

# Application of “planting once and harvesting twice” technique in canola production

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## Abstract

Canola production pattern of “Planting Once and Harvesting Twice” (POHT) is to harvest both the bolt as vegetable at elongation stage and oilseed on ripening. In this study, investigation was carried out for the following factors: cultivars, sowing stage, appropriate bolt length for cutting, yield and profit. Results showed that it was suitable to pick 15- 20cm long stem when the peduncle is 25-30cm high for early-ripen cultivars sowing on Sept.5 in Hubei Province, harvesting 4500kg/ha fresh vegetable valued 4800 CNY and oilseed 2175kg/ha valued 5250 CNY, almost doubled the income of the conventional pattern. The plant height, primary branch and seed number per pod of the pattern were significantly less than that of the conventional by 16.47%, 63.49% and 5.33% respectively. However, the secondary branches and pods per plant were significantly more than that of the conventional by 126% and 7.90%. Maintaining a large number of pods is the key point of POHT to increase the oilseed yield.

**Key words:** double low, rapeseed, POHT

## Introduction

Double low rapeseed production pattern of “Planting Once and Harvesting Twice” (POHT) is a new practice in rapeseed cultivation. A study on the growth and development of rapeseed having removed part of the bolt, the proper length of the bolt to be cut, the profit of the production pattern was carried out in different counties of Hubei province.

## 1 Material and methods

Nine double low rapeseed varieties bred and cultivated in Hubei Province were used in the experiment to find the suitable varieties for the pattern, the best sowing date, the optimum density and the right length of bolt to be cut.

## 2 Results and analysis

2.1 The variety used in the pattern should be, firstly low content of erucic acid and glucosinolates, so that the peduncle will be tasted crisp and sweet, or it will be astringent and bitter; secondly prosperous vegetative growth with a high photosynthesis efficiency; thirdly the earlier bearing period to have a strong ability of bearing branches to produce more pods and seed.

Of the 9 varieties tested, 5 are hybrids, in which 4 of them yielded more bolt and seed than that of the conventional varieties, meaning that the hybrids had a vigorous growth in seedling stage, a strong ability to sprout early. Although the primary branches reduced, the secondary branches of the treatment with bolt cut remarkably increased resulting in the increase of total pods per plant.

2.2 The duration for bolt cutting would be from the end of November to the end of December, if sown on Aug.10, and transplanted on Sept. 22, and from the middle of December to the middle or late of January the next year, if sown on Aug. 20 and transplanted on Sept. 29, and from the early of Jan. to the late of February, if sown on Aug. 30 and transplanted on Oct. 11. Obviously, the quantity of the bolts picked decreased with the postponing of sowing date. However, aphids control and fertilizer applying should be paid attention to. If bolts-picking time is too early, the bolts will have a bad taste.

2.3 Planting density had positive relation to bolt quantity picked but negative related to seed yield. Therefore, a rational density could be obtained on considering the soil fertility, sowing date and farmer’s growing skills. In general, transplanting density should be relatively low in the fertile cotton and middle-season rice stubble field for  $9 \times 10^4$ - $10.5 \times 10^4$  plants/hm<sup>2</sup>; however, the density should be relatively higher in the poorer soil fertility field of late-rice stubble for  $10.5 \times 10^4$ - $12 \times 10^4$  plants/hm<sup>2</sup>.

2.4 Bolt yield had a negative correlation with seed yield in a certain degree. So, coordination of the two factors should be considered seriously to achieve a good profit. According to years experiment, picking 15-20cm long of the bolt when it is 25-30cm high would be suitable with a bolt yield of 4500-6000kg/hm<sup>2</sup> as vegetable, and without any seed yield difference.

2.5 Fertilization properly is critical for the technique application of POHT. In practice, fertilizer applying before transplanting is very important under the condition of medium level of soil fertility, with 900-1050kg/hm<sup>2</sup> of carbon ammonium, 600-750kg/hm<sup>2</sup> of superphosphate, 150kg/hm<sup>2</sup> of potassium chloride, and 15kg/hm<sup>2</sup> of boron applied to the field. Fertilizer should be applied also, 75-100kg/hm<sup>2</sup> of urine when the seedling coming back to regrow after transplanting, 45t/hm<sup>2</sup> of manure and 150kg/hm<sup>2</sup> of urine during winter time, and 75-100kg/hm<sup>2</sup> of urine at elongation stage and 5-7 days before bolt picking.

### 3. Questions and suggestions

A lot of work has been done on the technique of POHT and it becomes more and more popular in rapeseed production. However, unknowns are still to be studied: Firstly, how to insure the bolts get into the market at a large scale before Spring Festival in the triple-cropping system area? How to harmonize the contradiction between seedling raising and transplanting time, although sowing time could be slightly adjusted? Secondly, how to make the bolts taste better for the double low rapeseed through breeding and cultivation? Thirdly, if organic biological manure is effective or not for the improvement of bolt quality? Fourthly, how to raise yields of both bolt and seed? Fifthly, how to process and comprehensive utilize the bolt in large scale? And, how to control the disease after bolt picking?