GIFT OF

EX LIBRIS

AGRIC. LIBRARY
A CURRENT WITH FEAR GROWING
THE SYMPATHY FLOW AT SHARKRA.
...
MINISTRY OF AGRICULTURE, EGYPT.

TECHNICAL AND SCIENTIFIC SERVICE.

Bulletin No. 12.

(FIELD CROPS.)

EXPERIMENT WITH FLAX GROWING

AT THE GOVERNMENT FARM AT GUERMMEIZA,

BY

GERALD C. DUDGEON, F.R.S.,
CONSULTING AGRICULTURIST, ETC.

CAIRO,
GOVERNMENT PRESS.

To be obtained, either directly or through any Bookseller, from the GOVERNMENT PRESS, Bulaq, and from the SALE-ROOM,
Old Ismailia Palace, Sharia Qasr el Aini.

1917.

Price P.T. 2.
The chief sources of the supply of flax to England and France having been cut off by the European war, the price of this product has been so enhanced that it appears worthy of consideration whether in some parts of Egypt it might not prove a profitable venture to plant the crop on a more extensive scale than has been adopted since the establishment of a specialized cotton taught the cultivator to consider the last-named fibre crop the main source of wealth. Previous to the cultivation of cotton on a commercial scale, flax was an important crop, and many looms were found in different parts of Egypt entirely devoted to the weaving of it.* The cultivation of the plant has now almost completely died out, as the figures of the last few years' areas show:

1912-1913 = 1,592 feddâns.  
1914-1915 = 866 feddâns.  
1913-1914 = 906  "  
1915-1916 = 1,418  "

Whether the deleterious effect of flax-growing upon the soil, which is complained of in some of the northern countries, is felt in Egypt, it has been difficult to definitely determine. Habitual flax-growers in this country maintain that there is no deterioration, and it

* Refer, BREASTED, A History of Egypt, p. 96 (1906); GIRARD, Description de l'Egypte, XVII, p. 213 et seq. (1821), etc., etc.
may well be that, upon the rich soils of Egypt, a crop of flax does not exert such a severe influence as would be experienced in other localities where less fertile conditions exist.

In view of the high price of flax, and doubtless to a great extent to the advocacy of flax-growing by an association of growers interested with the provision of the fibre to the French markets, the area under the crop almost doubled itself in the last year, and it is probable that a further extension will be made in the coming winter. The group of growers above referred to have introduced a plant, the seed of which is said to have been obtained from Ireland, which possesses a longer stem than that which has been cultivated in Egypt from the earliest times. This plant has apparently given good results, although no particulars regarding it have yet been obtainable.

The experiments conducted during 1915–1916 at the Government Farm at Guemmeiza were undertaken with Egyptian seed only, and the primary object was to determine what rate of sowing would produce the best results, both with reference to seed (linseed) and flax; the method employed in the country being that for obtaining a yield of both together. To this end an evenly conditioned piece of land was prepared measuring one feddān (1.038 acres), and was cut up into three sections, marked I, II, III in the plan given below. The first of these sections was to be sown at the rate of 5 kēlas per feddān, the second at 6½ kēlas, and the third at 8 kēlas. A modification of the original scheme was suggested by Mr. Hughes, the Chemist of the Ministry of Agriculture, and was adopted. According to this, each of the sections was subdivided into three plots, shown as A, B, and C, in the plan, all of the A plots being harvested before the seed had formed completely in order that a better fibre might be obtained, though sacrificing the seed crop; those shown as the B plots were harvested later with a view to obtaining the maximum results with respect to both fibre and seed; and those marked C still later with the seed crop mainly in view. Thus, instead of three experiments as originally proposed, nine equal plots were dealt with, each presenting a different method of treatment.

