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QUANTITATIVE CHARACTERS VARIABILITY AND DISEASES/PESTS TOLERANCE OF SOME OF *Salix* SP. ACCESSIONS

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Abstract

The oil crisis of the last decades of the twentieth century has led researchers to turn their attention to alternative sources of energy, the so-called green energy. One of the genres intensively studied for biomass production was the genus *Salix*. In Europe, in Sweden, were made the first *Salix* hybrids for short-rotation crops (SRC). Willows are used for wood plantation, cellulose and paper production, in pharmaceutical industry, for soil phytoremediation, like pioneer species by their role in ecosystem restoration, increasing biodiversity and for biomass production (Berg, 2002).

In Romania, willow SRC for biomass production started after 2005. There are about 1500 ha of willow SRC, 400 ha of them are in Banat area. All of these cultures were established with Swedish clones, especially clone Inger. Swedish clones and hybrids registered good results in Sweden and North-West Europe countries with cool, wet climate, but in Romania they have not achieved spectacular results in some areas, such as North-Est Timis county and Oltenia area, the crops being compromised in the first years. In the view of the extension of cultivated areas unsuitable for agriculture, with forestry and energy crops, there are necessary comprehensive studies to find optimal solutions - selection of genotypes to their potential production, but also to be adapted at temperatures over 35°C and severe drought. A willow breeding program for the biomass production has to be started and a potential genitors collection (local germplasm) sets the stage for the beginning of a science-based breeding program.

The collection of potential genitors (39 genotypes, 12 species) was established in the spring of 2015 on the territory of the Experimental Didactical Station belonging to Banat's University of Agricultural Sciences and Veterinary Medicine from Timisoara. The biological material (46 cuttings for each genotype) was planted in double rows 75 cm apart with double rows spaced at 150 cm and an 80 cm in-row spacing. During the growing season was made chemical and mechanical weed control. There were not applied phytosanitary treatments, in order to test the natural resistance of the genotypes. The sprouting capacity and biometric observations were made in an experimental trial with uncut and cutback shoots and biomass was estimated.

Following the biometric observations performed biannually and the evaluation of tolerance / resistance to diseases and pests, a wide variability was noticed, both interspecific and intraspecific. The quantitative traits varied significantly with genotype and management practice. Large variability was observed in terms of survival rate but also in sprouting capacity, maximum height, and diameter. The field trial recommends some genotypes with particularly high production, clone 30 *Salix pentandra* L. and clone 31 *S. triandra* L. for crops with short rotation cycle, both in normal soil and climatic conditions and on degraded lands.

The most tolerant genotypes both to pests and diseases were belonging to *S. rosmarinifolia* and *S. pentandra*. The most sensitive species include genitors from *S. fragilis*, *S. alba* and *S. purpurea*. Tolerance to pests and diseases was dependent on species and origin.

Key words: *Salix* sp., accessions, variability, short- rotation coppice, resistance to pests and diseases