

**Study of different retting methods for some of local and
imported flax varieties and economic evaluation**

By

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5. English Summary

This investigation was carried out during 2016/2017 and 2017/2018 season at El-Gemmeiza Res. Station El-Gharbia Governorate, through two experiments, to study the difference between some of local and imported varieties (Giza 9, Giza 10, Sakha 3 , Sakha 4 , Omena , Egata, Melano and Sezar) with applying two different methods for retting in separating retens, change retting water every 24, 48 and 72 hr. (as Exp. 1) and raising the temperature degree from 28 up to 37 °C all over the day (as Exp. 2) through enclosed retens except the first temperature degree, whereas control treatment was retting with still water under temperature degree ranged from 28 up to 32 oC through open retens.

Spilt plot design with three replications had been adapted, where the eight varieties located the main plots, whereas retting methods represented the sub-plots .

The results of the studied characters for this research: -

The findings will be classified in to 3 parts.

Part 1: - Yield and yield components properties.

In both growing seasons, the maximum averages of No. of caps./plant, No. of seeds/ caps., seed yield/fed.(Kg.) and straw yield/fed.(ton) were belonged to the studied local varieties, i. e. Giza 9 and Giza 10 varieties recorded 19 and 18 caps./plant, while Giza 10 var. scorded 8.81 and 9.02 as seed index, in the first and

English Summary

second season, respectively. Whereas plant height, technical length (cm.) and fiber yield/fed.(Kg.), their averages were higher in both seasons, (i. e. Melano var. recorded 103.57 cm in the first season and 104.35 cm., for technical length in the first season and 98.11 cm. in the second one). The greatest mean of fiber yield/fed. associated with Omena var. (678.23 Kg), in the first season, meanwhile it was attributed with Milano var. (631.19 Kg) in the second one.

The genetical difference between the studied genotypes may be due to the presence of Jasmonic acid (JA) in plant cell that its functions differed with the development stage and the created interaction between genotype and environmental stimuli, or the presence of alternative terminal oxidase in the plant that its function differed with different locations in the plant.

Part 2: - Effect of the two retting methods on the studied fiber properties.

The results of this investigation approved that change retting water every 24, 48 and 72 hr. or raising the temperature degree from 28 up to 37 oC declined the days up to the complete retting with significant level as compared with the control, in separating rettings. Changing retting water every 72 hr. gave the highest fiber %, the longest fiber and the medium fine fiber (22.05 , 22.00 % 87.44 , 88.15 cm. , 244.52 and 243.65 N/m) as comparing with the control treatment that scored the lowest averages (21.25% , 83.87, 85.16 cm, 240.67 N/m) in the first and

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second season, respectively. Also, raising the temperature degree up to 37 oC gave the highest averages for fiber %, length and the medium fiber fineness, thier values were (22.14, 22.03 %, 87.15, 88.43 cm, 249.66 and 249.97 N/m), whereas control treatment resulted in the lowest averages (21.26 % , 83.98 , 85.17 cm, 240.67 and 241.26 N/m) in both seasons, respectively.the difference between them was significant .

These results might be due to change water retting in limited hours or raising it from 28 up to 72 oC gave the chance for microbes or fungi in retting water to produce some of enzymes that enable to degrade pectins and adhesive materials between fiber and stem .

Eventually, retting period/ hrs., and the studied fiber quality properties were affected significantly by the interaction between (genotype X treatments). Sezar var., as retting with change water every 72 hr. or raising the temperature degree of warm water up to 37 oC declined the retting period up to 7 days or 6.30 days, enduring with the control treatment (8.30 and 8.5 day) in 2017/2018 season.

Under the circumstances of changing retting water every 72 hrs. Sezar var. pronounced its superiority due to fiber %, in both seasons comparing with Giza 9 var. that gave the lowest % under the control treatment. Whereas Egata var. confirmed its out yielded as changing retting water every 48 hr. during 2016/2017 season as for fiber length, comparing with Sakha 3 var. under

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control treatment, but in the second season, Melano var. as exposing to change retting water every 72 hr. gave the longest fiber comparing with Sakha 4 var. under the control treatment,. With regard to fiber fineness, Omena var. as exposing to change retting water every 72 hr. recorded the medium fine fiber (258.71 N/m) in the first season and (257.61 N/m) in the second one, as comparing with the control treatment (Giza 9 var. as retting with still water under the temperature degree within 28 up to 32 oC) that gave the lowest mean (212.61 N/m).

