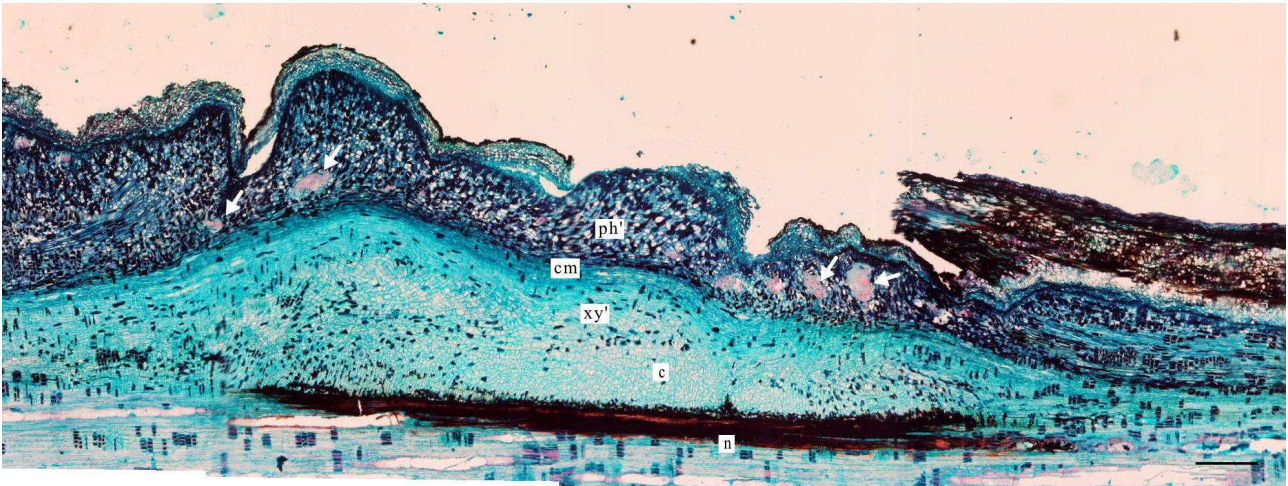


Fig. 3. Longitudinal section of the girdle of a 3-year-old lateral branch in 'Fuyu' 9 weeks after girdling. The left and right sides are the upper and lower cuts of the wound, respectively. The outer callus differentiated into mature phloem (ph') and the inner callus, into mature xylem (xy'). The elongation cell was located immediately lateral to the neocambium (cm), which would form the phloem tube element. Aging cells stained with safranin was dotted within the phloem (arrows). The innermost callus cells remained undifferentiated (c). A few layers of exposed xylem become necrotic (n). Bar: 500 μ m.