The whole area was uniformly manured with a dressing of 16 cubic metres of farmyard manure and 90 kilos. of nitrate before the first watering.
All the plots were sown on November 19, 1915, and were harvested on the following dates:

<table>
<thead>
<tr>
<th></th>
<th>Time occupied by Crop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA, II A, and III A</td>
<td>March 10... 112 days.</td>
</tr>
<tr>
<td>IB, II B, and III B</td>
<td>April 2... 135 days.</td>
</tr>
<tr>
<td>IC, II C, and III C</td>
<td>April 7... 140 days.</td>
</tr>
</tbody>
</table>

Arrangement of plots and sections:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sown at 5 kēlas per faddān.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.</td>
<td>2(\frac{3}{4}) qirāts.</td>
<td>2(\frac{3}{4}) qirāts.</td>
<td>2(\frac{3}{4}) qirāts.</td>
</tr>
<tr>
<td></td>
<td>No seed.</td>
<td>Crop of seed= 180 rotls.</td>
<td>Crop of seed= 170 rotls.</td>
</tr>
<tr>
<td>Sown at 6(\frac{1}{2}) kēlas per faddān.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.</td>
<td>2(\frac{3}{4}) qirāts.</td>
<td>2(\frac{3}{4}) qirāts.</td>
<td>2(\frac{3}{4}) qirāts.</td>
</tr>
<tr>
<td></td>
<td>Crop of stalks= 397 rotls.</td>
<td>Crop of stalks= 130 rotls.</td>
<td>Crop of stalks= 422 rotls.</td>
</tr>
<tr>
<td></td>
<td>No seed.</td>
<td>Crop of seed= 175 rotls.</td>
<td>Crop of seed= 176 rotls.</td>
</tr>
<tr>
<td>Sown at 8 kēlas per faddān.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III.</td>
<td>2(\frac{3}{4}) qirāts.</td>
<td>2(\frac{3}{4}) qirāts.</td>
<td>2(\frac{3}{4}) qirāts.</td>
</tr>
<tr>
<td></td>
<td>Crop of stalks= 445 rotls.</td>
<td>Crop of stalks= 404 rotls.</td>
<td>Crop of stalks= 473(\frac{1}{4}) rotls.</td>
</tr>
<tr>
<td></td>
<td>No seed.</td>
<td>Crop of seed= 154(\frac{1}{2}) rotls.</td>
<td>Crop of seed= 176(\frac{1}{2}) rotls.</td>
</tr>
</tbody>
</table>

It should be mentioned, with regard to the crops of stalks shown in each of the plots on the plan, that very little reliance can be placed upon the figures given, as any slight delay occasioned during the weighing of any lot might easily affect the result to the extent of the differences shown.

After weighing the green stalks, they were placed in a retting pit and left for from eight to ten days, following which they were thoroughly dried and again weighed. Mr. Hughes has dealt with the results obtained in a report which he supplied to me, and the details of weights, analyses, and valuations, are quoted here in extenso from the same.
The first three plots were harvested on March 10, and yielded as follows (the following is taken from the report supplied by Mr. Hughes, modified only with respect to the numbering of the sections to correspond with the plan given above):

<table>
<thead>
<tr>
<th>Plot</th>
<th>Seed per Feddān.</th>
<th>Retted stalks per Plot.</th>
<th>Stalks per Feddān.</th>
<th>Fibre per Cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I A</td>
<td>5</td>
<td>314</td>
<td>2,826</td>
<td>8</td>
</tr>
<tr>
<td>II A</td>
<td>6½</td>
<td>310</td>
<td>2,790</td>
<td>9</td>
</tr>
<tr>
<td>III A</td>
<td>8</td>
<td>315</td>
<td>2,835</td>
<td>12</td>
</tr>
</tbody>
</table>

"The proportion of fibre was determined by hand-scutching and combing. It is possible that the results are somewhat higher than would be obtained from the material in bulk. As, however, all the determinations were made by the same individual in the same manner, they should be strictly comparable.

"A number of the dry stems from each plot were measured to ascertain what difference in diameter, if any, was caused by the variation in the amount of seed employed. Twenty-five stems were measured from each plot:

<table>
<thead>
<tr>
<th>Sowing</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Mean</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Millimetres</td>
<td>Centimetres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kēhas.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1·82</td>
<td>1·12</td>
<td>1·48</td>
<td>70</td>
</tr>
<tr>
<td>6½</td>
<td>2·03</td>
<td>0·75</td>
<td>1·26</td>
<td>70</td>
</tr>
<tr>
<td>8</td>
<td>1·77</td>
<td>0·66</td>
<td>0·95</td>
<td>60</td>
</tr>
</tbody>
</table>

"This difference in the size of the stalks was quite noticeable in the growing crop. The stems of the thickly sown plot were unbranched. It was observed that the fibre from these thickly sown plots was also lighter in colour and softer to the touch than that from the other plots.

