

Influence of row spacing and planting rate on weed control, ascochyta blight incidence, and economics of chickpea production (Large and small kabuli) (2004)

Objectives:

Determine the influence of row spacing and seeding rate on weed control; determine the level of weed control obtained from herbicides only, cultivation only, and a combination of herbicides and cultivation in large and small kabuli chickpea.

Determine the influence of row spacing, seeding rate, and fungicides on ascochyta incidence and yield in large and small kabuli chickpea.

Materials and Methods

Objective 1:

The study was conducted in 2003 and 2004 at Minot and Carrington, ND, in a randomized complete block design with four replications. Large kabuli ('Sierra') and small kabuli ('Amit') were evaluated both years. For the weed control study, both cultivars received at least two azoxystrobin applications to minimize ascochyta infection.

Chickpea weed control was evaluated using the standard narrow rows (7.5-inch) and seeding rate (140,000 seeds/A) compared to 30-inch rows, two lower seeding rates (70,000 and 35,000 seeds/A), and three weed control methods. The weed control methods included herbicide alone, cultivation alone, or a combination of herbicide and cultivation. A tank mix of ethalfluralin + sulfentrazone was applied preplant incorporated for the herbicide treatment in 2003 while pendimethalin + sulfentrazone was applied preemergence in 2004. A grass herbicide was applied postemergence to control grasses in all treatments requiring herbicides. Treatments requiring cultivation were cultivated one to two weeks apart after weed emergence. However, rainfall delayed cultivation in both years and allowed weeds to exceed the optimum size for cultivation.

Treatments were compared for percent weed control, yield, and test weight. Weed control was evaluated visually two times during the growing season.

Objective 2:

Ascochyta incidence was evaluated in large and small kabuli chickpea using standard narrow rows (7.5-inch) and seeding rate (140,000 seeds/A) compared to 30-inch rows, two lower seeding rates (70,000 and 35,000 seeds/A), and with/without a fungicide. Azoxystrobin was applied two times to treatments requiring a fungicide. Soil-applied herbicides were used to minimize the impact of weeds in the disease study.

Treatments were compared for ascochyta incidence, yield, and test weight. Treatments were evaluated two times for ascochyta incidence after flowering.

Results:

Disease control summary:

Large kabuli

Treatments with a fungicide application or treatments with higher initial plant densities generally had higher large kabuli yields. Regardless of whether a fungicide was applied or not, yields decreased as initial plant densities decreased.

At Minot, ascochyta ratings were significantly higher in the absence of a fungicide application. At Carrington, a fungicide application generally did not reduce ascochyta incidence compared to no fungicide.

At Minot, ascochyta ratings were generally similar regardless of row spacing and seeding rate. The presence/absence of a fungicide application was more important in determining the level of ascochyta incidence.

At Carrington, ascochyta incidence tended to be slightly lower in wide rows and lower seeding rates, but the lower crop densities also resulted in lower yields.

At Minot, treatments with a fungicide application yielded 400 to 1000-lb higher compared to no fungicide. At Carrington, yields were generally similar between fungicide vs. no fungicide, with 30 to 3000-lb yield difference.

Small kabuli

At Minot, in 2003, higher yields were not necessarily a function of higher initial plant densities and a fungicide application. In fact, treatments without a fungicide application generally did not differ in ascochyta rating or yield from treatments with a fungicide application. However, in 2004 yields were slightly higher with higher initial plant densities and fungicide application. Ascochyta incidence was higher in treatments with no fungicide application compared to the treated.

At Carrington, treatments with higher initial densities tended to have higher yields. A fungicide application did not reduce ascochyta incidence or increase yields compared to no fungicide. Ascochyta incidence tended to be slightly lower in wide rows and lower seeding rates, but was not significantly different.