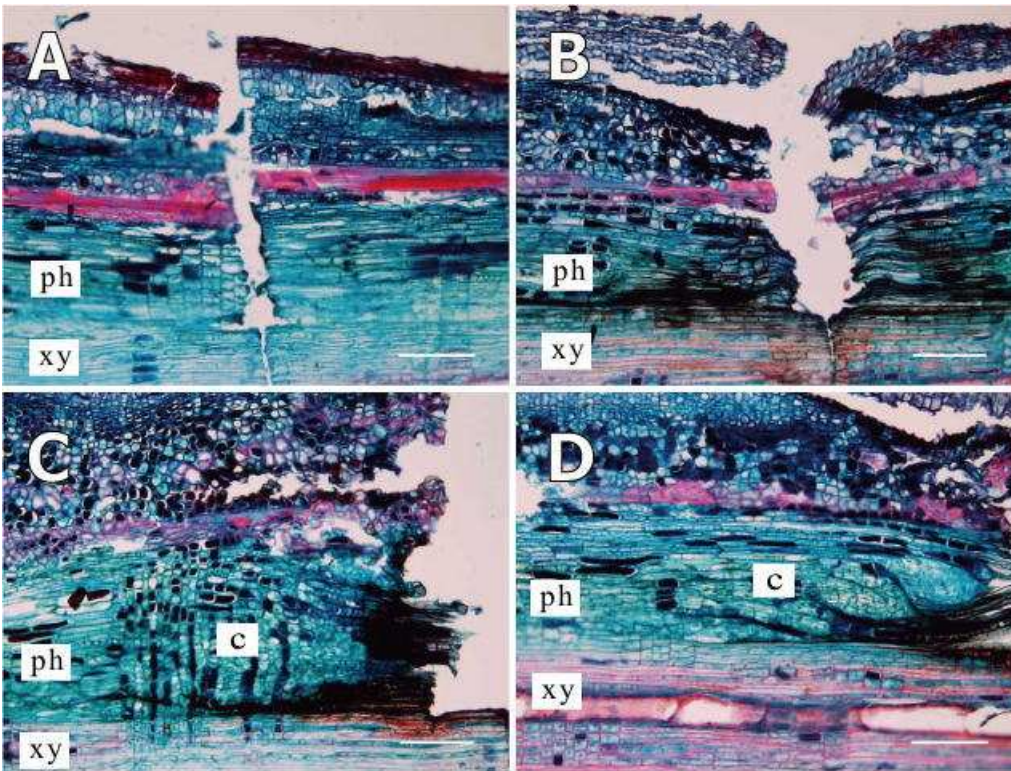


Fig. 4. Longitudinal section of a 2-year-old lateral branch in 'Matsumotowase-Fuyu' 0, 3, and 10 days after single scoring. At 0 days after scoring (A), the wound formed was approximately 0.08 mm in width. At 3 days after scoring (B), some layers of parenchyma cells showed signs of necrosis. At 10 days after scoring (C and D), phloem parenchyma cells (ph) dedifferentiated and began forming callus (c). Phloem parenchyma cell and vascular cambium became necrotic but periderm remained unchanged. Bars: 200 μ m. xy: xylem.

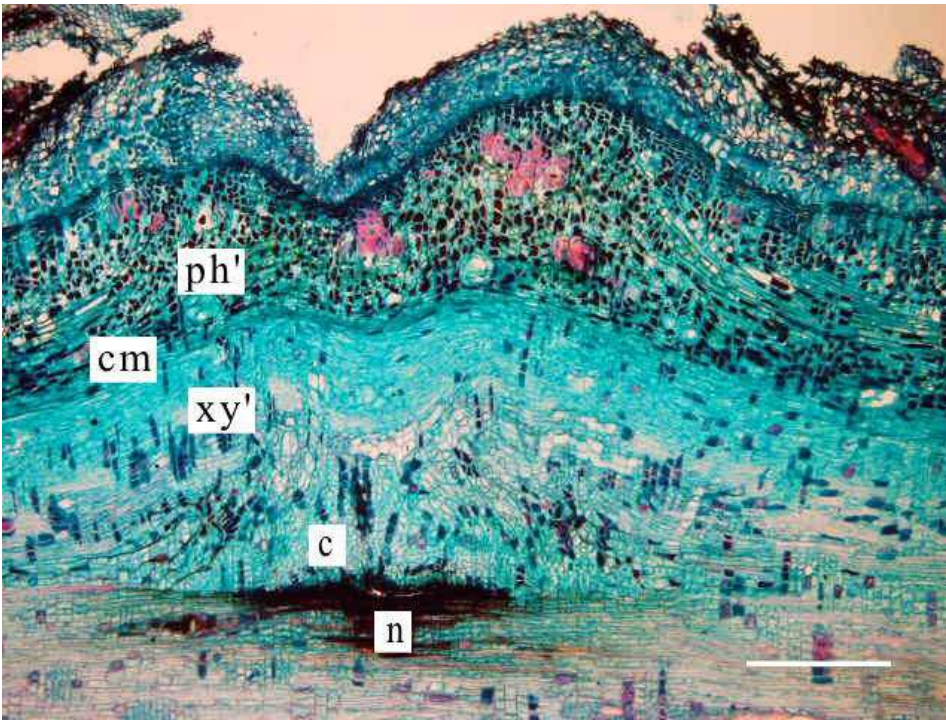


Fig. 5. Longitudinal section of a 2-year-old lateral branch in 'Matsumotowase-Fuyu' 30 days after single scoring. The right and left sides are the upper and lower cuts of the wound, respectively. The wound healed completely. Callus differentiated into mature xylem (xy'), mature phloem (ph') and cambium (cm), but the innermost callus cells remained undifferentiated (c). The injured xylem turned brownish and became necrotic (n). Bar: 500 μ m.