"The seed from the early harvested plots was so immature as to be of no value. Taking the value of the fibre as P.T. 6 per oke, the
value of the produce from the early harvested plots works out as follows:

<table>
<thead>
<tr>
<th>Plot</th>
<th>Kèlas Seed</th>
<th>P.T.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I A</td>
<td>5</td>
<td>489</td>
</tr>
<tr>
<td>II A</td>
<td>6½</td>
<td>542</td>
</tr>
<tr>
<td>III A</td>
<td>8</td>
<td>737</td>
</tr>
</tbody>
</table>

"The additional seed is amply repaid in the crop, but the total return is not satisfactory.

"The second set of plots was harvested on April 2. By this time the seed was fully developed, but not quite ripe.

<table>
<thead>
<tr>
<th>Plot</th>
<th>Sowing</th>
<th>Rotted Stalks</th>
<th>Fibre per Cent.</th>
<th>Seed</th>
</tr>
</thead>
<tbody>
<tr>
<td>I B</td>
<td>5</td>
<td>318</td>
<td>14</td>
<td>180</td>
</tr>
<tr>
<td>II B</td>
<td>6½</td>
<td>338</td>
<td>13½</td>
<td>174</td>
</tr>
<tr>
<td>III B</td>
<td>8</td>
<td>350</td>
<td>17</td>
<td>154½</td>
</tr>
</tbody>
</table>

"Calculating the yield per feddán, we obtain the following on the basis of the above:

<table>
<thead>
<tr>
<th>Plot</th>
<th>Sowing, Kèlas per Feddán</th>
<th>Fibre, Rotis per Feddán</th>
<th>Seed, Ardeb per Feddán</th>
</tr>
</thead>
<tbody>
<tr>
<td>I B</td>
<td>5</td>
<td>401</td>
<td>5·89</td>
</tr>
<tr>
<td>II B</td>
<td>6½</td>
<td>104</td>
<td>5·72</td>
</tr>
<tr>
<td>III B</td>
<td>8</td>
<td>535</td>
<td>5·06</td>
</tr>
</tbody>
</table>

"Taking the fibre as worth P.T. 6 per oke, and the seed at P.T. 285 per ardeh (Monthly Crop Report—April), we find the following gross returns for the different plots:

<table>
<thead>
<tr>
<th>Plot</th>
<th>Value of Fibre</th>
<th>Value of Seed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I B</td>
<td>868</td>
<td>1,678</td>
<td>2,546</td>
</tr>
<tr>
<td>II B</td>
<td>875</td>
<td>1,630</td>
<td>2,505</td>
</tr>
<tr>
<td>III B</td>
<td>1,159</td>
<td>1,143</td>
<td>2,602</td>
</tr>
</tbody>
</table>
"It will be noticed that there is very little difference between the first two plots; in the plot sown with 8 kēlas (III B) there is a falling off in the amount of seed, but a very considerable increase in the yield of fibre.

"The remaining third of each section was harvested on April 7. The seed was then quite ripe, and shelled easily. The results were similar to the above, except that there was a larger proportion of fibre.

<table>
<thead>
<tr>
<th>Plot</th>
<th>Sowing, Kēlas per Feddān</th>
<th>Retted Stalks, Rotls per Plot</th>
<th>Fibre per Cent.</th>
<th>Seed, Rotls per Plot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I C</td>
<td>5</td>
<td>263</td>
<td>17</td>
<td>170</td>
</tr>
<tr>
<td>II C</td>
<td>6½</td>
<td>374</td>
<td>16</td>
<td>176</td>
</tr>
<tr>
<td>III C</td>
<td>8</td>
<td>372</td>
<td>19</td>
<td>176</td>
</tr>
</tbody>
</table>

