Analysis of oil content in winter rapeseed (*Brassica rapa* L.)

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Abstract

The oil content of winter rapeseed was analyzed using Soxhlet extraction. The oil content of winter rapeseed was higher than spring rapeseed. The oil content of winter rapeseed was influenced by several factors such as altitude.

Key Words: winter rapeseed, spring rapeseed, oil content,variation

Introduction

Because the winter rape is self-compatible, drought-and cold resistant, long sowing time, early harvest, great productive potential and higher economic efficiency, the sowing area grows rapidly in Northwest, especially in Gansu province recent years. Oil content is the main concerned problem. We determined the oil content of *Winter Rape* varieties from different areas and expected to provide some scientific basis for the *Winter Rape* economic efficiency analysis and the variety breeding.

Materials and Method

The winter rape varieties of WYW-1, DQW-1, 9889, 9852, 02C za 9, Yanyou 2, MXW-1 and Tianyou 2 were collected from Wuwei, Zhangye and Jiuquan. The spring rape varities are mainly collected from Wuwei. Spring Rape sows in March, the Winter Rape sows in August.

Soxhlet extraction was used to determine the oil content. 2.5 grams of clean rape seed was weighed for each variety and dred at 80°C for 2 hours. The seeds were then put in a water extractor, ground into fine powder in mortar and packed with dry filters paper and dry at 105°C in the drying oven for 2 hours. Then the powder was taken out and weighed (A). Fill about 1 gram rape powder into a filter paper, and dry at 105°C in a oven for 3 hours, then take out and weigh (B). Fill the packages into the Soxhlet fat extractor and pour down ether till the ether completely soaks packages. After immersion in distilled water for at least 16h, heat up in water bath to auses the ether backflow. Control the backflow times in 8 times an hours, and generally extracts 6 to 8 hours. After extraction, takes out the package in to a ventilate place to let the ether volatize. Put the package in the drying oven at 105°C for 2 hours. Cool in the water extractor and weigh (C), the oil content (%) is calculated using equation (A-B)/(B-C).

Results and Analysis

Table 1 Oil contents of the winter and spring rape varieties

Varieties	number	Cultivars	Source	Oil content (%)	Average oil content (%)
Winter Rape	1	MXW-1	Wuwei	43.90	41.57
	2	MXW-1	Jiuquan	41.48	
	3	MXW-1	Zhangye	41.53	
	4	WYW-1	Zhangye	42.04	
	5	DQW-1	Zhangye	40.81	
	6	9889	Zhangye	40.35	
	7	9852	Zhangye	39.56	
	8	02C za 9	Zhangye	41.86	
	9	Yanyou number 2	Zhangye	42.28	
	10	Tianyou number 2	Zhangye	41.93	
Spring Rape	1	Wuwei small oil bud	Wuwei	37.00	39.67
	2	Wuwei small oil bud	Jiuquan	39.7	
	3	Wuwei small oil bud	Wuwei	41.02	
	4	Wuwei small oil bud	Wuwei	40.05	
	5	Wuwei small oil bud	Wuwei	40.60	
	6	Wuwei small oil bud	Zhangye	40.21	

