

# Do Winter Canola Hybrids and Open-Pollinated Cultivars Require Different Seeding Rates?

A.M. Aubert, B.M. Showalter, K.L. Roozeboom, M.J. Stamm, G.L. Cramer

KANSAS STATE UNIVERSITY

Department of Agronomy

Department of Agronomy, Kansas State University, Manhattan, Kansas 66506

## Introduction

Winter canola (*Brassica napus* L.) is becoming a more important rotational crop in the southern Great Plains. Presently open-pollinated cultivars are more commonly grown in the region, but hybrid cultivars are becoming more popular each year. Hybrids have demonstrated greater yield potential in favorable growing seasons. The larger seed of hybrids lends itself well to seed singulation associated with plated planters. A common question is whether or how production practices should differ for hybrid vs. open-pollinated cultivars. For example, more costly seed and more vigorous seedling growth of hybrids have resulted in seeding rate recommendations that typically are less than those for open-pollinated cultivars.

## Objectives

1. Determine if hybrid (HYB) and open-pollinated (OP) winter canola cultivar yields respond differently to changes in seeding rate in wide (76 cm) and narrow (24 cm) row spacings.
2. Determine optimum seeding rates for hybrid and open-pollinated canola cultivars in both wide and narrow row spacings.

## Materials and Methods

- Two series of experiments located at Manhattan and Hutchinson, KS from 2015 through 2017
- RCBD, 4 replicates, split-plot or factorial treatment structure evaluating:
  - Cultivar type (2 OP and 2 HYB cultivars)
  - Seeding rate (5 rates)
- Four experiments planted in 76-cm rows with Monosem vacuum-plate seed meter
  - Seeding rates from 250,000 to 990,000 seeds ha<sup>-1</sup> in increments of 185,000 seeds ha<sup>-1</sup>
- Three experiments planted in 24-cm rows with volume-metered drill
  - Seeding rates from 370,000 to 1,050,000 seeds ha<sup>-1</sup> in increments of 185,000 seeds ha<sup>-1</sup>

## Results, 76-cm row spacing

- Cultivar type influenced response to seeding rate in only one of four experiments. In that experiment, hybrid cultivars yielded more than open-pollinated cultivars when seeded at 805,000 seeds ha<sup>-1</sup> (Figure 3).
- Seeding rates as low as 250,000 seeds ha<sup>-1</sup> supported yields from 900 to 2,000 kg ha<sup>-1</sup> (Figures 1, 2, and 3).
- Seeding rates of 435,000 seeds ha<sup>-1</sup> and greater supported yields from 2,400 to 2,700 kg ha<sup>-1</sup> (Figure 4).
- Hybrid cultivars yielded as much or more than open-pollinated cultivars in all experiments with 76-cm row spacing.

## Support

- This research was partially funded by USDA-NIFA Supplemental and Alternative Crops Program award no. 2015-38624-24333.