"Calculating the yield per feddān, we find on the basis of the last figures :—

<table>
<thead>
<tr>
<th>Plots</th>
<th>Sowing, Kēlas per Feddān</th>
<th>Fibre, Rotls per Feddān</th>
<th>Seed, Ardebs per Feddān</th>
</tr>
</thead>
<tbody>
<tr>
<td>I C</td>
<td>5</td>
<td>403</td>
<td>5·58</td>
</tr>
<tr>
<td>II C</td>
<td>6½</td>
<td>540</td>
<td>5·77</td>
</tr>
<tr>
<td>III C</td>
<td>8</td>
<td>636</td>
<td>5·78</td>
</tr>
</tbody>
</table>

"Taking the same values for the produce as were adopted above, we get as gross return per feddān :—

<table>
<thead>
<tr>
<th>Plots</th>
<th>Value of Fibre, P.T.</th>
<th>Value of Seed, P.T.</th>
<th>Total, P.T.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I C</td>
<td>872</td>
<td>1,590</td>
<td>2,462</td>
</tr>
<tr>
<td>II C</td>
<td>1,168</td>
<td>1,640</td>
<td>3,808</td>
</tr>
<tr>
<td>III C</td>
<td>1,378</td>
<td>1,645</td>
<td>3,023</td>
</tr>
</tbody>
</table>

"The seed from all the plots was very similar, the weight per ardeb varying only from 275 to 278 rotls.

"It will be noticed that in every case the stalks from the most thickly sown plot have contained the largest proportion of fibre. The plots sown with 5 and 6½ kēlas of seed show no significant difference.
From the above figures, it certainly appears that the 8-kélas sowing is to be recommended. In every case the increased produce much more than compensated for the additional outlay in seed.

"As regards the quality of the fibre, the time of pulling appeared to have little effect. In every case, however, it was noticed that the fibre from the most thickly sown plot was lighter in colour and softer to the touch than that from the other plots.

The seed obtained from the various plots in the two later harvests was examined as to oil content with the following results (petroleum ether was used as solvent):

<table>
<thead>
<tr>
<th>Plots</th>
<th>Harvested April 2.</th>
<th>Sowing</th>
<th>Oil per Cent.</th>
<th>Plots</th>
<th>Harvested April 7.</th>
<th>Sowing</th>
<th>Oil per Cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Kélas.</td>
<td></td>
<td></td>
<td></td>
<td>Kélas.</td>
<td></td>
</tr>
<tr>
<td>I B</td>
<td></td>
<td>5</td>
<td>34.5</td>
<td>I C</td>
<td></td>
<td>5</td>
<td>35.4</td>
</tr>
<tr>
<td>II B</td>
<td></td>
<td>6½</td>
<td>34.9</td>
<td>II C</td>
<td></td>
<td>6½</td>
<td>36.0</td>
</tr>
<tr>
<td>III B</td>
<td></td>
<td>8</td>
<td>36.1</td>
<td>III C</td>
<td></td>
<td>8</td>
<td>35.8</td>
</tr>
</tbody>
</table>

"There is thus no great difference in the oil content. This is in accordance with the results obtained by Eyre and Fisher* in England.

"They found that during the last twenty-two days the oil content only increased by 2.5 per cent. It is therefore not surprising that no considerable increase was found in the seed from Guennmeiza where the interval was only five days.

"It would appear that in England much less seed was employed for sowing. In Eyre and Fisher's experiment, 1 cwt. per acre, or roughly 5 kélas per feddán, was considered as "thick" sowing, while their "thin" sowing was at the rate of only 70 lbs. per acre, or approximately 3 kélas per feddán. Possibly this difference is due to climate or to the fact that a larger variety of flax was used.

"The oil content of the different varieties of flax varies considerably, and it is pointed out in the above-mentioned papers that it is essential for both growers and buyers to realize that the value of the seed depends on the oil content, and on that only. The farmer who grows linseed must understand that he is really growing oil, and must select his seed with this object in view.

* "Journal of Agricultural Science," Vol. VII, p. 120 et seq.
"The idea that good fibre can only be obtained by harvesting the crop before the seed is ripe does not appear to have much foundation in fact; judging from the above results the best return is obtained in the later harvest.

"At the present time linseed oil is in great demand, and there seems every prospect of this demand continuing. It will therefore be well worth while to make further experiments with this crop, more particularly with some of the varieties which are known to give a large yield of oil. Morocco, Plate, Russian, and Indian varieties frequently give 40 per cent and more of oil. These should certainly be tried in this country."

