



Protection des jeunes plants: évolution technologique des manchons de protection en agroforesterie

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Contenu

- Contraintes de L'AF
- Evolution des technologies
- Applications

Contraintes de L'AF

- Etablir des arbres dans différentes milieux: culture, élevages, haies, etc...
- Synergie avec l'agriculture
- Favoriser la croissance juvénile
- Former des arbres adaptés au contexte particulier de l'AF
- Socio- Economique



Repérage

Protections



Courtoisie INRA, Agroforesterie – Des Arbres et des Cultures, Christian Dupraz et Fabien Liagre
Editions France Agricole, 2008

Etablissement & Survie

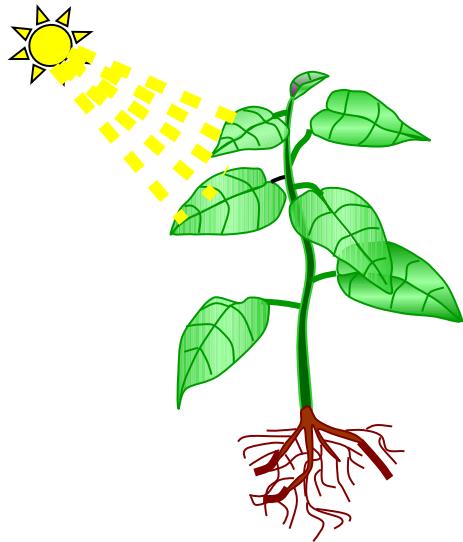
Croissance
juvenile
accélérée



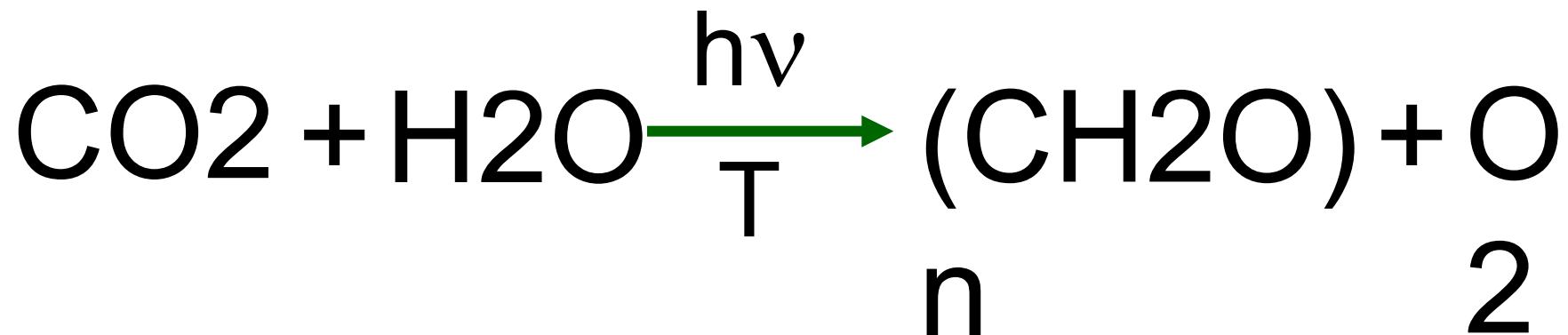
Evolution des technologies



- Photosynthèse
- Photomorphogénèse
- Réponse dynamique

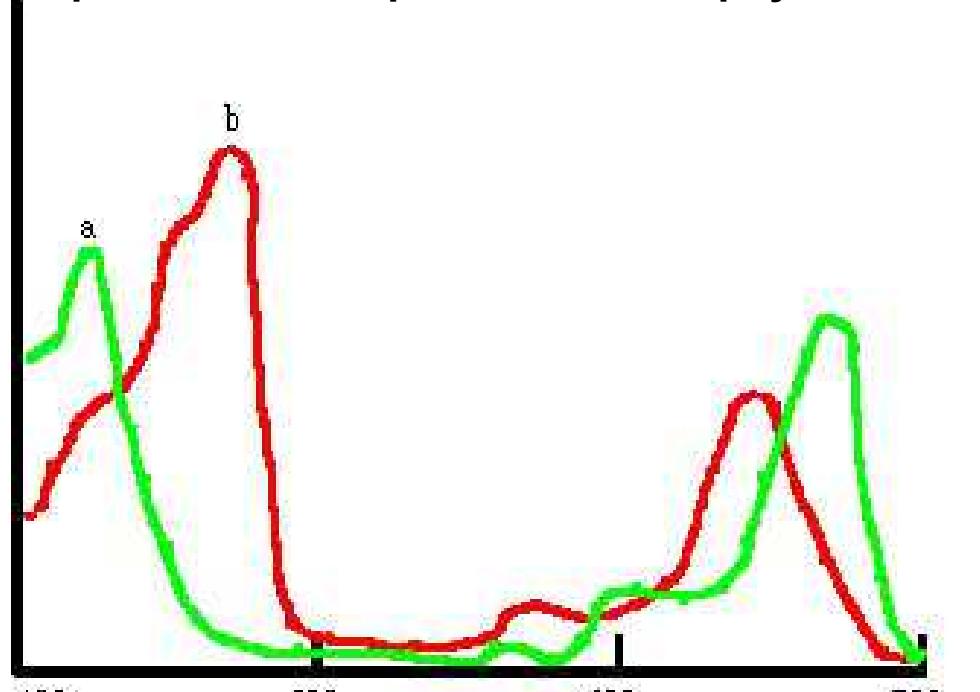


Photosynthèse



Photosynthèse

Spectres d'absorption des chlorophylles a & b

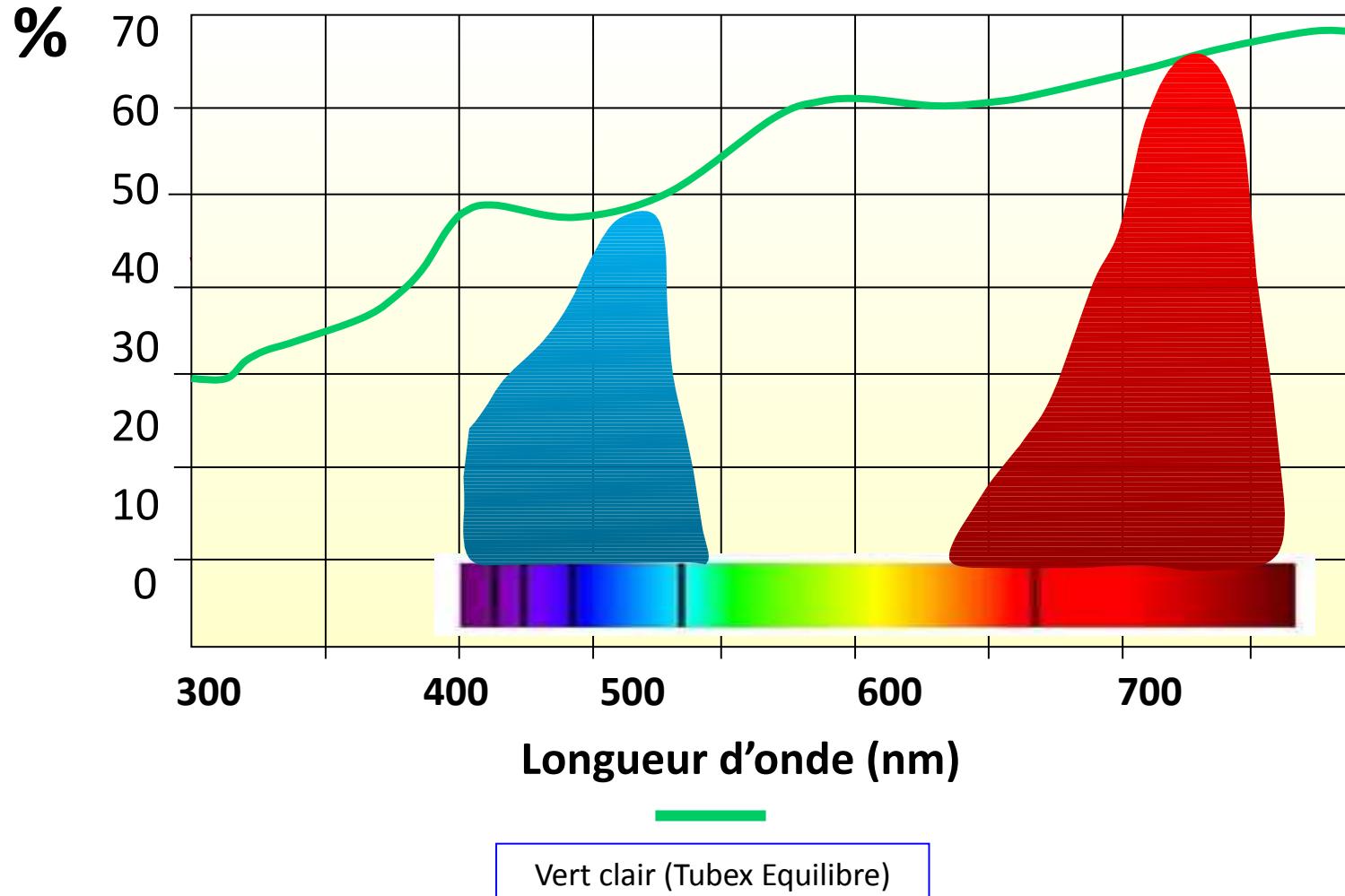


Longueur d'onde (nm)