## Results, 76-cm row spacing

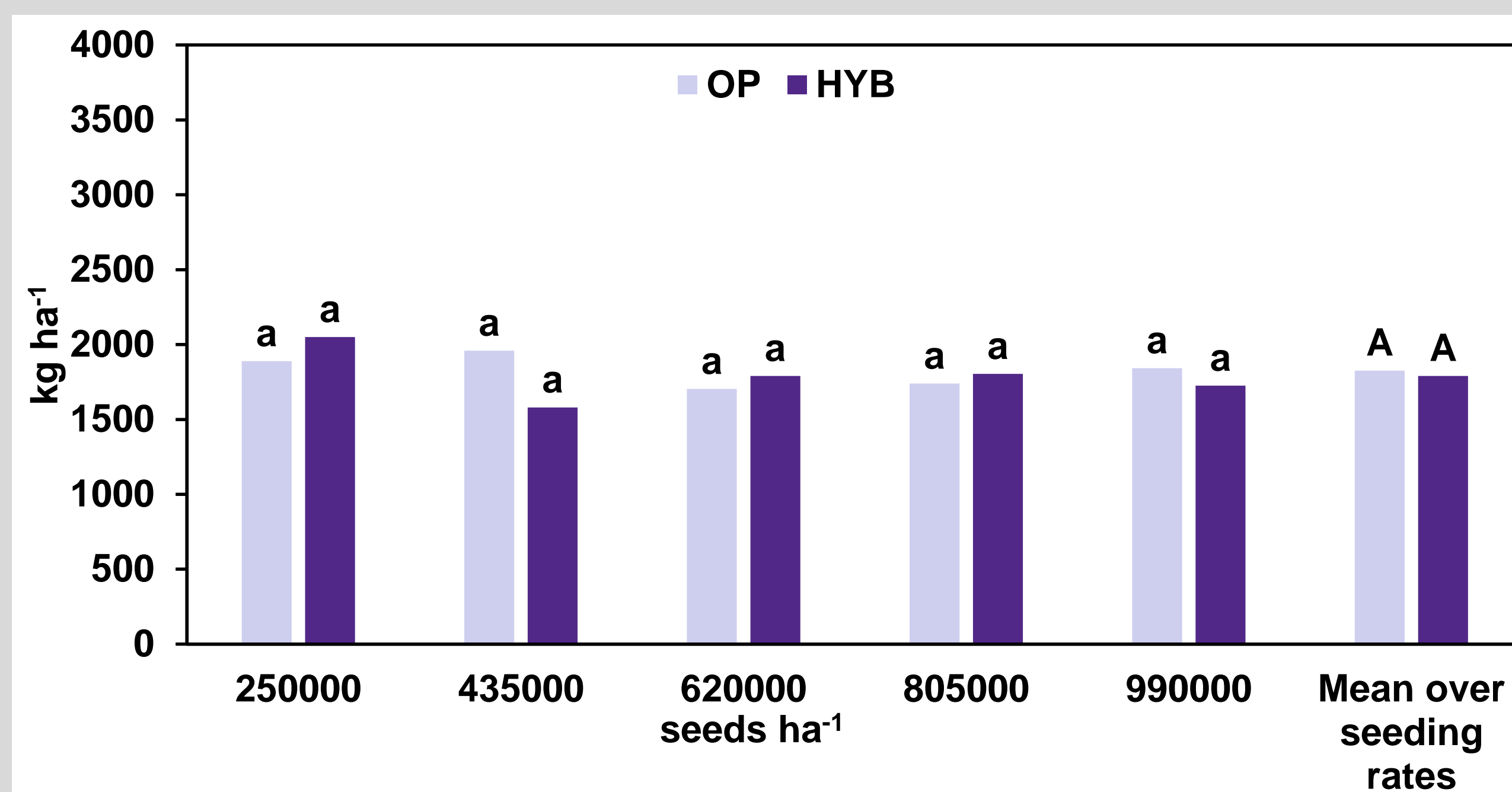


Figure 1. Canola yield response to seeding rate and cultivar type in 76-cm rows in tilled soil at Hutchinson, KS, 2015-16.

