

Compare the Amount of Canola Losses in Harvest Time with Three Types of Head

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Abstract: Canola is an most important non-cereal plants for the production of the oil and has become the main oilseed crops in Iran for recently years. Losses of canola seeds which occur in each level of canola production, especially in harvesting level. The first objective of this research was compare of harvester head in Iran. In Harvesting time canola pods separated from center line and canola seeds fall on the ground. Rapeseed harvest was by three types of head (Ordinary head, Iranian head, Foreign (Austrian) head) losses of harvest by ordinary head was higher than other 195 to 254 (kg/h). Minimum losses occur in harvesting with Austrian head and losses by Iranian head was between two types of head. The vertical cutter bar have an decrease impact on canola losses this cutter bar has best Performance in Austrian head and reduce losses which occur in part three of head. Losses of canola seeds determine with Hobson trays.

Key words: Canola losses, harvest, heads, oilseed

INTRODUCTION

Canola and rapeseed are the common names to describe agricultural products including Species *Brassica napus* L., *Brassica rapa* L. (formerly *Brassica campestris* L.), *Brassica juncea* L. Czern (Bengtsson *et al.*, 1972). Canola is one of rape seed that include 33/56% of oilseed planting in Iran. Value of production in The World has provided the following Table 1 by (Mielke, 2002; gunstone *et al.*, 2004).

Canola has two pods at fully mature they separate from center line and seed losses occurs. (Brucel *et al.*, 2001). Environmental factors in the growth period is different, such as water stress and nutrient deficiency also Temperature reduces the maturity time to one-half (Weiss, 2000; Bedane *et al.*, 2006). There are different methods of canola harvesting Considering the pod characteristics of rapeseed (Davies and Bruce, 1997; Domeika *et al.*, 2008). Two methods for canola harvest is Direct harvesting and swath harvesting (Domeika *et al.*, 2008).The recommended method for canola harvesting in iran is direct harvesting. Neale (2001) has reported if increase the speed 4/5 to 6/4 (km/h) losses in separator part will be double. Price *et al.* (1996) Indicated a high product moisture causes the knocker should act with more power. The Best moisture of canola harvesting is from 5 to 6% of W.B. and the minimum losses in the platform occur in 5/5 (km/h) speed and the knocker speed around 900 rpm (Rahama *et al.*, 1997). In direct harvesting canola harvest performance reduce until 5-10% of seed (Lazarichieva,

1988; Price *et al.*, 1996; Spokas *et al.*, 2004) The objective of this study is to determine amount of losses in direct harvesting and Comparison of harvest with Various types of head.

MATERIALS AND METHODS

This study was conducted in North of Iran in spring of 2010. Our field located in Golestan province. Golestan is one of most important province in planning of Canola. In this study has been used a JD955 combine construction company building Iran since 1980 and Sahand combine and they included 92% of all combine in Iran. It has been used three types of heads to determine losses in direct harvesting:

- **Iranian head:** All part of the head same NO.1 but it has vertical cutter bar in both sides that work with mechanical power for harvesting rapeseed. This head only connection JD955 combine (Fig. 1).
- **Ordinary head:** It has been use for all crops and rape seed. This head needs to JD955 combine and it didn't have any especial instrument for rape seed harvest.
- **Foreign (Austrian) head:** Also this head has vertical cutter bar in both sides but they work with hydraulic-mechanical power. Austrian head needs Sahand combine for harvesting and use their cutter bar (Fig. 2).

Table 1: World totals (million tones) for production rapeseed from (2000 to 2003)

Year	2000/01	2001/02	2002/03	2003/04
Production	37/53	36/66	32.53	37/22
Harvest area	24.7	23.9	22.5	25
Yield	1.56	1.53	1.44	1.49



Fig. 1: JD955 combine with Iranian head



Fig. 2: Sahand combine with Austrian head

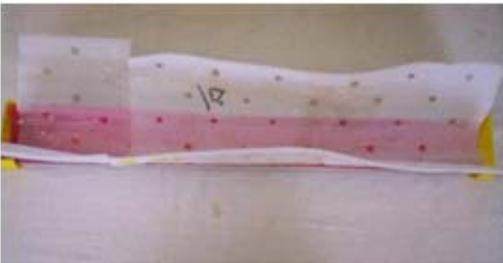


Fig. 3: Tray is used in determine canola seeds

In addition for find optimum combine speed between 2/5 and 3/2 (km/h), is used transmission in the gear system. Land intended to test is a one hectare. This farm is located in Golestan province in north of Iran. Canola seeds are very small and When seeds fall on the ground, so couldn't been found. Habson and Price method is used to Measured the losses of canola harvesting. In This method is used 12 trays with 64×7 (cm²) size. Hobson

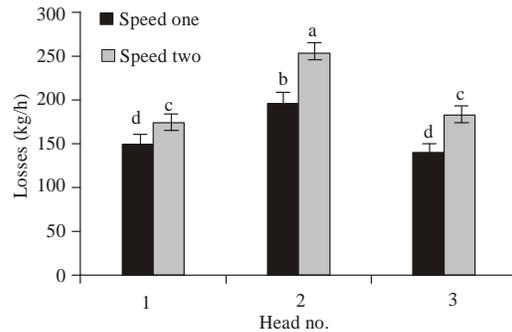


Fig. 4: Canola losses in three types of head

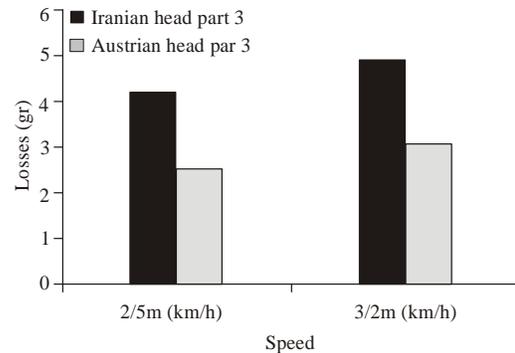


Fig. 5: Canola losses in part 3 of Iranian and Austrian head

arrangement of trays in three part behind combine head (Hobson and Bruce, (Fig. 3).

RESULTS

Seed loss results are reported in 21 kg/ha and each loss result from each head compare with other in two speeds (Fig. 4).

In this graph of Losses of canola between three heads, we can see that losses of canola went up in head NO.2 and in continue decreases canola losses in head NO.3. Results shows is used head NO.2 can Impacted on increasing losses but when heads NO. 1&3 were harvested Canola losses declined. Speed In each head impacted additive on losses. In losses of head NO. 3 due to the use vertical cutter bar losses has declined but vertical cutter bar in head NO.1 has less efficiency .Head NO. 2 haven't vertical cutter bar so losses of canola increased. Heads NO. 1&3 have vertical cutter bar that cause decrease losses of canola in behind part 3 of head (Fig. 5). According result of this study use heads with vertical bar is The most effective way to harvest Canola, But some heads with vertical bar has a lot of problem with Iranian combine. We consider Iranian combine have a lot of problem with new head and improve all harvest machine is very urgent.

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