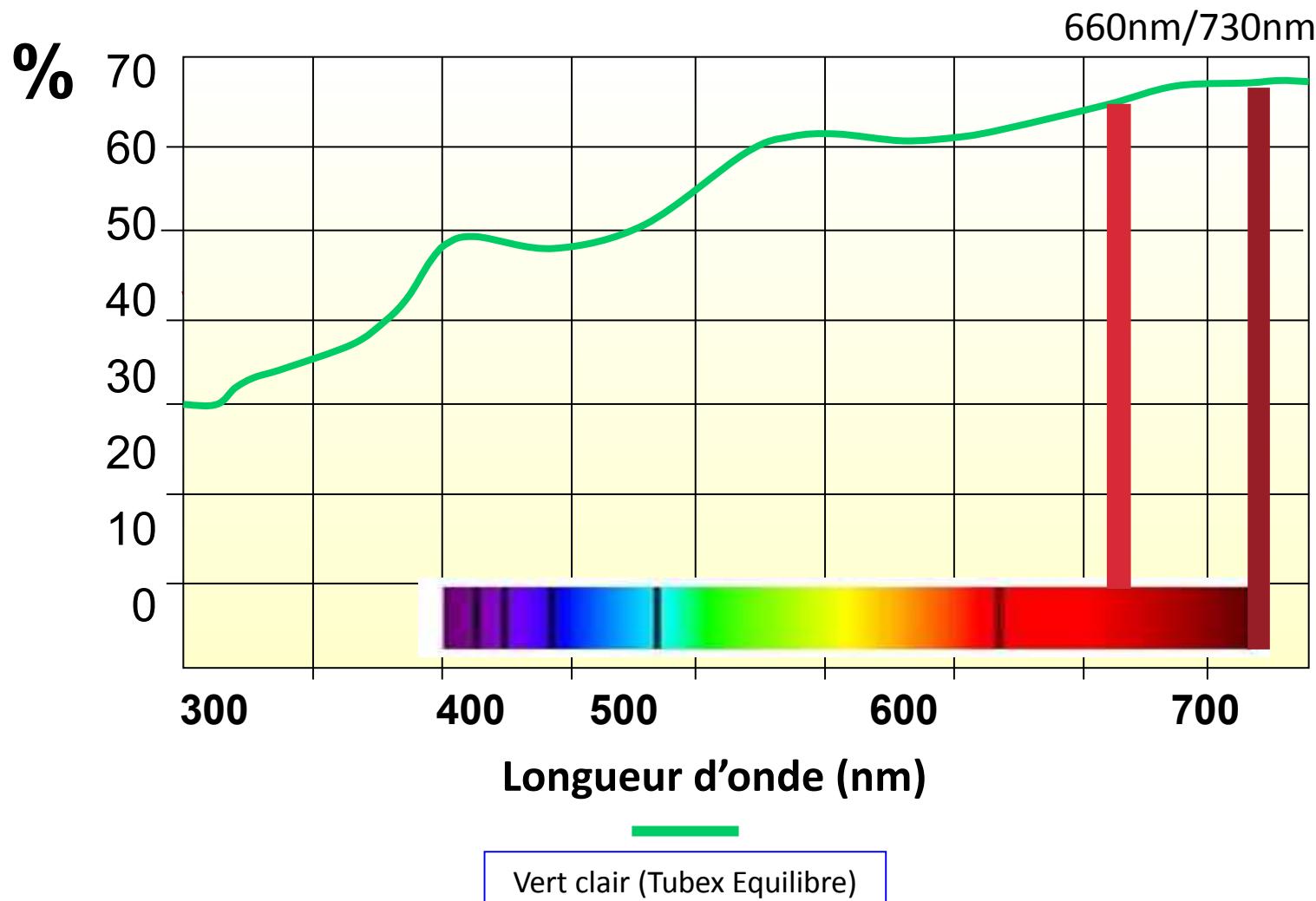


Spectre de la lumière visible

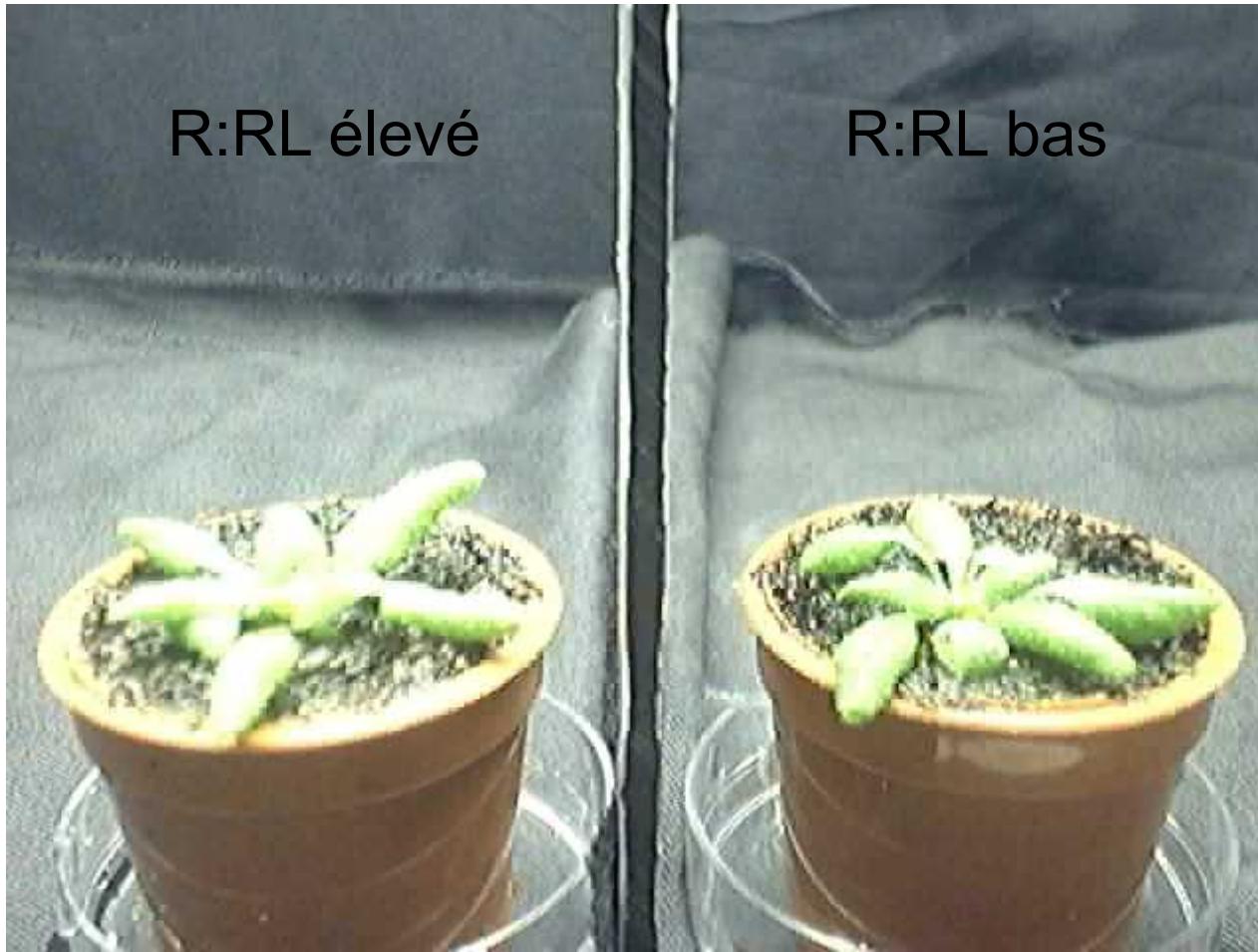
Photosynthèse



Photomorphogénèse



Photomorphogénèse



Arabidopsis Thaliana

Courtesy of Dr Kerry Franklin, University of Bristol

Sans Ventilation

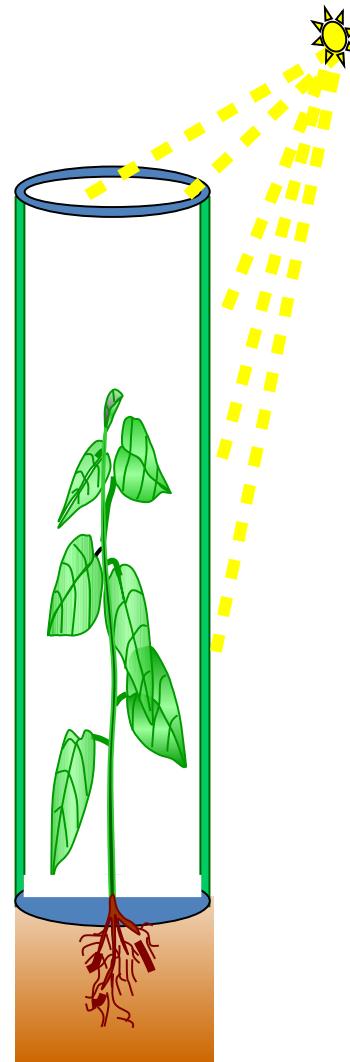