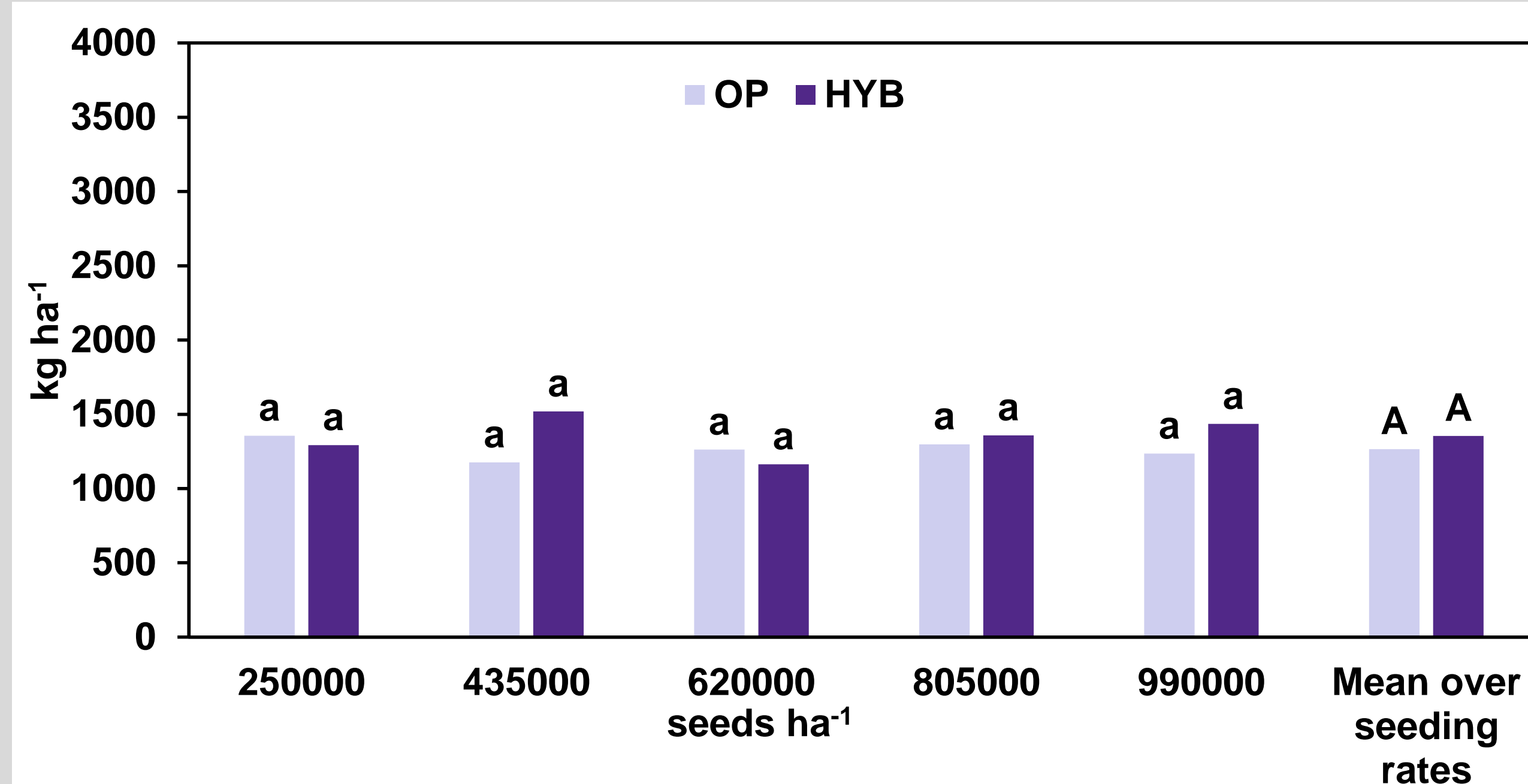


Figure 2. Canola seed yield response to seeding rate and cultivar type in 76-cm rows in untilled soil at Hutchinson, KS, 2015-16.

