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The Giant Knotweed (Fallopia sachalinensis var. Igniscum) as a new plant resource for biomass production for bioenergy

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The cultivation of bioenergy crop for energetic biomass production and biogas will increase in the next decades in Europe and the world. In Germany maize is the most commonly used energy crops for biogas. To optimize the sustainability of bioenergy crop production new land management systems and crop species are needed. Herbaceous perennials have a great potential to fulfill this requirement.

A new species for bioenergy production is the Giant Knotweed or Sakhalin Knotweed (Fallopia sachalinensis F. Schmidt ex Maxim., Fam. Polygonaceae) The knotweed is originated from Sakhalin, Korea and Japan .The plant is characterized by a high annual biomass production and can reach heights up to 3-4 m. As a new bioenergy crop the new cultivars IGNISCUM Basic (R) and IGNISCUM Candy (R) were cultured from the wild form and commercially used. Important is that both cultivars are not invasive. IGNISCUM Basic is used for combined heat and power plants. IGNISCUM Candy can be harvested 2-3 times during the growing season and the green biomass can be used for biogas production. Comprehensive test series are carried out to analyze the biogas. First results from lab investigations and experiments in biogas plants show that fresh matter of IGNISCUM Candy can well substitute maize as substrate in biogas power plants. Yields per hectare and the amount of biogas per ton of organic dry matter can be considered as almost equal to maize. Concerning the wooden biomass of IGNISCUM Basic values of combustion can be compared with wood chips from forest trees.

For a sustainable and optimal production of biomass we develop cultivation technology for this species. Field experiments are arranged under different climatic and soil conditions across Germany from Schleswig-Holstein to southern Germany to investigate the plant growth and biomass production on the field scale. Physiological parameters are determined for the relations between growth stages, chlorophyll content, photosynthesis and plant nutrients status. Furthermore, in greenhouse experiments and in lysimeter we investigate (i) the water consumption; (ii) the interrelations between nutrient supply, biomass production, and transpiration; and (iii) the optimization of the biomass production.