Standard

Tint > Text

Insolation

Isolation

Pas de
convection

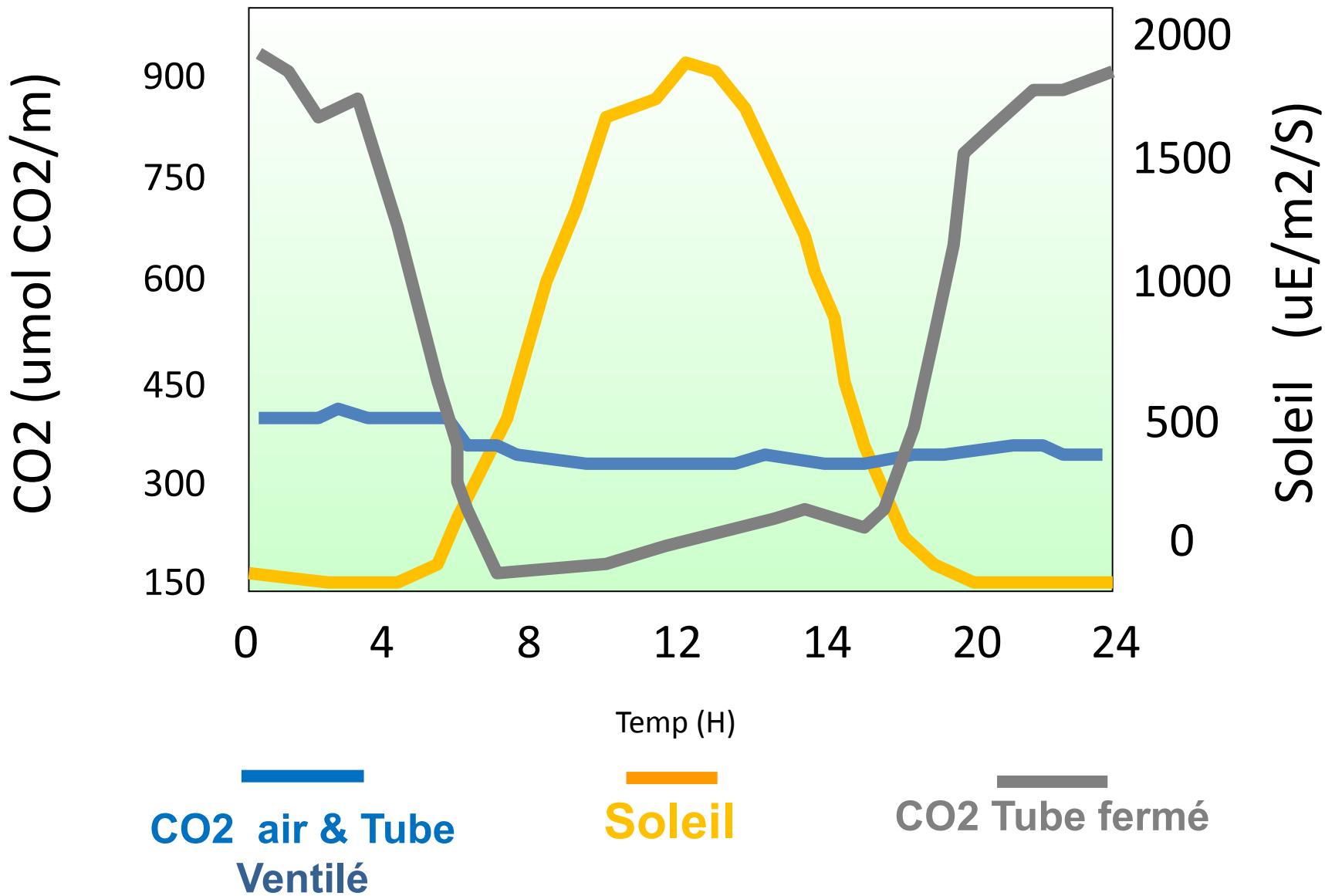


$HR_{int} > HR_{ext}$

Le DTV* décroît lorsque
l'humidité s'élève dans le
tube dû à la transpiration

Jour d'été

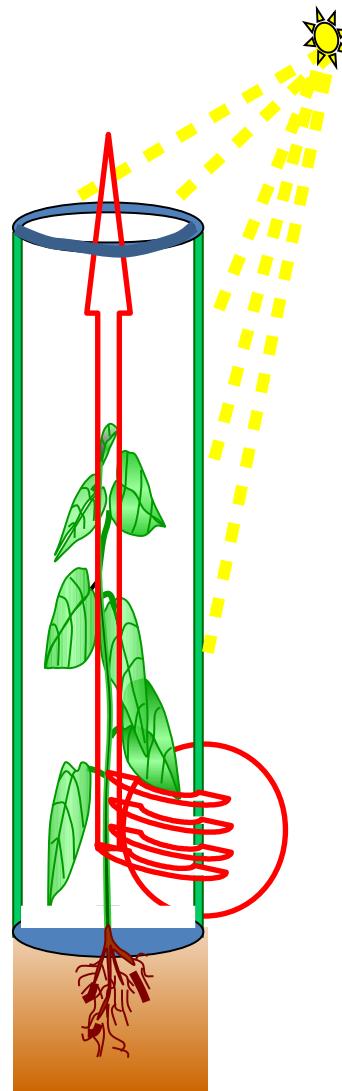
CO₂ et Soleil



Ventilation

