SUMMARY

Two field experiments were conducted in the Experimental farm of Sakha Research Station, Kafr El-Sheikh during 1994/95 and 1995/96 winter seasons. The study aimed to investigate the effect of cultivars, seeding rates and weed control treatments on weeds, wheat growth and yield and its components. The investigation included three wheat cultivars, namely Sakha 8, Sakha 61 and Giza 163, three seeding rates of 40, 55 and 70 kg/fed. and three weed control treatments (Arelon at 1.25 L/fed., hand weeding twice and the untreated check).

The experimental design was split plot design with four replicates. The cultivars were arranged at random in main plots while seeding rates x weed control treatments were asigned at random in the sub-plots. Each sub-plot was 3.5 meters width and 4.5 meters length, wheat was sown as (Afir method) dry method and broadcasting.

Three samples were taken randomly for weeds at 60, 90 and 120 days after sowing while two samples were taken for wheat characters at 60 and 120 days from sowing and the data were recorded for weeds and wheat characters.

At maturity, ten spikes were taken at random from each plot, while the yield was determined from the encountered nine m^2. The data were recorded for yield, yield components and the biological yield of wheat.

Results could be summarized as follows:

a. A weeds:

I-Effect of seasons :

The seasonal effects were significant on the most of the studied characters for weed growth during the three sampling dates excluding the numbers of total weeds at 60 and 120 days after sowing.

5. With the exception of No. of grasses/m^2 at all sampling dates, No. of total annuals/m^2 at 120 days after sowing, fresh weight/m^2 of grasses at all sampling dates, fresh weight of total annuals at 120 days after sowing; dry weight of grasses at all sampling dates, dry weight of broad leaved and total weeds at the first sample, leaf area index for broad leaved weeds at the first sample and leaf area index for total annuals at the second sample, the interaction between seeding rate and season had non significant effects on all the rest measurements.

IV. Effect of weed control treatments :

1. Arelon application and hand weeding significantly reduced the number of grassy, broad leaved and total annual weeds at all sampling dates.
2. Fresh weights of grassy, broad leaved and total annual weeds were significantly reduced by controlling weeds using Arelon or hand weeding at the three dates of sampling.
3. Arelon and hand weeding treatments considerably decreased dry weights of grassy, broad leaved and total annual weeds compared to the unweeded check at all sampling dates.
4. Leaf area indexes for grassy, broad leaved and total weeds at 60 and 90 days after sowing were significantly reduced by Arelon and hand weeding treatments.
5. The weedy check plots recorded the highest values for all weed measurements during the three sampling dates.
6. The interaction between weed control treatments and seasons had significant effects on all studied characters for weeds with the exception of number of annual weeds at 60 days after sowing, number of broad leaved weeds at 120 days after sowing, fresh weight of total annuals at 90 and 120 days after sowing.

V. Effect of cultivar x seeding rate interaction :

1. Dry weight/m^2 of grassy weeds at 60 days after sowing and its fresh weight at 120 days after sowing were significantly affected by this interaction.
2. The highest values for dry and fresh weights of grassy weeds were recorded by seeding rate of 40 kg/fed. with Giza 163 cultivar while 70 kg seeds/fed. with Sakha 8 cultivar gave the lowest values in dry and fresh weights of grasses.
3. Sakha 8 cultivar significantly reduced leaf area index of grassy; broad leaved and total annual weeds with the highest seeding rate (70 kg/fed.)
4. The highest values of leaf area index of weeds were recorded by Giza 163 when seeded by 40 kg/fed.
5. The interaction of cultivar; seeding rate and season significantly affected all weed characters.

VI. Effect of cultivar x weed control interaction :

1. Number of grassy, broad leaved and total weeds recorded the lowest values under Arelon and hand weeding treatments with Sakha 8 cultivar. The highest populations of these weeds occurred in the weedy check plots under Giza 163 cultivar during all sampling dates.
2. Fresh weights of grassy, broad leaved and total annuals showed the highest values under weedy check plots with Giza 163 cultivar. The lightest weight of these weeds were recorded by Arelon and hand weeding plots under Sakha 8 cultivar during all samples.
3. The lowest values of dry weights for grassy, broad leaved and total weeds were recorded by Arelon and hand-weeded plots of Sakha 8 cultivar, Giza 163 recorded the largest weights of weeds under the untreated check plots.

4. Sakha 8 cultivar under hand-weeded and Arelon plots recorded the least leaf area index of grassy, broad leaved and total weeds. While the untreated plots of Giza 163 gave the largest values of leaf area index of weeds.
5. The effect of cultivars x weed control treatments x season interaction had no significant effects on number of broad leaved and total weeds at 60 days after sowing, fresh weight of broad leaved weeds at 60 DAS and 90 DAS and number of broad leaved weeds at 120 days after sowing in addition to dry weights of grassy and total weeds at 120 days from sowing.