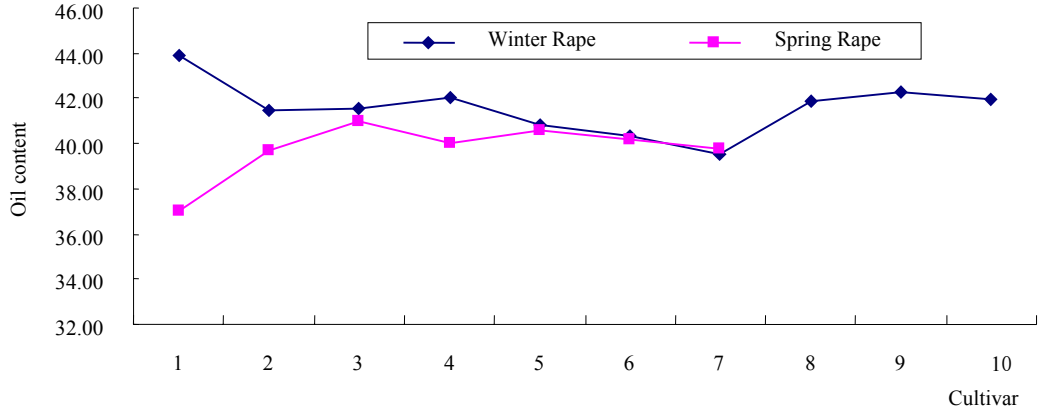

Figure 1. Oil contents of winter and spring rape cultivars

It can be seen from Table 1 that the average oil content of winter rape varieties' is higher than that of the spring rape (Figure 1). Oil contents of Winter Rapeseed and Spring Rapeseed from the same growing areas were compared and found that the Winter Rape varieties have higher oild content than the Spring Rapeseed varieties. The average oil content of Spring Rape grown in Wuwei is 37.00%, but is 43.90% in the Winter Rape varieties.

We compared the oil content of 8 Winter Rapeseeds sowing in Zhangye (Table 2). The Winter Rape cultivars average oil content is 41.05% (Table 2). The oil content ranges from 38.35% to 42.28%. Winter Rape varieties can be divided into two kinds according to oil content: oil content higher than 40.0% (WYW-1, DQW-1, 02C za 9, Yanyou 2, Tianyou 2r, MXW-1, 9889) and oil content lower 40.0% (9852).

Table 2 Oil contents of different Winter Rape cultivars

Winter Rape	Source	Oil content (%)
WYW-1	Zhangye	42.04
DQW-1	Zhangye	40.81
9889	Zhangye	40.35
9852	Zhangye	39.56
02C za 9	Zhangye	41.86
Yanyou number 2	Zhangye	42.28
Tianyou number 2	Zhangye	41.93
MXW-1	Zhangye	41.53

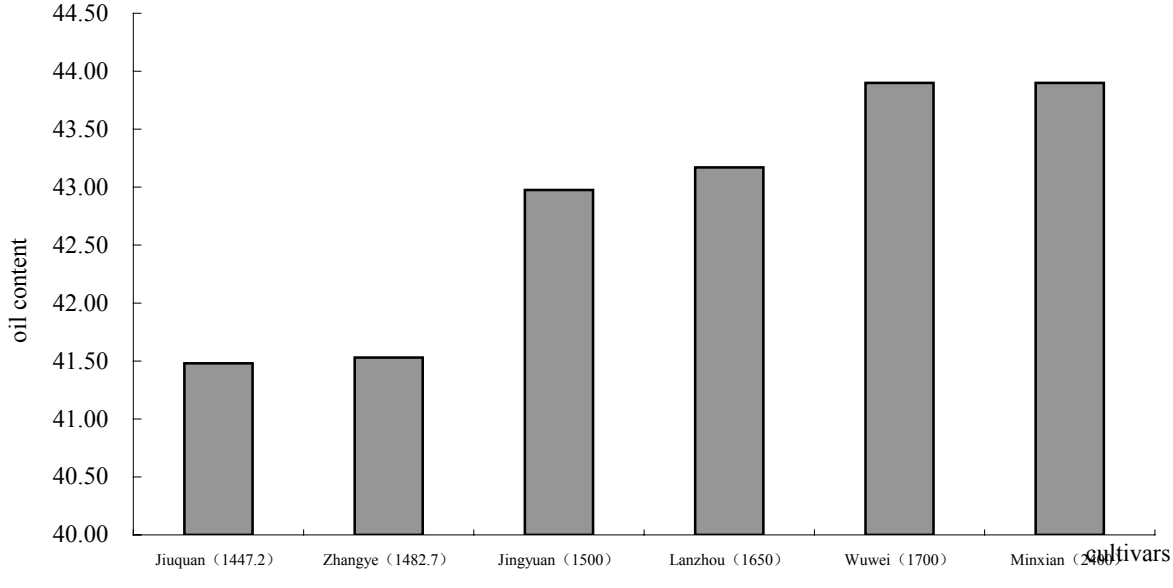

Figure 3 Influence of altitude on Winter Rape oil content

To test the relationship between oil content and the altitude, we grew the Winter Rapeseed variety MXW-1 at different

altitude (Figure 3). The oil content decreased as the altitude elevated.

Discussion

The results in this study indicated that the oil content of Winter Rapeseed was higher than Spring Rapeseed. The Winter Rape oil content is negatively influenced by altitude.

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