

Optimizing Seeding Rate, Row Spacing, and Tillage to Grow Switchgrass (*Panicum virgatum*)

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Switchgrass (*Panicum virgatum* L.) is a native, warm season (NWS) perennial grass. Currently, most (NWS) grasses in Georgia have been planted for wildlife and conservation. However, high energy costs have increased interest in the use of switchgrass as a potential biomass energy crop. High productivity with relatively few inputs makes switchgrass a favorable choice for energy production (Wright, 1994). Much of the past research has focused on agronomic issues related to the forage production of switchgrass (eg., Sanderson et al., 1996; Parrish and Fike, 2005). Although many aspects of such work are relevant to biomass production, more research needs to target specific agronomic issues related to switchgrass for biomass production. Bioenergy production will require a feedstock that is inexpensive, productive, and persistent. In order for switchgrass for biomass to become economically sound, research will need to be done to reduce switchgrass establishment costs, formulate fertilization rates, and design cost-effective harvest methods. The objective of this research is to determine the effect of seeding rate and row spacing on the development of a switchgrass stand in no-till and conventional-till soils in the Piedmont and Coastal Plain regions of GA. The experimental design is a split-split plot with four replications within each year and location. Whole plot treatments are no-till and conventional-till treatments. Split plot treatments are two row spacings (38 cm and 76 cm). Sub plot treatments are four seeding rates (1.1, 2.2, 3.3, and 4.4 kg PLS ha⁻¹). The response variables measured at 3, 6, and 9 weeks after planting are plants m⁻², tillers plant⁻¹, and weed ratings. The response variables measured at harvest are weed mass m⁻², weed ratings, year one yield (Mg ha⁻¹), and tiller mass (g tiller⁻¹). The expected results are that no-till plots will require higher seeding rates when compared to conventional-till plots and that 38-cm rows will result in a better stand than 76-cm rows. Also, it is expected that the highest seeding rate of 4.4 kg ha⁻¹ will result in the best stand for both no-till and conventional till plots.

References

- Parrish, D.J., and J.H. Fike. 2005. The biology and agronomy of switchgrass for biofuels. *Crit. Rev. Plant Sci.* 24:423-459.
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- Wright, L.L. 1994. Production technology status of woody and herbaceous crops. *Biomass Bioenerg.* 6:191-209.