VII. Effect of seeding rate x weed control treatment:

This interaction significantly affected all weed traits during all sampling dates.

1. The largest numbers of grassy, broad leaved and total weeds were recorded by weedy check plots under 40 kg/fed. The lowest populations of these weeds were recorded with Arelon and hand weeding treatments at 60, 90 and 120 days after sowing with 70 kg/fed. seeding rate.
2. Fresh weights of grassy, broad leaved and total weeds showed the highest values under the unweeded plots when sown by 40 kg/fed. at the three sampling dates.
3. Dry weights of grassy, broad leaved and total weeds were highest under the weedy check plots when sown by 40 kg/fed. under all sampling dates while the lowest values were recorded under Arelon treatment when sown by 70 kg/fed.
4. Weedy check plots under 40 kg/fed. recorded the largest values for leaf area index of broad leaved, grassy and total weeds under all sampling

dates while the lowest values were obtained from Arelon treatment under the highest seeding rate (70 kg/fed.).

5. The interaction between seeding rate, weed control and season had no significant effects on number of broad leaved at 60 and 120 days, fresh weight of total annuals at 60 DAS, fresh weight of broad leaved weeds at 90 and 120 DAS, dry weight of broad leaved weeds at 60 and 120 DAS and dry weight of total annuals at 60 DAS and leaf area index of broad leaved weeds at 60 and 90 DAS.

b. Wheat growth:

I. Effect of seasons:

1. The first season had the highest mean values of characters of wheat growth during the two sampling dates.
2. The seasonal effects were significant on all studied characters for wheat yield and yield components with exception of weight of grains/spike and spike weight.

II. Varietal performance:

1. Sakha 8 cultivar considerably exceeded the other two cultivars in plant height, tillers number/m^2 fresh and dry weights/m^2 at both early and late growth stage.
2. Leaf area index at 60 DAS was significantly higher with Sakha 8 than both Giza 163 or Sakha 61 cultivar.
3. The interaction between cultivars and seasons significantly affected all wheat growth measurements except for fresh weight/m^2 at 60 and 120 days after sowing.

III. Effect of seeding rates:

1. seeding rate significantly increased plant height and tillers number/m^2 of wheat.

2. The highest values of plant height and tillers number/m^2 were achieved by the application of 70 kg/fed. at the two sampling dates.
3. Fresh and dry weight/m^2 were considerably increased by increasing seeding rate at early and late growth stages.
4. Leaf area index at 60 days after sowing was significantly increased by increasing seeding rate.
5. Seeding rate x season interaction, significantly affected all measurements of wheat growth at the first sample excluding fresh weight/m^2 while at the second sample, the effects were not significant, excluding plant height.

IV. Effect of weed control treatments:

1. Arelon and hand weeding significantly increased plant height and number of tillers/m^2 as compared to weedy check plots at the early and late growth stages.
2. Fresh and dry weights/m^2 markedly increased by controlling weeds with Arelon or hand weeding treatments at the two sampling dates.
3. Leaf area index at 60 days after sowing was significantly increased by using Arelon or hand weeding treatments for weed control compared to the untreated plots.
4. The interaction between weed control treatments and seasons had significant effects on number of tillers/m^2 at 60 and 120 days after sowing, dry weight and leaf area index at the early growth stage and plant height at the late stage of growth. However the rest traits were insignificantly affected by this interaction.

V. Effect of the interaction between cultivars and seeding rates:

The interaction between cultivars and seeding rate insignificantly affected fresh weight/m^2 at 60 days after sowing and number of tillers/m^2

at 120 days after sowing while all the rest measurements of growth were significantly affected by this interaction.

1. Plant height and dry weight/m^2 recorded the highest values with 70 kg seeding rate while the lowest values were obtained with 40 kg seeds/fed.
2. The highest values for plant height were obtained from Sakha 8 cultivar when sown by 70 kg seeds/fed.
3. The heaviest dry weight/m^2 at 60 and 120 days after sowing were recorded by Sakha 8 cultivar with 70 kg/fed. seeding rate.
4. Fresh weight/m^2 at 120 days showed the highest value with Sakha 8 cultivar seeded by 70 kg/fed. While the lowest one recorded by Giza 163 when 40 kg seeds/fed. was used.
5. Leaf area index of wheat reached the largest value with Sakha 8 cultivar when sown by 70 kg/fed. whereas the lowest values were obtained from Giza 163 and Sakha 61 with at a rate of 40 kg/fed.

6. The interaction of cultivars x seeding rates x seasons had significant effects on all tested measurements except with plant height at 60 days after sowing.

VI. Effect of the interaction between cultivar and weed control treatments:

The interaction between cultivar and weed control treatments significantly affected all growth characters of wheat.