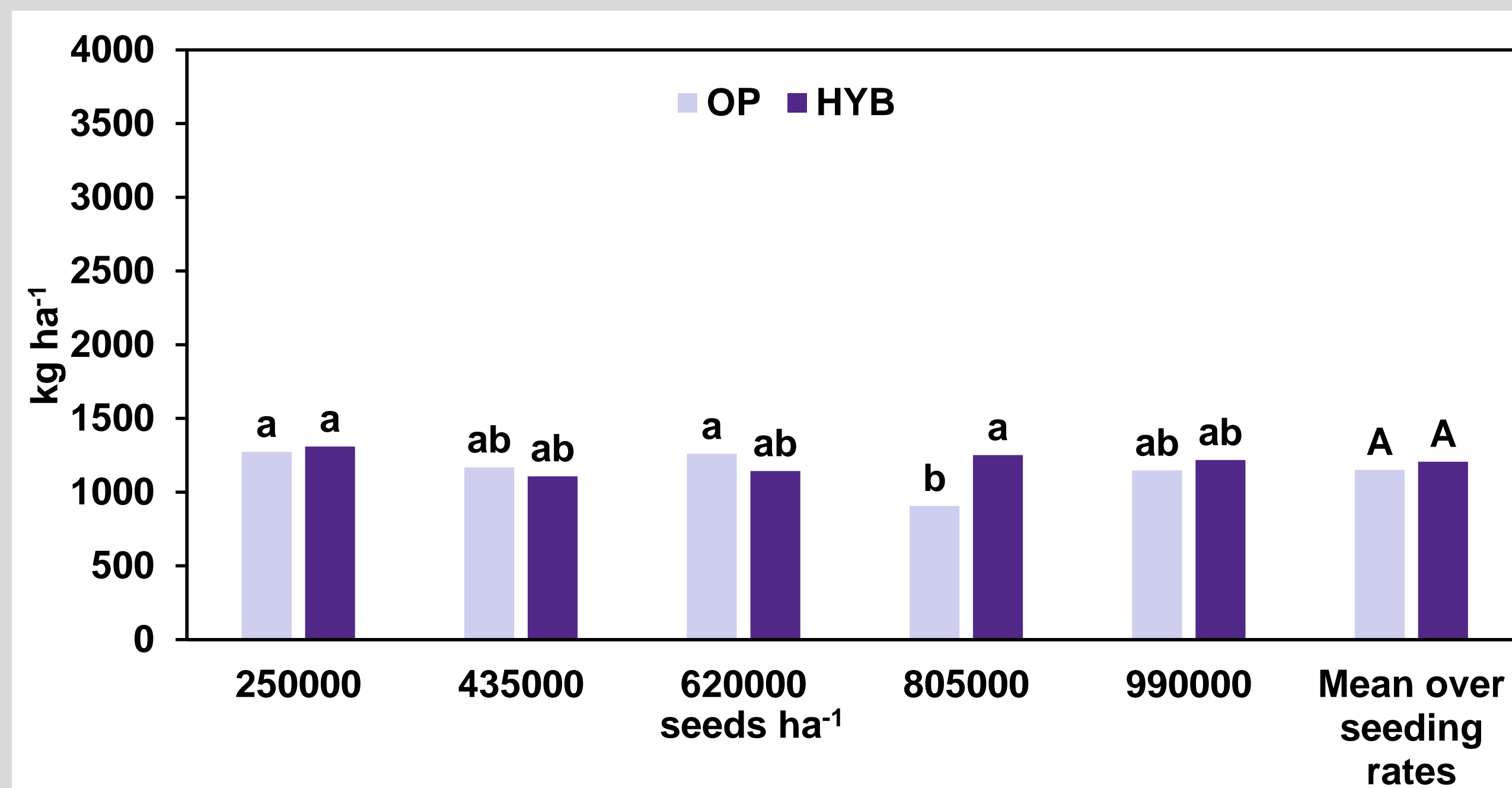


Figure 3. Canola seed yield response to seeding rate and cultivar type in 76-cm rows in untilled soil at Manhattan, KS, 2015-16.

