Anaerobic digestion potential of organic wastes from small farms

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Food waste and organic residues are generated in substantial quantities on small farms. These include weeds, row clearings, diseased plants, culled fruits and vegetables, animal manures, and processing and market wastes. Current disposal practices include composting, spreading on uncultivated land, or sending to landfills. Although small farms may gain some benefit from these current practices (i.e. use of compost on planting beds), the farms are losing a substantial opportunity to generate bioenergy from their organic wastes. By utilizing anaerobic digestion, small farms can generate methane-rich biogas for on-site use. These uses can include cooking, space or water heating, gas lighting, gas-powered refrigeration, or electricity production. Additionally, nutrients in the feedstocks are conserved in the effluent of the digester and converted into plant-available forms (i.e. ammoniacal nitrogen). Thus the effluent, known as biofertilizer, can be a valuable commodity to the small farm as an organic fertilizer. This project is a case study of a local, organic small farm called Crones' Cradle Conserve located in Citra, FL. A waste audit was conducted at the farm for three weeks during the summer season to determine the types and amounts of organic wastes produced on the farm. Samples from the audit were analyzed for moisture and organic content to estimate the methane potential if these wastes were anaerobically digested. Food waste from restaurants and schools in the surrounding community and glycerol and washwater from local biodiesel producers could also be brought onto the farm as additional feedstock for increased methane and biofertilizer production.