1. Sakha 8 under Arelon treatments recorded the highest values of plant height at the first and second samples, fresh weight, dry weight and leaf area index.
2. Giza 163 under unweeded check plots showed the lowest values of plant height, tillers number, fresh and dry weights and leaf area index.

3. The effect of cultivar, weed control treatments and seasons interaction was significant on all traits except of plant height at the first sample, fresh and dry weights of the second sample.

VII. Effect of the interaction between seeding rates and weed control treatments:

The interaction between seeding rates and weed control treatments had significant effects on all growth traits except of plant height.

1. Arelon treatment under 70 kg/fed. seeding rate achieved the highest values of number of tillers/m^2, fresh weight and dry weight/m^2 during the first and second sampling dates.
2. Weedy check treatment under 40 kg seeds/fed. recorded the least values of all previous growth measures under both samples.
3. The largest value of leaf area index was recorded under Arelon plots when sown by 70 kg/fed. while the untreated check plots gave the lowest values of this trait.
4. The interaction of seeding rate x weed control treatment x seasons insignificantly affected number of tillers /m^2, fresh and dry weight/m^2 at 120 days from sowing.

C. Wheat yields and yield components:

I. Effect of seasons :

The seasonal effects were significant on the most of the studied characters for weed growth during the three sampling dates excluding the numbers of total weeds at 60 and 120 days after sowing.

II. Varaital performence:

1. Using Sakha 8 cultivar increased spikes number/m^2, number of grains/spike, grain and biological yields per fed.

2. Sakha 61 cultivar recorded the highest mean values of 1000-grain weight, spike weight, spike length and number of spikelet/spike.
3. Giza 163 cultivar recorded the lowest mean values for all studied measurements with exception of weight of grains/spike; spike weight and number of spikelets/spike.
4. The effects of cultivar x season interaction were insignificant on all tested characters with the exclusion of grains number and weight/spike.

III. Effect of seeding rates:

1. Increasing seeding rate significantly increased number of spikes/m^2, grain and biological yields/fed.
2. The lowest seeding rate (40 kg/fed.) recorded the highest values of spike length, number of spikelets/spike, No. of grains/spike; spike weight, weight of grains/spike and 1000-grain weight. However, the highest seeding rate (70) kg/fed. had the lowest values of the above mentioned traits.
3. The seeding rate of 55 kg/fed. had the intermediate values for all characters.
4. The interaction of seeding rate x season had insignificant effects on all studied measurements for wheat yield and yield components, excluding grains number/spike.

IV. Effect of weed control treatments:

1. Arelon or hand weeding markedly increased all studied, characters for yield and its componets compared to the untreated plots.
2. Arelon treatment greatly increased number of spikes/m^2, 1000-grain weight, grain and biological yields/fed. than hand weeding.

3. Hand weeding recorded the highest values for spike length, number of spikelets/spike, number of grains/spike, spike weight and weight of grains/spike.
4. The interaction between weed control treatments and seasons insignificantly affected all the studied characters with the exclusion of No. of spikes/m^2, weight of grains/spike and grain yield/fed.

V. Effect of the interaction between cultivars and seeding rates:

The interaction between cultivars and seeding rates had significant effects on spike weight of grains/spike, and grain yield. The other yield components and biological yield insignificantly affected by this interaction.

1- Giza 163 cultivar gave the heaviest spike weight and grains/spike under seeding rate of 40 kg/fed. while Sakha 8 recorded the lowest values of these traits when sown by 70 kg/fed.
2- Sakha 8 cultivar produced the highest grain yield when sown by 70 kg/fed. while Giza 163 recorded the lowest yield under 40 kg seeding rate.
3- The interaction of cultivar x seeding rate x season had significant effect on spike weight and grain yield/fed.

VI. Effect of the interaction of cultivar x weed control treatments:

The interaction of cultivar x weed control treatments significantly affected spike length, spike weight, weight of grains/spike and biological yield of wheat.

1. Sakha 61 under hand weeded plots gave the longest and heaviest spikes.
2. Sakha 8 under Arelon treatment recorded the highest biological yield.
3. Giza 163 cultivar produced the lowest values of the previous traits under weedy check plots.

4. The interaction between cultivar weed control and seasons had significant effects on weight of grains/spike and biological yield.

VII. Effect of the interaction between seeding rate and weed control treatments:

The interaction between seeding rate and weed control treatments had significant effects on grain and biological yields/fed.

1. Arelon treatment under 70 kg/fed. seeding rate achieved the highest values of grain and biological yield/fed.
2. The lowest values of grain and biological yields/fed. were recorded by the untreated check plots when sown by 40 kg seeds/fed.
3. The interaction of seeding rate x weed control treatments x seasons had significant effects on both grain and biological yields/fed.