

BB2330 Plant Biotechnology



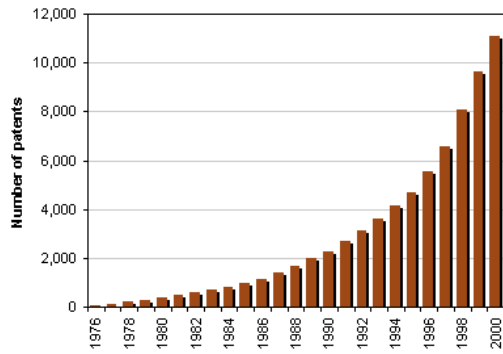
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Plant Biotechnology represents an expansive industry ...

Number of plant biotech patents granted in USA



Note. Data from USDA-ERS (2004).

Monsanto stock 2000-2013



... which may provide solutions to our problems of food, materials, energy and climate change ...



We discuss advances and potentials, but also the criticism and controversy.
Who is using plant biotech, for what, and what is all the fuss about?



GM soya, Pampas



The GMO-controversy, USA



Eucalyptus plantation, South Africa

But first, the hard-core science: what is a plant, how do they "work" ...

Topics of plant biology:

- Plant development and life cycle
- Plant cell and cell wall
- Signaling and transcription
- Plant hormones
- Tolerance to stress: adverse environment and pathogens



... and how can we make them work
for us?

Topics of plant biotechnology:

- Plant tissue culture
- Plant transformation techniques
- Forest biotechnology
- Functional foods
- Phytoremediation
- Plant-made pharmaceuticals
- Biofuels

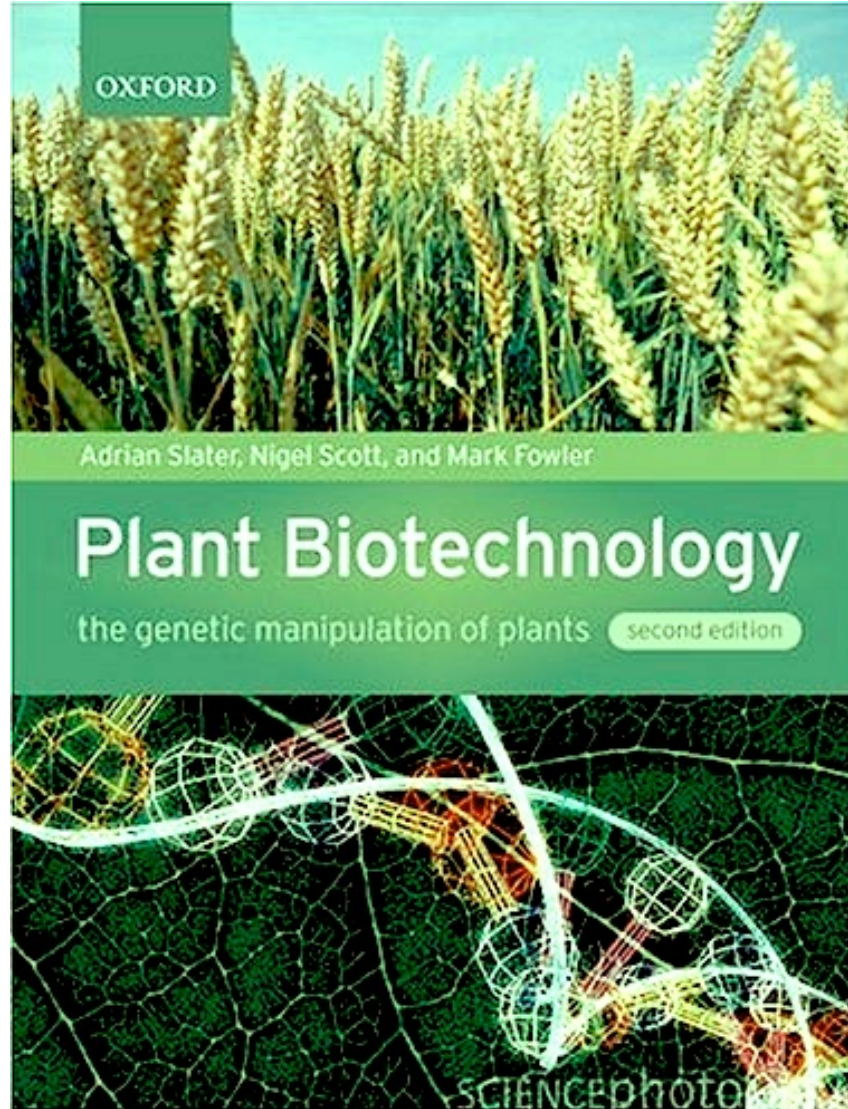


Course laboratory exercise

- Hands-on genetic manipulation av plants
- Transient expression of enzymes in leaves
- In vivo studies of transcription factor transactivation through specific cis-elements



Course textbook



(2008 Edition)

Date	Time	Lecture/Lab	Teacher	Room
Wed 18/1	15-17	L1: Introduction; Plant anatomy, development and life cycle	IE	FB51
Thu 19/1	15-17	L2: Plant cell: organelles, signaling and gene regulation, Ch 1, Ch 14/PP & Ch 18/BMBP (pdf)	IE	FB51
Wed 25/1	13-15	L3: Plant cell wall, Ch 2/BMBP (pdf)	IE	FB51
Thu 26/1	13-15	L4: Plant hormones	IE	FD41
Tue 31/1	8-10	L5: Plant tissue culture, Ch 2. Transformation of plants or plant cells, Ch 3 & 4	IE	FD41
Wed 1/2	8-10	L6: Stress and pathogen tolerance, Ch 6, 7, 8 & 9	IE	FB51
Thu 2/2	8-10	Lab 1: Introduction & Virtual Transformation of Agrobacterium	IE, FL	FB51
Tue 7/2	8-10	L7: Model plants. Herbicide tolerance, Ch 5. Improved nutritional content and functional foods, Ch 10	IE	FB51
Wed 8/2	8-10	L8: Phytoremediation. GMO controversy and regulations, Ch 12 & 13	IE	FB51
Thu 9/2	16-18	Lab 2: Agro-infiltration	FL	FD44
Mon 13/2	15-17	L9: Marie Nyman, Swedish Gene Technology Advisory Board, Gentekniknämnden	IE	M37
Tue 14/2	8-10	L10: Forest biotechnology	HA	FB51
Wed 15/2	8-10	Lab 3: Measure enzyme activity	FL	FD44
Mon 20/2	8-10	L11: Plants as green factories: production of plastics, fats/oils, fibers, proteins and biofuels, Ch 11	IE	M37
Wed 22/2	8-10	Lab 4: Data analysis	FL	FB51
Fri 24/2	15-17	L12: Group Discussion	IE, FL	FB51
Tue 28/2	10-12	L13: Case studies	IE	FB51
Wed 29/2	10-12	Lab 6: Discussion	IE, FL	FD51
Thu 1/3	10-12	L14: Case studies	IE	FD51
Fri 9/3	13-15	L12: Highlights and wrap-up	IE	FB51
Thu 15/3	14-18	EXAM		FB54

Teachers:

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