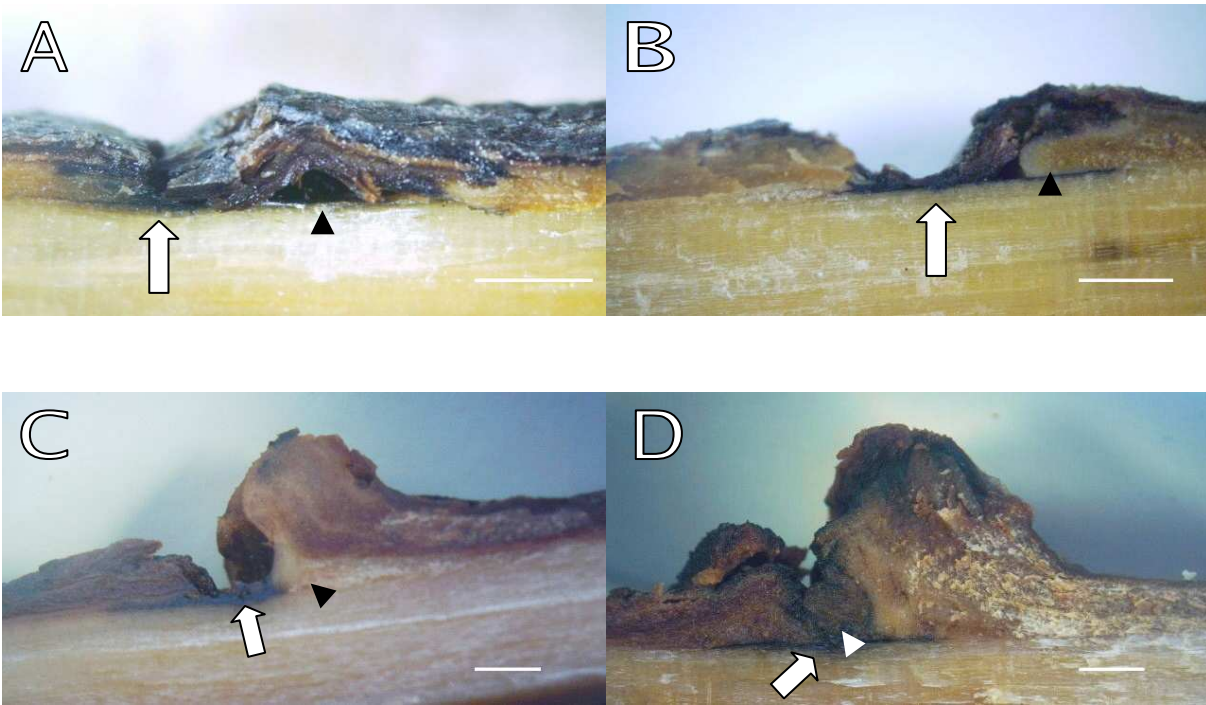


Fig. 6. Stereomicroscopic appearances of a 3-year-old lateral branch in 'Fuyu' 1, 4, 8, and 14 weeks after strangulation. The right and left sides are the upper and lower cuts of the wound, respectively. Arrows show depression occurring due to the wire. At 1 week after strangulation (A), the wire depressed the bark to become necrotic, and the bark above strangulation was warped (arrowhead). At 4 weeks after strangulation (B), callus was formed below the warped bark (arrowhead). Photo obtained immediately after removing the wire 8 weeks after strangulation (C). Callus spread outward along with the wire. The color of the outer and inner callus was brown and pale brown, respectively. The inner callus had already lignified (arrowhead). At 14 weeks after strangulation (D), newly formed callus (arrowhead) spread further bridging the gap caused by the wire. Bars: 2 mm.

