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SPRING HARVEST OF CORN STOVER

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ABSTRACT Corn stover is an abundant biomass generally left in the field after grain harvest. Part of the stover should remain in the field for soil organic matter renewal and erosion protection. However, soil-crop simulation models indicate that 50% of the stover could be removed sustainably. This represents about one million t dry matter (DM) of stover per year in the province of Quebec. Stover harvested in the fall is very wet, between 40 and 60% moisture on average, with some parts such as the bottom stalks as wet as 75% moisture. While there are applications for wet stover (as a ruminant feed after ammonia enrichment, as a feedstock for cellulosic ethanol), the currently available markets (animal bedding, combustion fuel) require a dry product. Preliminary measurements indicated that stover left in the field throughout the winter would become very dry and a substantial amount would still be harvestable in the springtime. Corn stover was harvested at two sites in spring 2009. Each site was subdivided into two parcels. The first parcel was cut and raked in fall 2008 (fall parcel). The second parcel was cut and raked in spring 2009. Fibre from both parcels was baled in spring 2009. At the first site, a large square baler was used in late April to produce bales measuring 0.8 m x 0.9 m x 1.8 m. On the second site a round baler was used in late May to produce bales of 1.2 m in width by 1.45 m in diameter (+/- 0.15 m). On the second site, a small square baler was also used to produce bales of 0.35 m x 0.45 m x 0.60 m (spring cutting only). With the large square baler, an average of 3.9 t DM/ha was harvested equally on the fall parcel and the spring parcel (48% recovered biomass based on stover yields measured in the previous fall at this site). Large square bales from the fall cutting were heavier and wetter (241 kg/bale; 218 kg DM/bale; 9.1% moisture) than large square bales from the spring cutting (197 kg/bale; 187 kg DM/bale; 5.2% moisture). With the large round baler, an average of 4.2 t DM/ha was harvested from the fall parcel (37% recovery) and 3.7 t DM/ha from the spring parcel (34% recovery). Round bales from the fall cutting were slightly heavier and especially wetter (200 kg/bale; 165 kg DM/bale; 17.8% moisture) than round bales from the spring cutting (191 kg/bale; 181 kg DM/bale; 5.3% moisture). The small square baler harvested only 2.2 t DM/ha (20% recovery), with very light bales (8.8 kg/bale; 8.4 kg DM/bale; 5.3% moisture). Large square bales were denser (150 kg DM/m³ from fall cutting; 128 kg DM/m³ from spring cutting) than large round bales (91 and 98 kg DM/m², respectively) and small square bales (87 kg DM/m³). The experiments showed that harvest of a very dry corn stover in the spring is feasible. Early

harvest (late April) appeared better than late harvest (late May) to collect more stover (48% recovery).

Keywords: Corn, Stover, Harvest, Dry.