In addition to the valuations for the cleaned fibre, given by Mr. Hughes, it may be of interest to cultivators and others to examine the results obtained from these experiments as a whole where the stalks are sold in an unsalted condition, such as is most frequently done in the country. As a matter of fact an offer of P.T. 60 per qantâr, delivered at Benha, was made for the unsalted crop from the whole area, though it was not accepted. This then can be taken as a basis of the price of the retted stalks in the present year, and the price of the seed may readily be assumed to be P.T. 290, which figure at the present moment it actually exceeds. *

The sections each yielded as under in rots of retted stalks:

<table>
<thead>
<tr>
<th>Section</th>
<th>Yield (rots)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>896</td>
</tr>
<tr>
<td>II</td>
<td>1,023</td>
</tr>
<tr>
<td>III</td>
<td>1,037</td>
</tr>
<tr>
<td>Total</td>
<td>2,956</td>
</tr>
</tbody>
</table>

This, at P.T. 60 per qantâr, is equivalent to L.E. 17·736 milliemes. Taking the seed yield at 5·63 ardebs, which is the rate per feddân calculated on the basis of the actual production of the six plots which were permitted to produce seed, and taking the price at P.T. 290 per ardeb, we find the value of the seed crop to be L.E. 16·327 milliemes per feddân, making a gross return of L.E. 34·063 milliemes per feddân. This will serve as an indication of the very satisfactory

* The prices per ardeb for ordinary linseed at Mina el Bassil, for October, averaged each week as follows: week ending 6th P.T. 273, 13th P.T. 278, 20th P.T. 295. The quality of the Guemmeiza crop was superior to the usual market sample.
result which can be obtained at the present time with respect to this crop, which only occupies the ground for four and half months.

Experiments are being arranged for in the coming winter with seed of new kinds imported from Ireland and India, the latter with a special view to obtaining better yields of linseed. It is hoped to make these experiments form the subject of a later note.
PUBLICATIONS.

"Agricultural Journal of Egypt"; published as often as sufficient material is collected.

The following publications may be obtained, either directly, or through any bookseller, from the Government Press, Bulâq; or from the Sale Room, Old Ismailia Palace, Sharia Qasr el 'Aini. Unless otherwise indicated, publications are in English.

**Agricultural Journal of Egypt.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>V. I</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>V. II</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>V. III</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>V. IV</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>V. V</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>V. VI</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

**Egyptian Agricultural Products.**

By Gerald C. Dudgeon, F.E.S., etc., Consulting Agriculturist.

No. 1 A. "The Great Millet (*Durra Baladi* or *Durra Rafi'a*) in Egypt." P.T. 3.
No. 3 A. "Gossypium Sp., Cotton (*Qutn in Egypt*)". History, Development, and Botanical Relationship of Egyptian Cottons, with tables showing Areas, Yields, Prices, and Distribution of the Varieties. P.T. 5.

**Technical and Scientific Bulletins.**

No. 1. "Report on the First Two Years' Working of the Plant Protection Law" (Law No. 5 of 1913), by G. Storey, B.A., F.E.S. (English or French.) P.T. 2.
No. 2. "The Nature of the Damage done by the Pink Boll Worm (*Gelechia Gossypiella* Saund.)," by Lewis Gough, Ph.D., F.E.S., etc. (English or French.) P.T. 1.
Technical and Scientific Bulletins (continued).


No. 12. "Field Crops" (Experiment with Flax growing at the Government Farm at Gueenmeiza), by Gerald C. Dudgeon, F.E.S., Consulting Agriculturist, etc. P.T. 2.

Leaflets of the Horticultural Section. By T. W. Brown, F.L.S., Director, Horticultural Section. (English or Arabic.) P.T. 1, unless stated otherwise.

(No number) "Citrus Trees."

No. 1. "French beans" (Fasoolia).

2. "Asparagus" (Kishk Amluz).


4. "Egyptian Arum" Qolqas.

5. "Cultivation of Potatoes."


7. "Custard Apple."