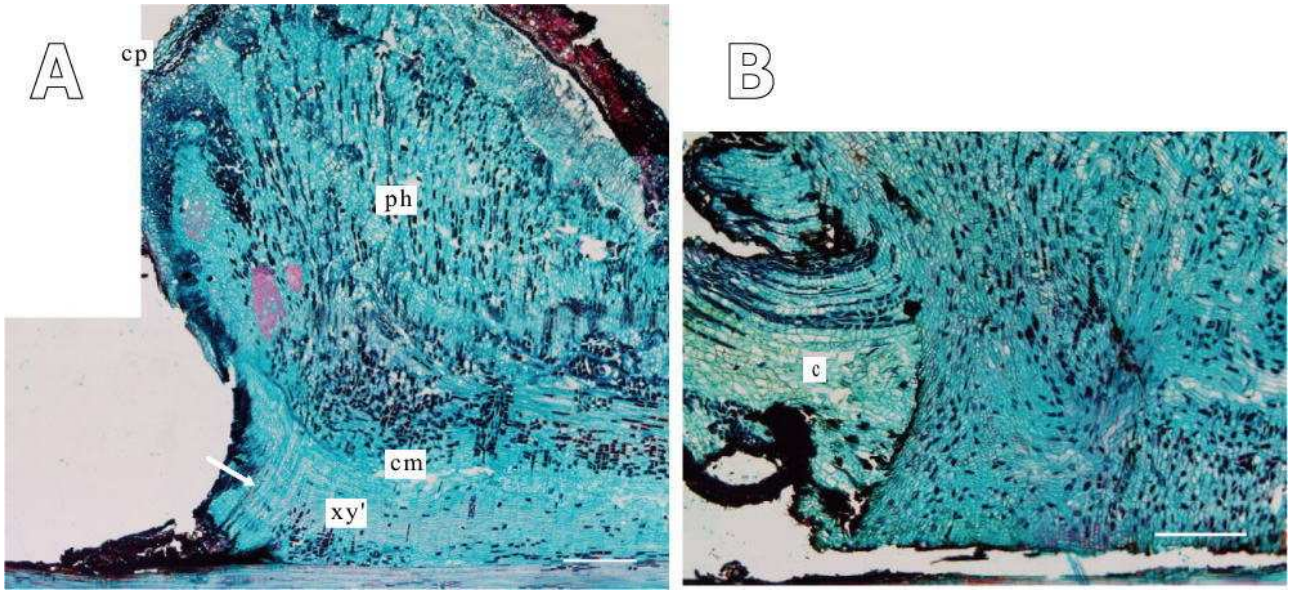


Fig. 7. Longitudinal section of a 3-year-old lateral branch in 'Fuyu' 8 and 14 weeks after strangulation. (A) Section of branch shown in Fig. 6C at the time of wire removal (8 weeks). The inner callus began to differentiate into mature xylem (xy') with ray tissue (arrow). The callus pad (cp) comprised phloem elements (ph) and cambium (cm). (B) Section of branch shown in Fig. 6D at 6 weeks after wire removal (14 weeks). Newly formed callus (c) spread forward to bridge the gap. Bar: 500 μ m.

