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INFORMATION ON COTTON PRODUCTION IN CHINA, 1951

M'en-ch'an Kung-tso Ts'an-k'ao Tzu-liao
(Reference Materials on Cotton Production)
Peiping, 1952

Summary: Deep plowing, retention of soil moisture, seed selection, soaking and disinfection of seeds, close planting in hills or rows, protection of plants and transplanting when necessary, increased use of fertilizers and irrigation, and better provisions for insect control are greatly increasing the production per unit of area of cotton in China.

The 1953 production goal of the Yun-ch'eng State Farm in Shansi was 1,000 catties of unginned cotton per mou on irrigated land and 600 catties per mou on nonirrigated land.

On the Shuang-ch'iao Experimental Farm near Peiping, introduction of Soviet techniques, particularly close planting and deep plowing, increased the yield from 34 catties of unginned cotton per mou in 1949 to 380 catties in 1951.

I. TECHNIQUES FOR HIGH COTTON PRODUCTION

A. Deep Plowing

The development and introduction into general use of new-type implements that permit deep cultivation is a matter of high priority for increasing the cotton yield per unit of area in new China. Old-type implements seldom permitted disturbing the soil to a depth greater than 3 inches. Plowing to a depth of 5-7 inches is now the settled goal.

B. Retention of Soil Moisture

Promotion of the technique of conserving soil moisture by frequent harrowing and other means of maintaining a loose surface in the fields is one of the most important developments occurring in the cotton culture program of new China.

C. Seed Selection

Since 1950, the program of the Central People's Government for seed selection to improve cotton quality by uniformity of seeds has been raised from a former level of 70 percent to a level of 90 percent and in some cases even 98 percent. Model cotton growers emphasize the following specifications in seed selection: Sturdy, high producing, early ripening plants, free from all trace of insect or disease damage, with long, even fibers, and able to withstand wind and rain damage are the types to be selected for seed. Before planting, careful screening of the seed by hand must be carried out to eliminate all inferior seeds.

STAT

D. Soaking and Scalding Seeds

Soaking seeds to hasten sprouting and pouring boiling water over them to destroy disease bacteria is a technique more frequently used. After soaking, the seed may be mixed with wood ashes or gravel to prevent bunching and to promote even sprouting. The seeds should be planted just after the sprouts begin to appear but before they become long enough to rub off.

E. Planting

The chief advances made have been in timing, taking advantage of soil moisture by deep-planting (three or four fingers deep), by planting in hills or rows and covering with moist earth which is in turn covered by dry earth.

F. Protection and Transplantation of Plants

Where plants fail to come up the skips should be immediately replanted with the same kind of seed. Interplanting of other crops is not recommended for cotton fields. During the last 2 years a new technique, transplanting cotton to replace plants that failed, has been developed. In Liaosi Province in 1950, some 58,000 plants were transplanted with a survival rate of 95 percent. In 1951, the practice spread much farther. In one case, a yield of 450 catties of unginned cotton per mou was obtained from plants transplanted as late as 28 May.

In 1951, the practice of combining thinning of cotton plants with detection of cotton aphids was initiated. This is a valuable technique worthy of widespread emulation.

G. Close Planting

It has now been demonstrated by a number of state farms and model cotton growers that the Soviet contention that, given sufficient moisture and an increase in the proper use of the right kinds of fertilizers, significant cotton production increases can be secured by close planting.

H. Fertilization

There has been a notable increase in the use of fertilizer by Chinese cotton growers during recent years. The general increase in 1951 over 1950 was from 20 to 30 percent. Bean cake, alone, supplied to Hopeh cotton growers in 1951 amounted to 470 million catties, a 300 percent increase over 1950. Ch'u Yao-li, model cotton raiser of Shansi, used 12,000 catties of barnyard manure as basic fertilizer and 16 catties of ammonium sulfate as follow-up fertilizer. Liang Chia-jui, model cotton raiser of Hopeh, used a mixture 9,000 catties of barnyard manure, 150 catties of flaxseed cake, and 100 catties of bean cake as a basic fertilizer, with 34 catties of ammonium sulfate as follow-up fertilizer. These two farmers secured up to 912 and 745 catties of unginned cotton per mou, respectively.

I. Irrigation

Model cotton raisers have been giving careful study of the improvement of irrigation techniques for cotton fields.

