S. triandra x S. viminalis

(S. x mollissima)

INTRODUCTION

It is a vigorus variety of basket willow.

Photo: www.mammothwillow.co.uk

GENERAL INFORMATION

Scientific name: *S. x mollissima*
Family: *Salicacae*

Parental species: Almond Willow (*XXS. triandra*) and Osier (*XXS. viminalis*).
Common name: Sharp-stipuled willow

DESCRIPTION

Height: it is not quite as tall as some of the other willows, with a height 1.7m
Growth rate: very fast growing

USE AND MANAGEMENT

Used for firewood or biomass production (S.R. coppice)
It has flexible stems making good for living structures, fedges and sculpture.
Used also for basketry coarse and as windbreak

PESTS AND DISEASES

It has shown good resistance to disease.

USE IN PHYTOREMEDIATION

----------Experiment 1----------

Contaminants of concern	Cr, Ni, Cu, Zn, Cd, Pb.
Plant species	*S. triandra x S. Viminalis* (clone Q83)
Interaction of plant and contaminants: Tolerant plant (enhancement of microbial community) / phytoremediation	Phytoremediation
Mechanism involved: Phytostabilisation/rhizodegradation/phytoaccumulation/phytodegradation/phytovolatilization/ evapotraspiration	Phytoaccumulation
Types of microorganisms associated with the plant	Not reported in the publication.

Laboratory/field experiment	Laboratory experiment (hydroponics)
Initial contaminant concentration	The metalamended solutions contained a metal cocktail of 200mMZn and 10 mMCd,Cu,Ni, Pb and Cr.
Length of Experiment	6 weeks
Post-experiment contaminant content	After six weeks there were large increases in the concentrations of Cu, Pb and Cr in the leaf tissue of 'Q83', but not in the other willow clone tested (Germany), treated with the metal cocktail in 1/16 strength Hoaglands solution. The total amount of Ni taken up was considerably less than for other metals. Heavy metal oncentrations were generally greater in clone 'Q83' than in 'Germany', but the biomass suffered as a result of this. Nevertheless total weight of metal taken up for this treatment was much greater in clone 'Germany' than 'Q83', as biomass of 'Germany' samples continued to rise throughout the six weeks of the experiment, whereas those of 'Q83' plateaued after two to four weeks.
Post-experiment plant condition	Shoot length and leaf and root biomass of clone 'Germany' samples continued to rise throughout the six weeks of the experiment in the 1/4CM treatment, whereas those of clone 'Q83' plateaued after two to four weeks.
Solution characteristics	Trees were grown hydroponically in a flowing culture system and exposed to one of four solutions: control (1/4 strength Hoaglands solution (Hoagland and Arnon, 1941)) or a metal cocktail in one of three different strengths of background solution (1/4, 1/8 or 1/16 strength Hoaglands solution). All solutions were adjusted to pH 5.5.
Age of plant at 1st exposure (seed, post-germination, mature)	1 week
Requirements for phytoremediation (specific nutrients, addition of oxygen)	No requirements.
Contaminant storage sites in the plant (root, shoot, leaves, no storage)	An increase in the ratio of metals in leaves:roots was observed; it may indicate a breakdown in the root sequestration mechanism for these metals. The ratio of metals taken up into the leaves compared with the roots was highest for Zn and Cd, which are easily translocatable metals, and lowest for the poorly translocatable Pb, Cr and Cu.

Reference

C. Watson, I.D. Pulford, D. Riddell-Black, 1999. Heavy metal toxicity responses of twowillow (*salix*) varieties grown hydroponically: development of a tolerance screening test. *Environmental Geochemistry and Health* 21: 359–364.