**Materials and Methods**

No-till seed drill:

Hard red winter wheat was planted with a 2-meter 3P606 Great Plains no-till seed drill on 19 cm row spacing. This drill uses fluted coulters to open furrows and independent spring-loaded rubber wheels measuring 5 cm by 33cm to close the furrows. Winter wheat was planted in October at planting depths varying from 1.25 cm to 4 cm depending on soil moisture present. The drill is equipped with a dry fertilizer box capable of applying fertilizer subsurface ahead of the closing wheels.

Conventional till seed drill:

Hard red winter wheat was planted with a 3-meter AGCO, Kincaid 2010 conventional till drill on 15 cm row spacing. This conventional till drill uses straight opening disc wheels to create the seed furrow and closes them with independent spring-loaded rubber press wheels measuring 5 cm by 33 cm. Winter wheat was planted in October at planting depths varying from 1.25 cm to 4 cm depending on soil moisture present.