$T_{int} = T_{ext}$

Convection

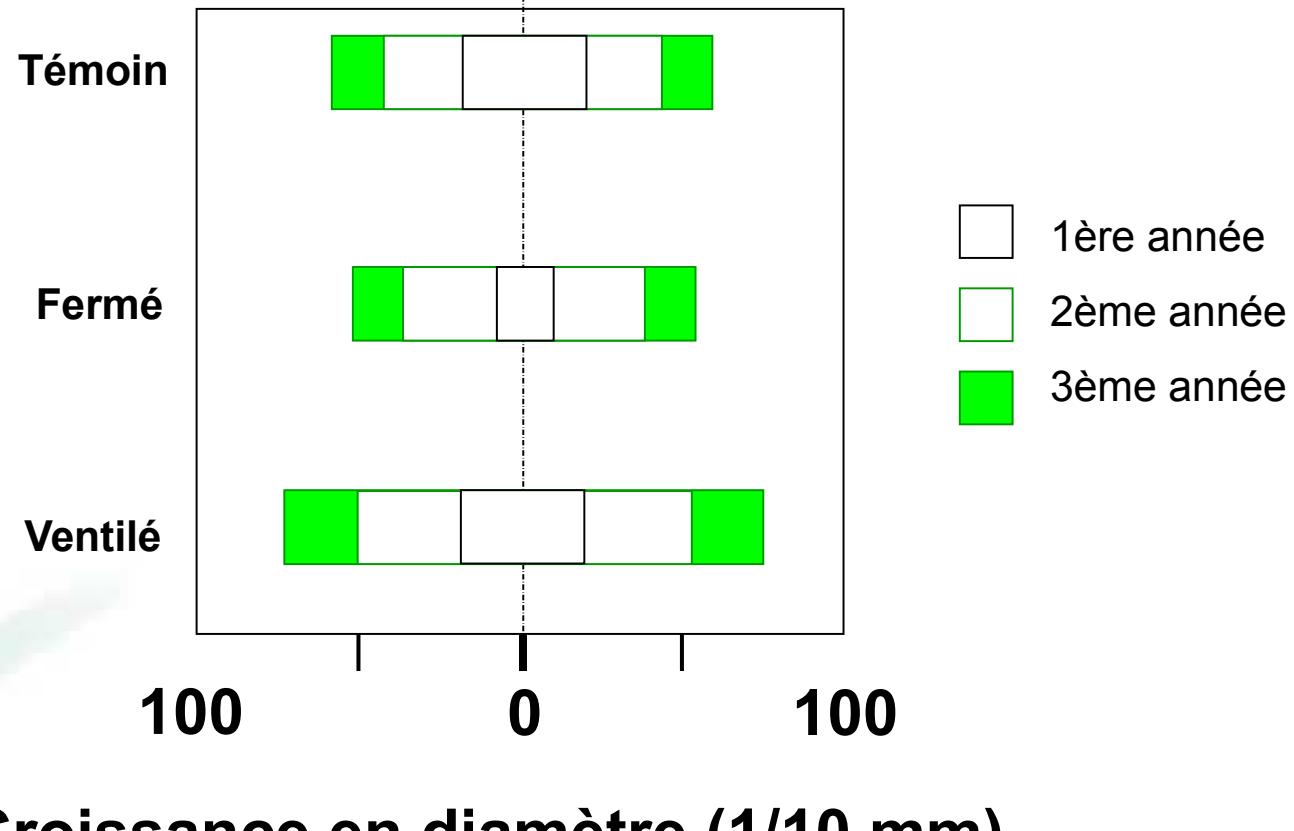


Ventilé

$H_{Rint} = H_{Rext}$

Équilibre en
humidité

Groissance de la tige



Noyer - Montoidre (Allier)

Agroforesterie

- Croissance axillaires minimisées
- Pas besoin d'opérations de taille de formation des arbres



Le développement des branches basses induit:

1. Ombrage sur les cultures
2. Complication dans l'utilisation des engins agricoles
3. Besoin d'expertise des ouvriers
4. Coût de la main d'œuvre

Agroforesterie en zone aride



Arganier

Evolution

Les demandes du marché



Fonctionne

Un manchon protecteur qui:

Disparaît

Offre Valeur

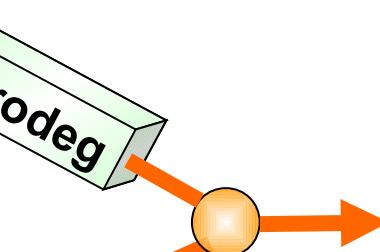
Concept



PP



**Bio
polymère**



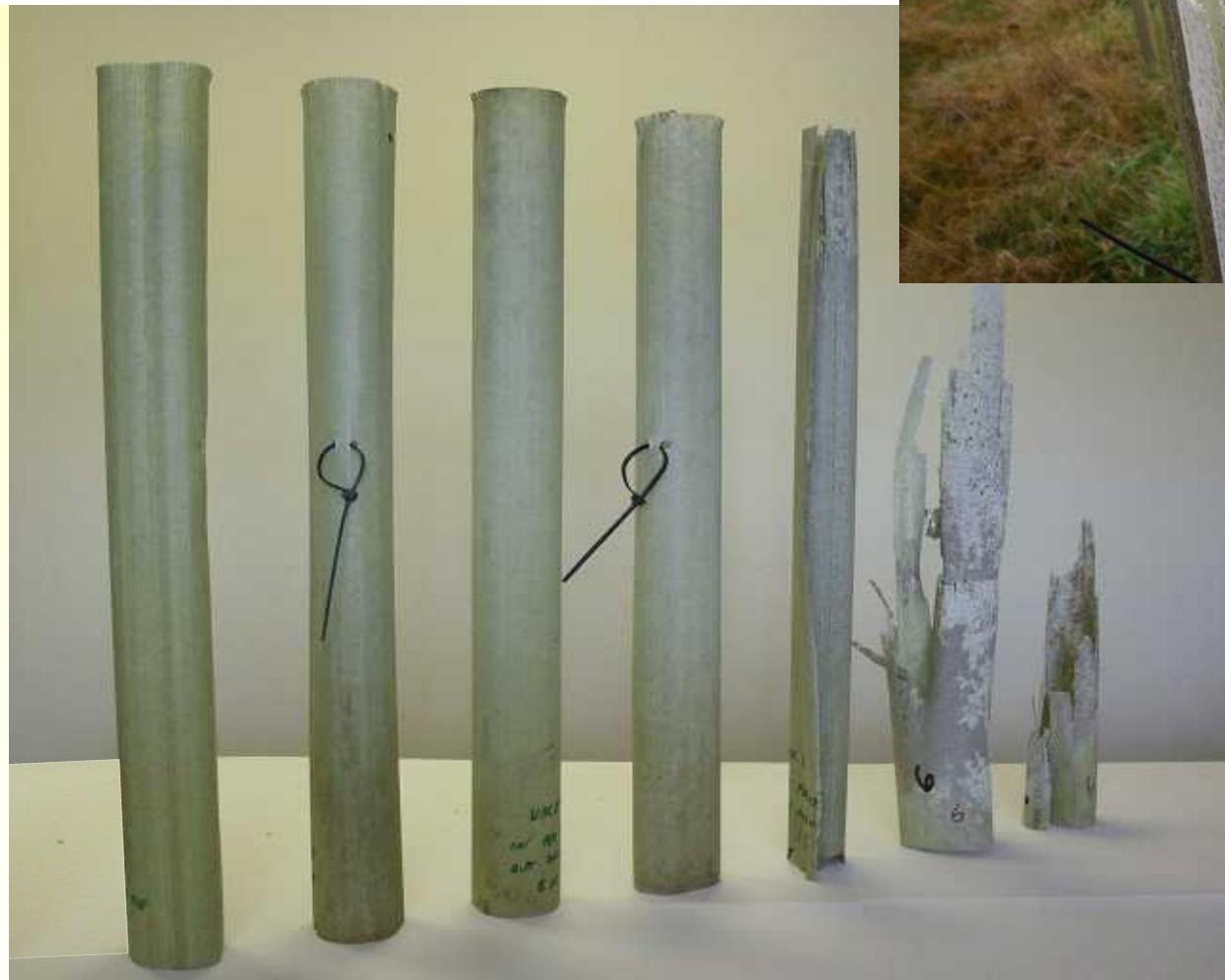
**OxoBio-
Bio**

Objectif 1 : Vitrine de demonstration



Champ Expérimental: Baden-Baden 2010

Objectif 2:





Merci !

Bibliography

- 1 Graham Due, ***The use of polypropylene shelters in grapevine establishment***, first published scientific trial on vineshelters, The Australian Grapegrower & Winemaker, June 1990, 29-33.
- 2 Treessentials, ***Seven growers share secret for success***, PWV, September/October 1997, 33-40.
- 3 Richard Smart, ***Growing young vines in tubes***, Smart viticulture, May/June 2000, 94-95.
- 4 Graham Due, ***Big growth increases with vineyards depend on soil***, The Australian Grapegrower & Winemaker, October 1999, 34-36.
- 5 Graham Due, ***Rapid early vine growth depends on soil penetrability***, The Australian Grapegrower & Winemaker, September 2000.
- 6 Graham Due, ***Vineguards – How hot inside?***, Victorian Viticulture News, Winter 1999.
- 7 Graham Due, Big increases in growth and returns are being achieved reliably with vineguards, October 1998, 79-82.
- 8 Vented treeshelter; upper ventilated treeshelter from Tubex Limited.
- 9 Peter Dry, ***Analysing the effectiveness of vineshelters***, The Australian Grapegrower & Winemaker, November 1996, 49-50.
- 10 Graham Due, ***Success with vineshelters***, PWV, Nov.- Dec. 1996, 39-44.
- 11 Frédéric Herrada, ***Essai de manchon de protection de plantiers de vignes***, Lycée Professionnel Agricole et Viticole d'Orange, 2004.
- 12 Bernd Prior, ***Erfahrungen beim Einsatz von Rebschutzrohren in Junganlagen***, Vineyard show Nieder-Olm, 2001, 6-11.
- 13 German article unknown origin.