As for the significant effect of raising temperature degree from 28 up to 37 oC on fiber quality properties for the different studied genotypes (Genotype X Treatment). The results cleared that, Sezar var. pronounced its superiority within the temperature degree from 28 up to 37 °C, resulted in the highest fiber %, as compared with retting Giza 9 var. straw with control treatment, in both seasons. Whereas, Melano var. with the application of retting with warm water at 37 oC awarded the longest fiber comparing with Sakha 3 or Sakha 4 varieties under control treatment that gave the shortest fibers.

Omena var. as retting its straw with warm water at 37 oC gave medium fiber fineness (259.62 N/m, in the first growing season) and (261.19 N/m, in the second growing season) comparing with Giza 9 var. under retting control treatment that recorded the lowest averages (212.61 and 213.37 N/m) in both seasons.

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Part 3: - The economic evaluation for this study under the conditions of Gemmiza Res. Station.

With respect to the studied local varieties in 2016/2017 season the agricultural operations costs till pulling the yield reached about 7690 Eg. P., while it was 115 Eg.P. in 2017/2018 season. Meanwhile, the total cost of the post agriculture process after pulling reached 2685 Eg. P. in the first season. For the flax seeds, thier amounts were 470.8 Kg. with 4707 Eg. P., long fibers amounted to 298.75 Kg with 7557.5 Eg. P. . The value of secondary outcomes amounted to 1217.2 Eg. P., whereas the average net return/fed. was about 5.11 thousand Eg. Pound. In 2017/2018 season, seeds amount reached to 468.5 Kg at a value of about 7020 EG. P. while the productivity of long fibers weighted 284.7 Kg, its value equal 15659 Eg. P. The value of the secondary outputs was 3093 Eg. P., while the average total cost/fed. was about 15.15 thousand Eg. P., whereas net return/fed. reached 10.62 thousand EG. P.

Some economic measures of production costs, return and the net yield of flax crop for some studied local varieties had been studied in this investigation.

For ex., in 2016/2017 season, it was found that the proportion average cost of pre-pulling processes to the total cost/fed. equal 74.17%, while it was 25.86 % as for post-pulling processes. The proportion average of main products return to the total yield/fed. equal 92.06%, also the proportion average of

English Summary

return from long fibers to average total return/fed. was determined at 61.45%. With respect to the return from seed amount to average total yield/fed. was 30.61%, meanwhile it was 7.94 % due to the average return of the secondary output products in proportion to the average total yield/fed.

It was interesting to note that, the average return rate in proportion to the invested Eg. P., it reached to 14990 and it was 49.27% for the net return in proportion to the invested Eg. P.

It is turn out to be that, the averages costs of cultivating operations up to pulling date for some imported flax varieties under study was 8140 Eg. P. during 2016/2017 season, while it was 12149 Eg. P. during the second season with counting rental value. On the other hand, average of total cost due to post-pulling operations equal 2650 Eg. P. during 2016/2017 season, whereas that value was increased up to 4376 Eg. P. through 2017/2018 one with counting the rental value. Concerning the average productivity per./fed. due to flax seeds is about 242.5 Kg, its value was 2420 Eg. P. through the first growing season, meanwhile the productivity of long fibers reached 649.5 Kg, its value was 20786 Eg. P. . Respecting to the values of secondary outcomes are about 658 Eg. P. . Eventually, the average total cost/fed. equals 10.84 thousand Eg. P., whereas the average of net return/fed. was about 13.03 thousand.

English Summary

During 2017/2018 season, the average producing of seeds/fed. weighed 244.3 Kg., its value was 3664.5 Eg. P., while it was 615.65 Kg. for long fiber which its value was 33868 Eg. P. .

At last, the value of secondary outputs reached about 1548 Eg. P. so, it was summarized that the average total cost/fed. was about 16.5 thousand Eg. P., whereas the average net return/fed. was about 22.6 thousand Eg. P.

Some economic measures were studied, in 2016/2017 season for example. i. e. the average of pre-harvest cost in proportion to the total cost/fed. reached about 75.15 % , while it was 24.88 % for the average of post-pulling cost ratio to the total production cost/fed. the average ratio of return from the main output to the total cost yield/fed. was about 97.24 % , meanwhile, the average return from long fibers in proportion to the total return/fed. equals 87.10.%

This economic study for that research cleared that the average ratio of return from the seed/yield was about 10.14 % from the average total yield/fed., added to that the average percentage of secondary output products in proportion to average yield/fed. was 2.76 % . The average ratio of return in proportion to invested Eg. P. during the cultivation of the imported varieties was 220.36 % and 120.36 % as for the average net return.

From the above mentioned results, it could be concluded that the imported varieties exceeded in the productivity of long fibers by 340.86 Kg., it equal 116.2 % as compared with that of local genotypes under study. Also, the average of net return in proportion to the invested Egypt P. was higher by 68.3 %.