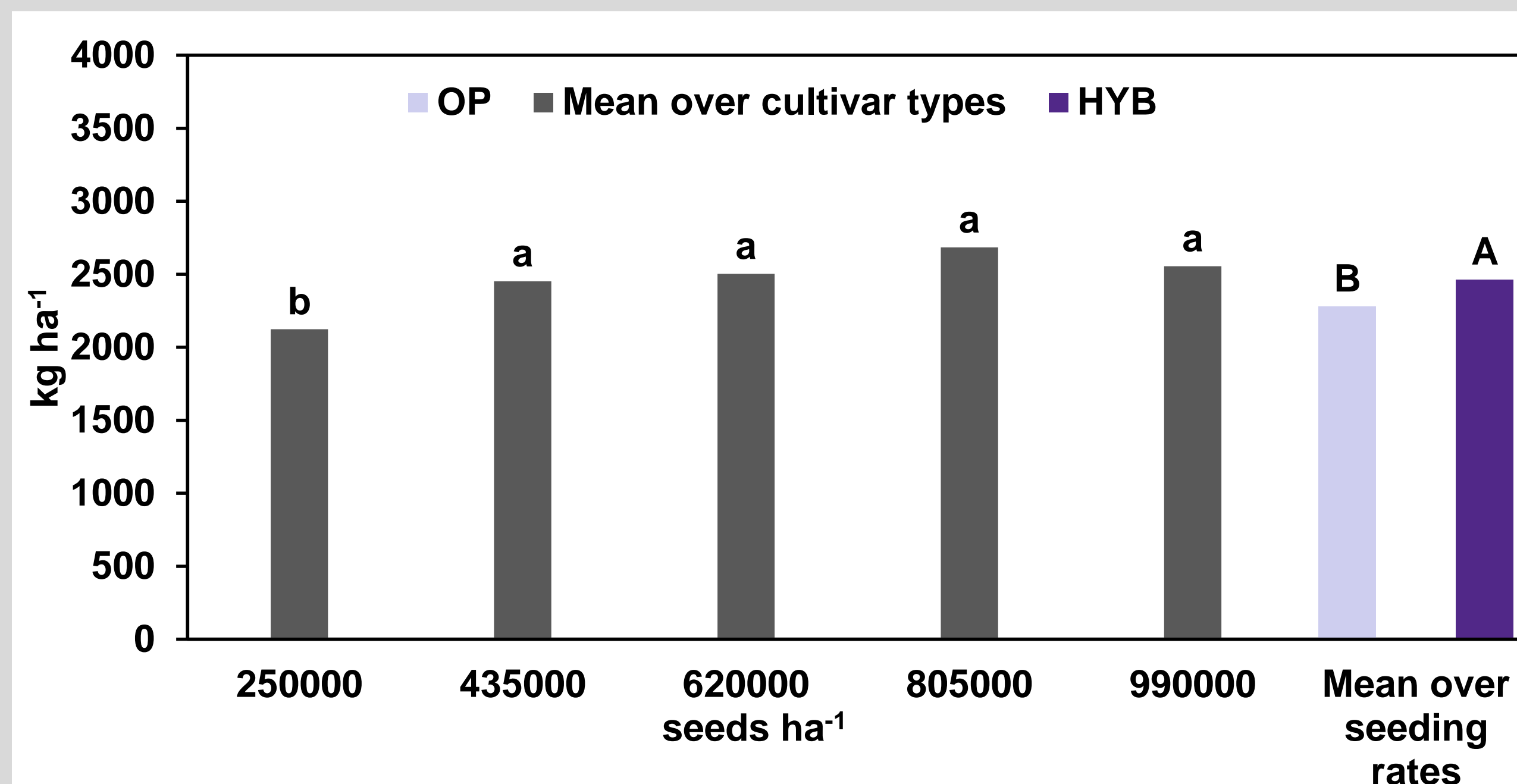


Figure 4. Canola seed yield response to seeding rate and cultivar type in 76-cm rows in tilled soil at Manhattan, KS, 2016-17.