Bibliography

- 14 D. van Schalkwyk, ***Growth tubes for establishment of vineyards***, Wynboer, www.wynboer.co.za/recentarticles/0600growhtubes.php3
- 15 Graham Tuley, ***report***, British Forestry Commission, 1979.
- 16 Antonio Lavezzi, Giovanni Pascarella, Diego Tomasi, ***Esperienze d'impiego di protezioni verticali (shelters) in giovani barbatelle di vite***,
- 17 G. Due, M. Barlass, G. Hardy, ***Micropropagated vines establishment substantially better in polypropylene shelters***, ANZ Wine Industry Journal, May 1991, 6(2), 139-140
- 18 James Lang Brown, ***Treeshelters, use and misuse***, Forestry & British timber, 1999, June, 24-28.
- 19 Burger, D.W, P. Suma, R. Harris, ***Treeshelter use in producing container grown trees, Hortiscience, 1992, 27(1), 30-32.***
- 20 Burger, D.W, G.W. Forister, P.A. Kiehl, ***Height, caliper growth, and biomass response of ten shade tree species to treeshelters.*** J. Horticult., 1996, 22(4), 161-6
21. Kittredge, D.B, M.J. Kelt, P.M.S. Ashton, ***The use of treeshelters with northern red oak natural regeneration in Southern New England.*** North J. Appl. For. 1992, 9(4), 141-5.
22. Kielgren R. ***Growth and water relations of Kentucky Coffee tree in protective shelters during establishment.*** Hortiscience, 1994, 29(7), 777-780.

Bibliography

23. Kielgren R. L.A. Ruff. ***Establishment in treeshelters I. Shelters reduce growth, water use, and hardiness but not drought avoidance.*** Hortiscience, 1999, 32(7), 1281-3.
24. Kielgren R. D.T. Montague, L.A. Ruff. ***Establishment in treeshelters II. Effect of shelter color on gas exchange and hardiness.*** Hortiscience, 1997, 32(7), 1284-7.
25. Lantagne D.O. C.W. Ramm, D.L. Dickmann, 1990. ***Treeshelters increases heights of planted oaks in Michigan.*** North J. Appl. For, 1990, 7(1), 24-26.
26. G.J. Mathead L.R. Boothman, ***The effect of treeshelter height on the early growth of sessile oak,*** Forestry, 1997, 70(2), 151-5.
27. Mecum K.A. ***An evaluation of selected environmental factors affecting northern red oak growth in tubular plastic treeshelters.*** MS Thesis, PSU, Pennsylvania. 1995.
28. Potter M.J. ***Treeshelters improve survival and increase growth rates.*** J. For. 1988, 86(8), 39-41.
29. Potter M.J., ***Treeshelters.*** For. Comm. Handbook. 1991, No. 7, 48 p.
30. F.L. Rendel, ***The influence of treeshelters on microclimate and growth of oak.*** Proc. Smith of the Nat. Hardwoods Programme, Oxford For. Inst., Oxford, England. 1985, p. 8-16.
31. Smith M.C. ***Development of red oak seedlings using plastic shelters on hardwood sites in West Virginia.*** USDA. For. Serv. Res. Pap. 1993, NE-672, 7 p.

Bibliography

32. Tuley G. **Treeshelters**. P12 in Forestry commission report on forest research, Edinborn, Scotland, UK.
33. Tuley G., **Shelters improve the growth of young trees in the forest**. Quart. J. For. 1983, 77, 77-87.
34. Tuley G, **The growth of young oak trees in shelters**. Forestry, 1985, 58(2), 191-195.
35. B. R. Swistock, K.A. Mecum, W.L. Sharpe, **Summer temperatures inside ventilated and unventilated brown plastic treeshelters** in Pennsylvania, NJAF, 1999, 16(1), 7-10.
36. M.R. Dubois, A.H. Chappelka, E. Robbins, G. Somers, K. Baker, **Treeshelters and weed control: effects on protection, survival and growth of cherry bark oak seedlings planted on a cutover site**. New Forests, 2000, 20(2), 105-118.
37. Unknown. **Tree planting and aftercare**, www.btcv.org/skills/tree_planting/tp7.html
38. J. Evans, C.W. Shanks, **Treeshelters**, Arboriculture research notes 63/87/SILS
39. Dupraz C., Bergez J.E., **Amelioration de protections individuelles d'arbres à effet de serre**. Patent 9204295.1, February 1992
40. Dupraz C. et alii, **Broadleaved tree plantations on pastures: the treeshelter issue**. Proceedings of the 4th International Symposium on windbreaks and Agroforestry Viborg, Denmark, 106-111
41. Balandier P., Guitton J.L., Rapey H. **Amelioration des tubes-abris protégeant les jeunes arbres contre les animaux**. Ingenieries – EAT – No 4, 41-28.

Bibliography

42. Philippe Van Lerberghe, Pascal Balleux, "**Afforesting agricultural land**", 2001, Institut pour le Developement Forestier, ISBN 2-904740-80-5.
43. Philippe Van Lerberghe, **La plantation des plantations contre les dégâts de chevreuils**, 1999.
44. Philippe Van Lerberghe, **La plantation des plantations contre les dégâts de chevreuils**, IDF, CRPF, L'echo des forets, 13 Juin 2000.
45. Philippe Van Lerberghe **Bien poser les protections contre le gibier**, IDF.
46. Pierre Gonin, Philippe Van Lerberghe, Antoine Delarue, **Protéger les plantations contre les dégâts de chevreuils**, Forêt- entreprise n° 138, 2001,16-20.