

小麦免耕播种机驱动链式防堵装置设计 Design of the Powered-chain Anti-blocking Mechanism for Wheat No-till Planter

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摘要: 针对我国华北一年两熟地区玉米秸秆覆盖量多, 小麦免耕播种易堵塞的问题, 提出了驱动拨指链抛茬和刀刀型开沟器切茬相结合的新型防堵原理, 设计了免耕播种机驱动链式防堵装置。通过分析防堵装置的运动过程, 确定了驱动链、拨指和刀刀型开沟器等关键部件的参数。田间试验表明, 驱动链式防堵装置能够有效解决秸秆堵塞问题, 保证小麦免耕播种机的通过性。由于及时清除刀刀型开沟器前方的玉米秸秆残茬, 开沟阻力降低了12.3%。相比条带旋耕式小麦播种机, 驱动链式小麦免耕播种机在保证种肥情况的同时, 土壤扰动量减少了66.4%, 油耗降低了8.07%, 较好地满足了当地的农艺要求。

This paper put forward the new anti-blocking principle combining residue-throwing by powered-chain finger and residue-cutting by knife type opener, and designed the powered chain anti-blocking mechanism for no-till planter according to the problem of residue blocking of no-till wheat planting in heavy corn residue cover fields in annual double cropping areas of North China plain. Furthermore, the key parameters for powered-chain, chain finger and knife type opener were determined based on the analyses of the movement of anti-blocking mechanism. The field experiment showed that the powered-chain anti-blocking mechanism could solve the residue blocking effectively, so as to ensure the passing of wheat no-till planter. Through real-time clearing of corn residues before the knife type opener, 12.3% of opening force was decreased. Compared with the strip roto-tilling wheat planter, the powered-chain wheat no-till planter could not only seed and fertilize at the suitable depths, but also decrease soil disturbance and fuel consumption by 66.4% and 8.07%, respectively, which indicates that this new planter can meet the requirements of agronomy in North China plain.

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