## Results, 24-cm row spacing

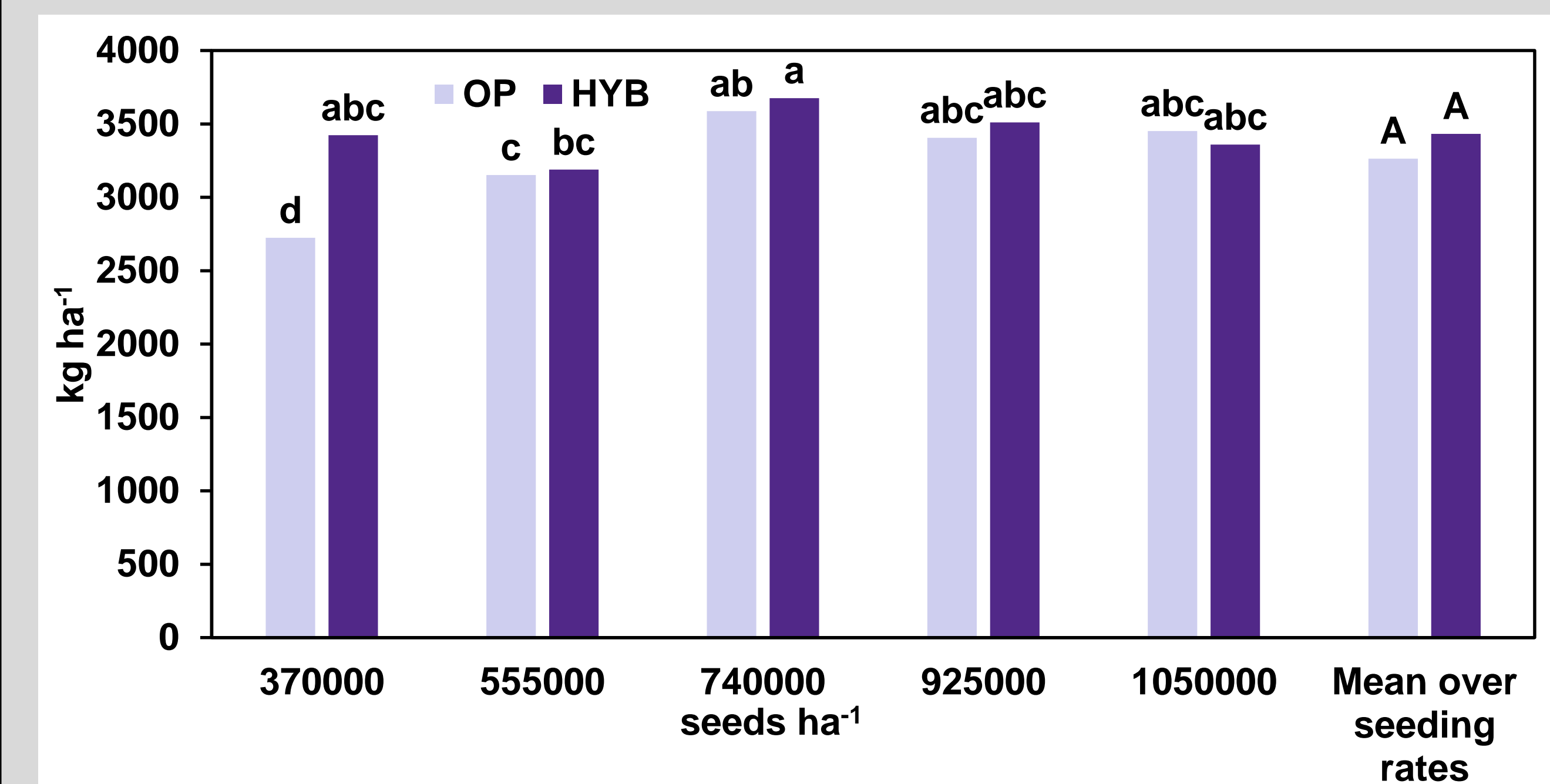


Figure 5. Canola seed yield response to seeding rate and cultivar type in 24-cm rows in tilled soil at Hutchinson, KS, 2015-16.