STAT

J. Insect Control

There has been much improvement in insect control. The principle of early, over-all, and continuous extermination has been popularized. Technical development in the scientific application of dusting and spraying procedures has been rapid. Stations to compound insecticide formulas are being established in various areas to supply chemical insecticides to the farmers in surrounding areas.

K. Pruning and Topping

Pruning, suckering, top thinning, bole thinning, and late season leaf thinning are becoming standard procedures with progressive cotton growers in China.

II. REPORT ON YUN-CH'ENG STATE FARM

A. Production Data1. Large-Scale Cultivation

The production area involved was 804 mou and the types planted were Ching-ssu, Ssu 4B, and 517. Total production was 237,839.08 shih-chin (one shih-chin equals 0.5 kilogram) of unginned cotton, an average of 295.86 shih-chin per mou.

The breakdown of plots and production figures are as follows:

<u>Size of Irrigated Field (mou)</u>	<u>Type</u>	<u>Total Production, Unginned (shih-chin)</u>	<u>Yield per Mou (shih-chin)</u>
100	Ching-ssu (65 mou) Ssu 4B (35 mou)	57,000	570
542	Ching-ssu (395 mou) 517 (40 mou) Ssu 4B (107 mou)	164,768	304
160 (alkali soil)	Ching-ssu (130 mou) Ssu 4B (30 mou)	14,400	90
20 (experimental)	Ching-ssu	1,671	835

2. Technical Experimental

This experiment involved 19 mou. The total production was 10,000 shih-chin of unginned cotton, averaging 526 shih-chin per mou. The breakdown is as follows:

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<u>Size of Plot (mou)</u>	<u>Type</u>	<u>Total Production (shih-chin)</u>	<u>Per Mou (shih-chin)</u>
1.08 (irrigated)	Ching-ssu Ssu 4B	1,027 (unginned)	947
1.6 (irrigated)	Ssu 2B		890 (unginned)
2.16 (irrigated, antiaphid experimental plot)	Ssu 4B Ching-ssu 517		676 (unginned)

The total yield of unginned cotton for the 823 mou of the farm under cotton cultivation was 247,839 shih-chin or 301 shih-chin per mou. This was 20 percent over the original goal of 250 shih-chin per mou and 158.6 percent over the 1952 production of 116.7 shih-chin per mou.

B. Factors in High Production

1. Intensive Cultivation and Increase in Use of Fertilizer

On the Yun-ch'eng State Farm the practice is to deep-plow once, shallow-plow twice, and harrow five times in order to thoroughly pulverize the soil, conserve soil moisture, and improve utilization of organic material in the soil. On experimental plots 4,000 catties of horse manure, 200 catties of cottonseed cake, 100 catties of bone meal, and over 100 catties of ammonium sulfate were applied on 1.08 mou.

2. Seed Selection

Careful seed selection and preparation is practiced.

3. Timely Irrigation

The method used by model cotton grower Ch'u Yao-li, frequent shallow irrigation, has been adopted on this farm with beneficial results.

4. Close Planting

The Yun-ch'eng Farm has adopted the Soviet technique of close planting. In 1951, the average plant density was 2,400 plants per mou with a maximum yield of 400 catties per mou. In 1952, the average was 3,000 plants per mou with yields up to 570 shih-chin for nonirrigated land and from 676 to 928 shih-chin on irrigated land.

5. Antidrought and Triple Thinning Measures

Tamping the seed as it is sown is a good means of fighting dry soil conditions. This method is not new to China, but merits much wider use. Triple thinning results in only the very sturdiest plants being left to produce. On 1.08 mou, specially close planting was practiced by spacing plants one-third meter apart each way. This resulted in having 4,181 plants on one mou. The yield was 928 catties of unginned cotton per mou. With proper attention to irrigation methods and the growing season this yield could be increased to 1,400-1,500 catties per mou.

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6. Timely Antiaphid Measures

During 1952, the Yun-ch'eng Farm sprayed for aphids as often as six or seven times in the most seriously affected spots.

C. Future Plans

1. The Yun-ch'eng Farm will continue to use and promote the use of 517, Ssu 4B, and Ching-ssu type seeds.
2. Cotton acreage on the farm will be increased from 823 mou in 1952 to 1,000 mou in 1953. One hundred mou of nonirrigated land will be irrigated in 1953. Experience has shown that cotton yields on irrigated land are practically double those on nonirrigated land.
3. Deep plowing and increased use of fertilizer will be expanded to the total acreage. Eventually all cotton land will be deep-plowed twice.
4. Close planting will be extended until all cotton acreage on the farm will carry 1,000 more plants per mou than the average in the area. Experimentation will be carried on, directed toward developing a strain of Ssu-tzu cotton that can be close-planted.
5. Ample supplies of antiaphid chemicals are being accumulated to make possible immediate and adequate attack on aphids at their first appearance.
6. Production-per-unit goal for 1953 is 1,000 catties and 600 catties of unginned cotton, respectively for irrigated and nonirrigated land.