8. "List of Trees, Shrubs, and other Perennial Plants cultivated in the Ministry's Garden at Giza."

9. "Globe Artichoke" (Kharshuf).

10. "Strawberries" (Shouliekh or Frawla).


12. "Simple Instructions for preserving Tomatoes."

Collections of Agricultural Circulars. (See page 14.)

Nos. 1-18 (1911); Nos. 19-35 (1912); Nos. 36-60 (1913-1914). Three volumes, English or Arabic, P.T. 1 each.
LAWS AND REGULATIONS.
Price P.T. 2 each, unless stated otherwise.

"Regulations of the Boll Worm and Seed Worm Campaign, 1915." (English or Arabic.)
"Regulations of the Boll Worm and Seed Worm Campaign, 1916." (English or Arabic.)
"Regulations of Cotton Worm Campaign, 1915." (English or Arabic.)
"Regulations of Cotton Worm Campaign, 1916." (English or Arabic.)
"Collection of the Agricultural Laws." (French and Arabic.) P.T. 5.
"Collection of Veterinary Laws." (French and Arabic.) P.T. 5.
"Syllabus of the School of Veterinary Medicine." (French and Arabic.)
"Syllabus of the Intermediate School of Agriculture, Moshtohor." (English and Arabic.)

ADMINISTRATIVE REPORTS.

"Annual Report of the Veterinary Service, 1913." (English P.T. 2; Arabic P.T. 2.)
"Report on the Great Invasion of Locusts in Egypt in 1915." (English or Arabic.) P.T. 5.

EGYPTIAN AGRICULTURAL AND VETERINARY NOTES.
Price P.T. 1 each.

"Wheat Rust." (English or Arabic.)
"Wheat Smut." (English or Arabic.)
"Pamphlet on Ticks and their Relation with Agricultural Animal Diseases." (Arabic.)
"Pamphlet on Scale Insects." (Arabic.)
"Dialogue on Cotton Pests." (Arabic.)

BOOKS.

"Agricultural Text Book," Part I. (English P.T. 30; Arabic P.T. 12.)
"Agricultural Text Book," Part II. (English P.T. 45; Arabic P.T. 20.)
"Percival's Botany." (Translation). (Arabic.)
"Agricultural Chemistry," by Ingle. (Translation.) (Arabic.)
"Veterinary Medicine for Intermediate Schools of Agriculture." (Arabic.) P.T. 10.
AGRICULTURAL CIRCULARS.

The following circulars have been issued gratis in English or Arabic, or in both languages:

No. 1. "The Distribution of Improved Cotton Seed to Smaller Cultivators." (Arabic.)


3. "Assili Cotton." (English and Arabic.)

4. "Preservation of Ladybird Beetles (*Coccinellidae*)." (Arabic.)

5. "Cultivation of Castor Oil Plants (*Ricinus communis*)." (English and Arabic.)


7. "Distribution of Cotton Seed for 1912." (Arabic), and Supplement." (Arabic.)

8. "Manner of Distinguishing between the Useful Ladybird and the Injurious Melon Beetle." (English and Arabic.)

9. "Elimination of *Pink Cotton.*" (Arabic.)


11. "Sugar Cane and Millet Borer in Upper Egypt." (Arabic.)

12. "Destruction of Cotton Worm Pupae." (Arabic.)

13. "Danger of Excessive Irrigation of Maturing Cotton." (Arabic.)

14. "Precautions in Connection with *Boll Worm Attack.*" (Arabic.)

15. "Occurrence of Cotton Worm on Maize." (Arabic.)

16. "Distribution of Cotton Seed." (Arabic.)


18. "The Necessity of Uprooting the Cotton Sticks before the Land is sown with Winter Crops." (Arabic.)

19. "Cotton Cultivation in Upper Egypt." (English and Arabic.)

20. "Protection of the Buff-backed Egret." (English, French, and Arabic.)

21. "Hints on Cotton-growing in Egypt." (English and Arabic.)

22. "On using Nitrate of Soda in Maize Cultivation in Giza Province." (English and Arabic.)

23. "Preparations to combat the Cotton Worm." (Arabic.)

24. (Cancelled by No. 42.)

25. "Cut-worm." (Arabic.)