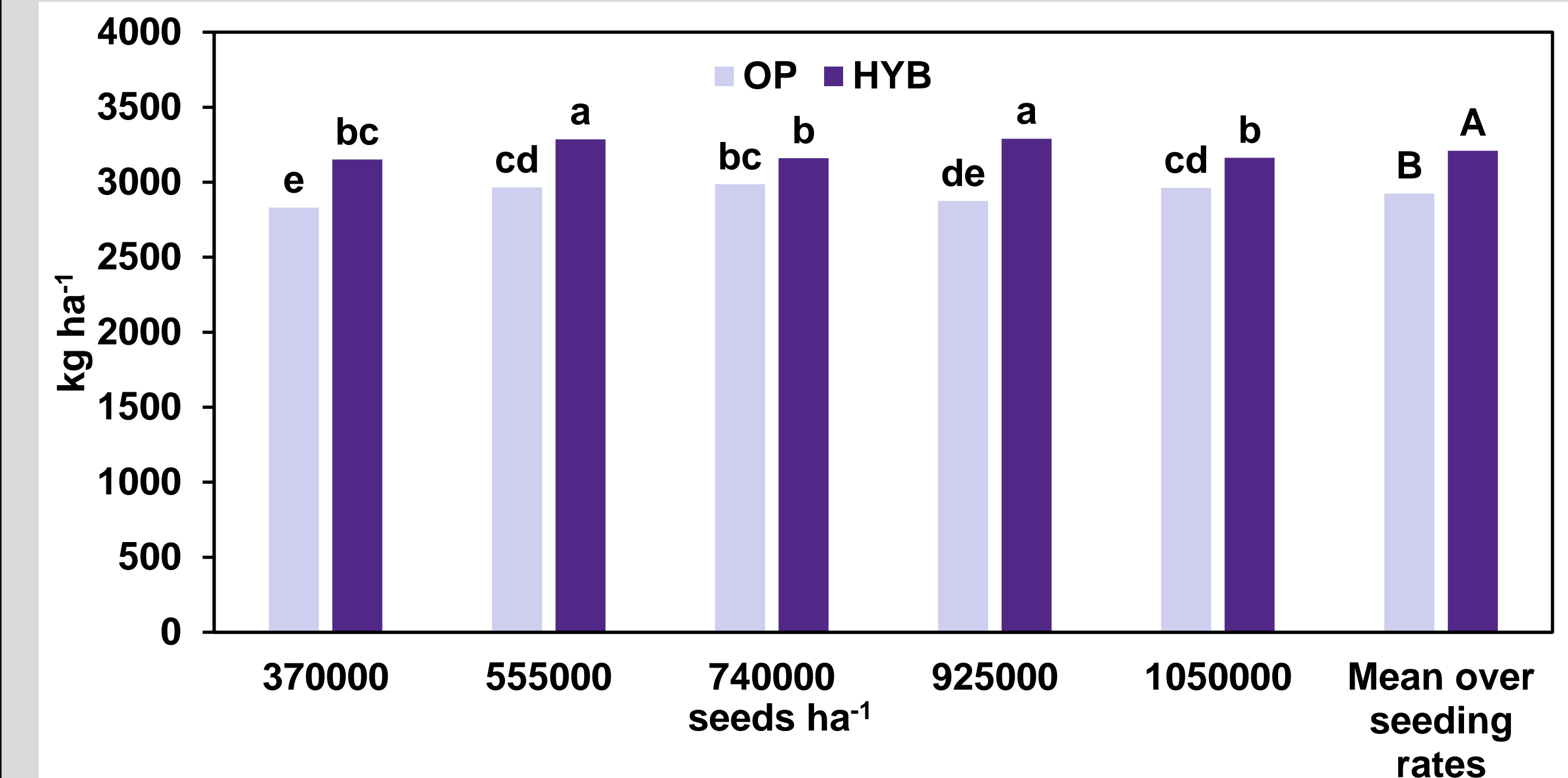


Figure 6. Canola seed yield response to seeding rate and cultivar type in 24-cm rows in tilled soil at Hutchinson, KS, 2016-17.

