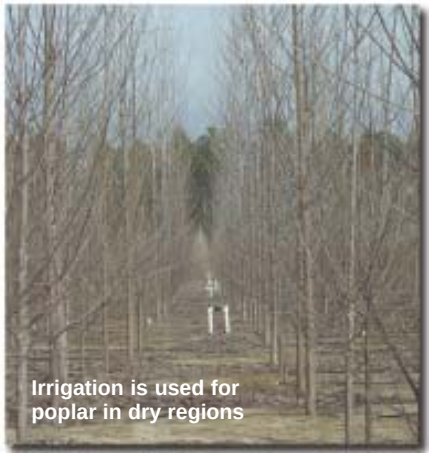
RESEARCH AND FUTURE APPLICATIONS

- Selection and production of improved planting varieties.
- Biological understanding of growth and productivity controls.
- Exploring phytoremediation potential.
- Improving operational efficiency and expanding potential new products.
- Understanding carbon sequestration potential.
- Developing integrated SRWC management systems.

HOW TO GET INVOLVED

- Join the Short Rotation Woody Crop Operations Working Group.
- Landowners seeking alternative crops can establish SRWC crops to obtain financial and environmental benefits.
- Researchers with forestry, agricultural, engineering or environmental cleanup interests should consider how cropping systems can be improved to achieve practical objectives



Irrigation is used for poplar in dry regions

CONTACTS FOR MORE INFORMATION

Short Rotation Woody Crops Operations Working Group
http://www.woodycrops.org

USDA Forest Service, Short Rotation Woody Crops Cooperative Research Program
http://www.srs.fs.fed.us/srwc

International Energy Agency Bioenergy Tasks:
http://www.shortrotationcrops.com

Short Rotation Woody Crops Program, SUNY College of Environmental Science and Forestry:
http://www.esf.edu/willow/

Agricultural Utilization Research Institute, Growing hybrid poplar as a crop
http://www.auri.org/poplars/poplars.htm

Potlatch Hybrid Poplar Project
http://www.potlatchcorp.com/envrnmnt/hybrid.asp

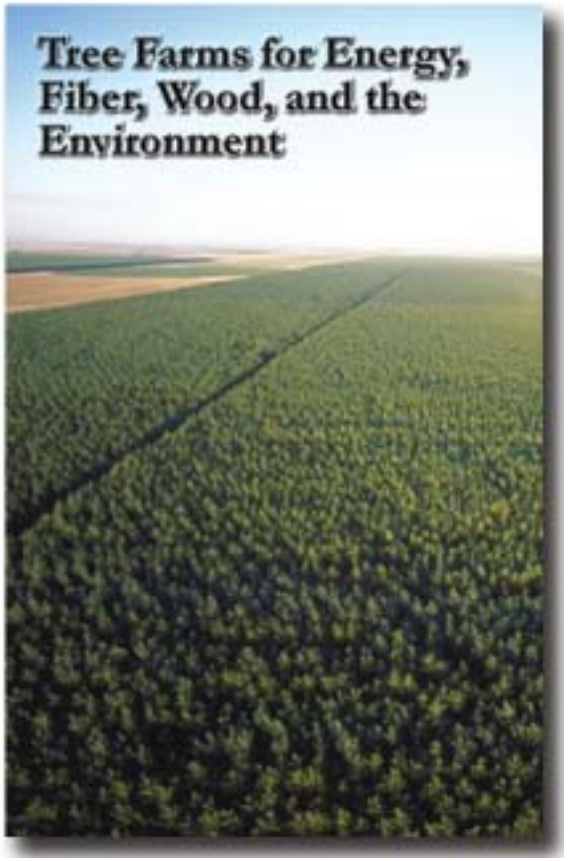
The Bugwood Network, Intensive management
http://www.bugwood.org/intensive

IUFRO Unit 1.09.00, Short Rotation Forestry For Biomass Production
http://www.ersac.umn.edu/iufro/iufronet/d1/hp10900.htm

Also contact your county extension agent and local land-grant institution.

James P. Shepard, Ph.D.
National Council for Air and Stream Improvement
402 SW 140th Terrace • Newberry, FL 32669-3000
(352) 331-1745 X227
jshepard@src-ncasi.org
www.ncasi.org

SHORT ROTATION WOODY CROP OPERATIONS WORKING GROUP



WHAT ARE SHORT ROTATION WOODY CROPS?

SRWC INVOLVES GROWING TREES AS AGRICULTURAL CROPS:

- SRWC are capable of producing from 8 to 20 tonnne/ha (4-10 ton/acre) annually with harvests at 3 to 15 year frequencies.
- Crops include poplars and willows in colder climates and cottonwood, sycamore, sweetgum and pine in warmer climates.
- Currently there are over 60,000 ha (150,000 acres) growing on industrial forest and private agricultural lands throughout the United States.
- Non-irrigated systems are used in humid regions of the Northeastern and Southern US and costal Pacific Northwest, irrigation is used in dryer regions of inland Pacific Northwest, and coppice culture is used in the Northeastern US where frequent harvests occur in closely-spaced tree rows.
- SRWC use both agriculture and forestry technologies: Conventional tilling, fertilization and competition control are employed to initiate the crop. Harvesting is accomplished using forestry fellers and forwarding equipment in large diameter stands. Small diameter willow use modified combine, cane harvesters, or specialized equipment.
- Extensive breeding programs are selecting fast growing, disease resistant varieties.

Tree farming using agricultural equipment

HISTORY OF SRWC

- 1960s — Concern over wood fiber availability and cost. Forest Service identified fast-growing tree species and developed production techniques in both north central and southern US.
- 1970s — The 1973 Oil Embargo impelled woody crops as alternative energy source. DOE initiated Woody Biomass Fuels program. Industrial cottonwood plantations started in Mississippi.
- 1980s — Operational plantings occurred in Lake States and PNW. Genetic selection and breeding was a focus.
- 1990s — Commercial plantings and breeding efforts initiated in PNW and lake states. Extension programs and government incentives encouraged SRWC. Phytoremediation potential of cottonwoods discovered.

SHORT ROTATION WOODY CROPS
OPERATIONS WORKING GROUP

PRODUCTS AND BENEFITS

Products Include:

- Bioenergy feedstock
- Pulp and paper
- Solid wood products

Economic Benefits:

- Provide farmers with alternative crop
- Enhance rural economies
- Decrease reliance on fossil fuel and enhance U.S. energy security.
- Enhance wood supply security.

Environmental Benefits:

- Sequesters atmospheric carbon, and offsets fossil fuel emissions.
- Reduces production pressure on natural forests.
- Improves wildlife habitat by creating varied structure in farm landscapes
- Reduces chemical application on agricultural lands compared with annual row-crop agriculture.
- Improves soil, air, and water quality by stabilizing soil, enriching soil quality through carbon additions, and filtering air and water
- Stream protection, effluent filtration, and remediation of contaminated sites.

Willow Coppice Culture in Northern US