26. "Steps to combat the Cotton Boll Worm in May, June, and July." (English and Arabic.)

27. "Paraffin Emulsion." (English, French, and Arabic.)
No. 28. "Non Watering of Bersim." (Not published.)


30. The Danger of Overwatering Cotton Fields." (English and Arabic.)

31. (Cancelled by No. 45.)

32. "Advice to Farmers in Picking their Cotton." (Arabic.)

33. "Expedite the Picking of Cotton." (Arabic.)

34. "Distribution of Cotton Seed." (Arabic.)

35. " (English and Arabic.)

36. "Sore Shin." (Arabic.)

37. "Fumigation of Citrus Trees." (English and Arabic.)

38. "Pomegranate Worm." (English and Arabic.)

39. "The Smut Diseases." (English and Arabic.)

40. "Eradication of the Pink Boll Worm." (English and Arabic.)

41. "Resin Wash." (English and Arabic.)

42. (Cancelled by No. 52.)

43. "The Use of Nitrate of Soda in Maize Cultivation." (English and Arabic.)

44. "Lime and Sulphur Wash." (English, French, and Arabic.)

45. (Cancelled by No. 50.)

46. "Eradication of Fig Scale." (English and Arabic.)

47. "The Pink Boll Worm." (Not published.)

48. "Use of Sodium Nitrate in Maize Cultivation in the Provinces of Giza and Qaliubia." (Arabic.)

49. "Planting Fruit Trees." (English and Arabic.)

50. (Cancelled by No. 73.)

51. "Planting Instructions." (English and Arabic.)

52. "Method of Distinguishing the Eggs, Larvae, and Pupae of the Cotton Worm (Arabic: Dûd el Qun), Prodenia litura F.; the Small Green Leaf Worm (Arabic: El Dûd el akhdar el saghir), Laphygma exigua, Hb.: and the Greasy Cut-worm (Arabic: Dûd el Bersim), Agrotis ypsilon Rott." (English and Arabic.)

53. "Destruction of Aphis." (English and Arabic). (This Circular cancels Circulars Nos. 24 and 42.)

54. "Bordeaux Mixture." (French and Arabic.)

55. "Advice on the Destruction of Boll Worms." (English and Arabic.)

56. "Increase of Area sown with Cereals and other Food Crops," (Arabic.)

57. "Cultivation of Haricot Beans." (Arabic.)

58. "Hints on the Preparation of Egyptian Products for European Markets." (Arabic.)
No. 59. "Prices of Haricot Beans." (Arabic.)

"Cancelled by No. 72.

60. "The Seed Worm in Winter." (English and Arabic.)


62. "Instructions re Destruction of Locusts." (English and Arabic.)

63. "Instructions to 'Onudas to combat the Locusts." (Arabic.)

64. "Expedite the Harvesting of Wheat." (Arabic.)

65. "The Melon and Water Melon Aphis." (English and Arabic.)

66. "Planting Fruit Gardens." (English and Arabic.)

67. "Irrigation of Cotton Area." (Arabic.)

68. "Wheat Diseases.— Eel-worm (Tylenchus tritici, Bauer)." (English and Arabic.)

69. "Fumigation of Citrus Trees." (English and Arabic.)

(This Circular cancels Circulars Nos. 31, 45, 50 and its modification, and Circular No. 69.)

70. "Warning about Evils of Overwatering Cotton." (Arabic.)

71. "Nitrate Experiments on Nile Maize." (English and Arabic.)

72. "Destruction of Bolls remaining on Cotton Plants after the Last Picking." (English and Arabic.)

73. "Precautions for Sowing Wheat." (English and Arabic.)

74. "Precautions for Cultivation of Beans." (English and Arabic.)

75. "Hay and Hay-making in Egypt." (English and Arabic.)

76. "Precautions for sowing wheat." (English and Arabic.)

77. "Foot and Mouth Disease." (English and Arabic.)

78. "Aphis on Cotton Trees and its Treatments." (English and Arabic.)

79. "Nitrate Experiments on Nile Maize." (English and Arabic.)

80. Circular and Arrêté re "Fixing Date for Picking and Destroying of Cotton Bolls.

81. "Improvement of the Egyptian Wheat."