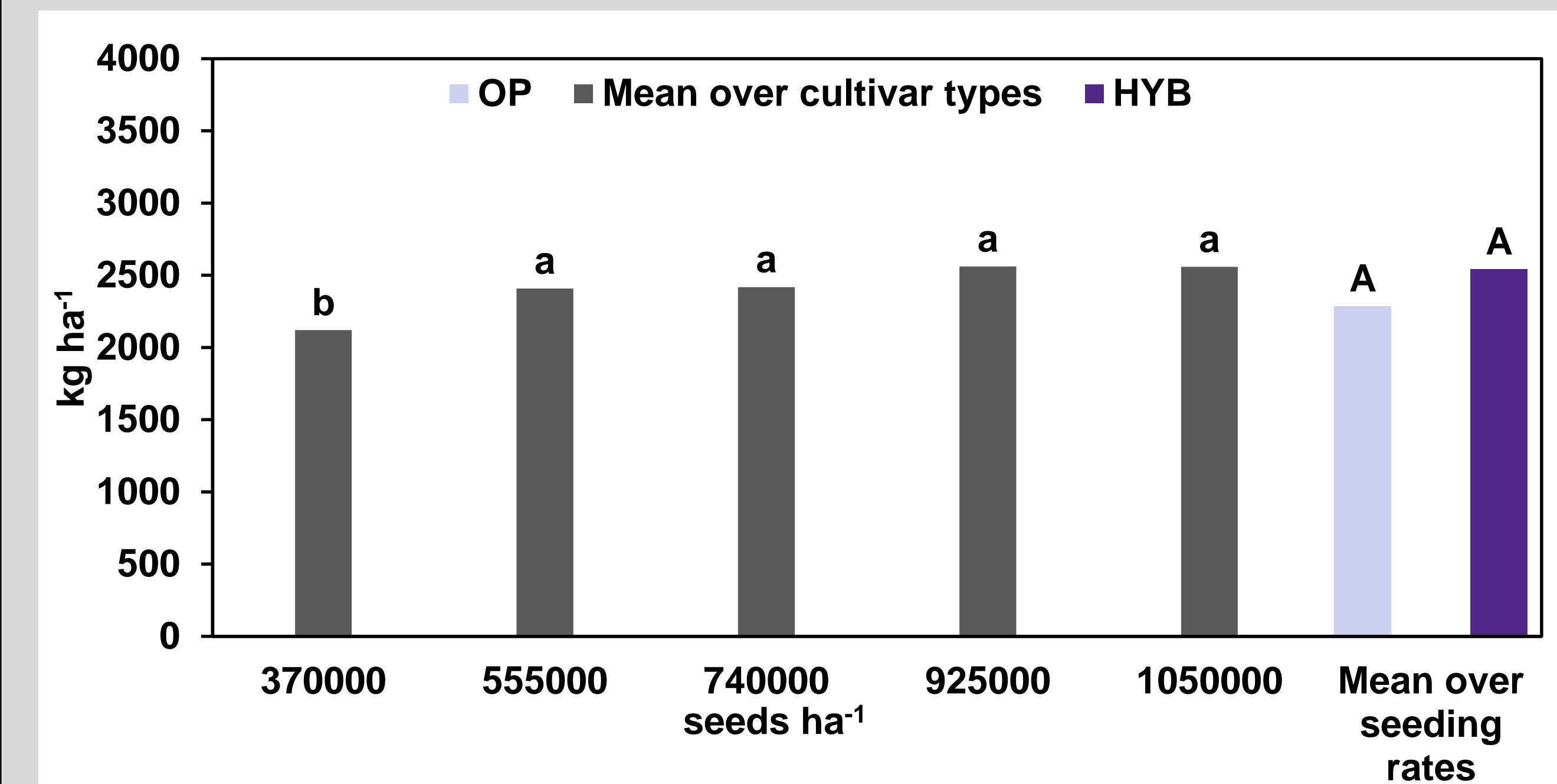


Figure 7. Canola seed yield response to seeding rate and cultivar type in 24-cm rows in tilled soil at Manhattan, KS, 2016-17.

- Hybrids maintained yields at lower seeding rates than OP cultivars in two experiments (Figures 5 and 6).
- Yields were maximized for both cultivar types at seeding rates of 555,000 to 740,000 seeds ha<sup>-1</sup> and greater.

## Conclusions

- Cultivar type (HYB vs. OP) had no consistent effect on yield response to seeding rate in either row spacing.
- Seeding rates of 250,000 seeds ha<sup>-1</sup> supported yields up to 2,000 kg ha<sup>-1</sup>, but 435,000 seeds ha<sup>-1</sup> were required to support yields surpassing 2,000 kg ha<sup>-1</sup> in 76-cm rows.
- Seeding rates of 555,000 to 740,000 seeds ha<sup>-1</sup> maximized yields in most instances in 24-cm rows.
- Future work will evaluate more cultivars of each type.