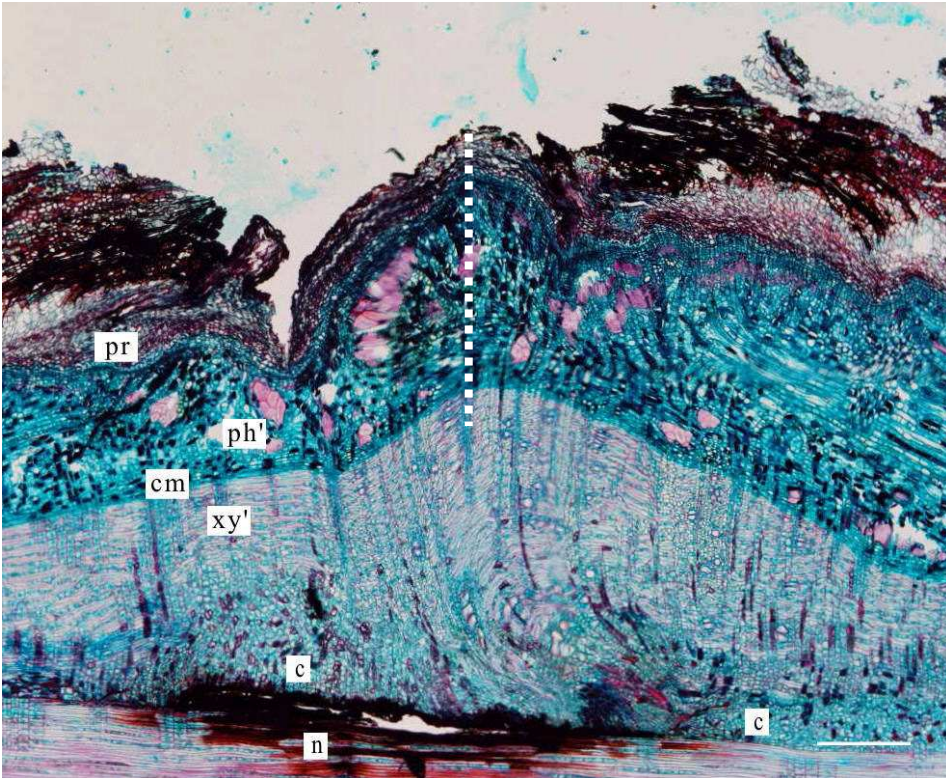


Fig. 8. Longitudinal section of a 3-year-old lateral branch in 'Fuyu' 18 weeks after strangulation (10 weeks after the removal of wire). The right and left sides are the upper and lower cuts of the wound, respectively. Callus completely differentiated into mature xylem (xy'), mature phloem (ph'), and periderm (pr), but the innermost callus remained undifferentiated (c). The injured xylem turned brownish and became necrotic (n). Bar: 500 μ m.

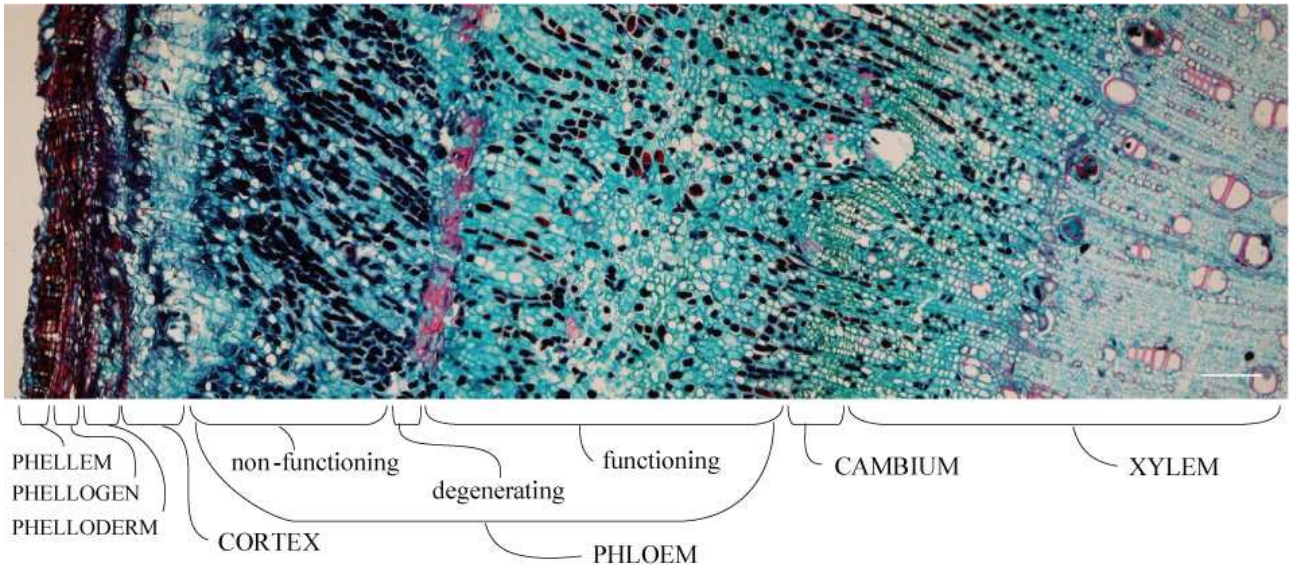


Fig. 9. Transverse section of the dashed line shown in Fig. 8. Bar: 500 μ m.