III. CONDITIONS ON SHUANG-CH'IAO EXPERIMENTAL FARM

The Shuang-ch'iao Experimental Farm is operated by the Farm Machinery School which is directly controlled by the Ministry of Agriculture. It is located about 30 li from Peiping, at the market town of Shuang-ch'iao, in T'ung-hsien, Hopeh. It has a total area of 2,700 mou of which 1,940 mou is arable land, the rest being occupied with buildings, ditches, roads, etc.

Since 1950, the farm has been particularly concerned with cotton culture and animal husbandry, both as an instructional feature and as an example for several tens of other state-operated mechanized farms. An area of 1,800 mou of land is now being rotated between cotton and pasture. Some 140 mou is being planted in a protective timber belt around the boundaries of the farm as a forestry experimentation project. The farm is operated directly by the Ministry of Agriculture with the aid of Soviet agricultural experts.

In 1951, the average cotton yield on 944 mou of nonirrigated land was 296 catties per mou, an advance of 80 percent over 1950 and 180 percent above private farmers' production in the area. This success is attributed to adoption of the Soviet techniques of close planting, deep plowing, increased use of fertilizer, and pruning. In 1951, the plant density was 3,600 per mou.

Cotton production on the Shuang-ch'iao farm in 1949, the first year of its establishment, was 34 catties per mou. Personnel that year were unconvinced of the superiority of Soviet techniques.

In 1950, the density of plants was raised from 1,500 per mou to 2,500 per mou. Production rose to 163 catties of unginned cotton per mou. In 1951, 30 mou were set aside for experimentation with ten different densities of planting. Results showed that whenever 4,500-5,500 cotton plants per mou were planted 380 catties or more per mou could be harvested.

STAT

The project for 1952 is to increase this figure to 450 catties per mou on nonirrigated land and 1,000 catties on irrigated land. Improved methods of plowing and better use of fertilizers when combined with close planting will make possible this higher increase.

Beginning in 1952, the experimental farm will follow the advanced Soviet methods of crop rotation. The area under cultivation will be divided into six sections, three planted to cotton and three to grass for pasture and green fodder. When the planting of trees is added this combination of agriculture and animal husbandry, the soil can be basically enriched and the climate changed with guarantee of abundant future harvests.

On this experimental farm many changes in methods have increased cotton production during 1949, 1950, and 1951. In 1949, old methods of cultivation produced only 34 catties per mou. In the fall of 1949, deeper plowing up to a depth of 19 centimeters was practiced. In 1950, with the close planting of 2,500 plants per mou, the yield was 163 catties per mou. In the winter of 1950, the ground was plowed to a depth of 20 centimeters and in the next spring 1951 3,600 plants per mou were planted. The average harvest was 296 catties per mou. High production was 537 catties per mou.

The experiment station presents the following production figures for plots where the only difference was in the density of planting.

Plants Per Mou	Yield Per Mou (Shih-chin)
1,500	292.4
2,000	298.3
2,500	309.4
3,000	295.3
3,500	356.2
4,000	365.3
4,500	385.3
5,000	378.6
5,500	383
6,000	370.3

IV. EXPERIMENTAL COTTON PLOT IN HONAN

In the Nan-yang Special Administrative District of Honan Province the cadres used their spare time to experiment with the growing of cotton in a small plot of land, 1.3 mou in area. Their cotton harvest in 1951 averaged 170 catties of ginned cotton per mou.

The activities in which the cadres employed improved techniques were in the preparation of the field, the use of fertilizers, the planting of the cotton, the care of the plants, including replanting and transplanting, the cultivation of the field, the hilling of the plants, pruning, the eradication of insects and prevention of disease, and the warding off of bad effects from drought.

This cotton field proved a valuable model of cotton production for the neighborhood. It is estimated that 30,000 visitors came to inspect it. Some were student delegations but many were regular cotton farmers. The general reaction of the farmers was that when cotton is raised with the proper techniques and with the requisite care and labor 2 mou of cotton will produce enough to take care of all the economic problems of a family of four or five persons.

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