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A Transitional Analysis on the Production of Cereals, Beans and Potatoes in Okayama Prefecture

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The contribution of cereals to economies is undoubtedly very important and has many dimensions in terms of use of cultivated areas, agricultural production, nutrition, domestic and foreign trade and national income. In this study, we examined the characteristics of agricultural production in Okayama prefecture from the viewpoint of grain, beans and potatoes excluding rice, wheat and barley in the long term. These are undoubtedly supposed to have a certain role in complementing the function as the staple food of rice and wheat, etc. Also, according to our literature investigations, researchers have not focused on this context for Okayama Prefecture by not spending enough attention in the past. Therefore, we focus on these subjects in this paper by examining a historical significance. It is observed that some planting area and yield of crops have drastically reduced in Okayama prefecture.

Keywords: *cultivated area, cereals, buckwheat, beans, potatoes, Okayama prefecture*

1 INTRODUCTION

There are many factors that affect agriculture, including agricultural land area, quantity and quality of agricultural labor force, crops and their combinations. In this article, we focus only on the crops among items which have formed agricultural land use in Okayama prefecture. Crops and livestock are very common, but in this paper we restrict to cereals, legumes and potatoes, we do not deal with vegetables, fruit trees, industrial crops, fodder crops and livestock products. Therefore, the aim of the research is to clarify agricultural land use and landscape in Okayama prefecture as seen from basic crops. Next, in the research method, we collect the information which can use long-term statistics and examine the transition of them. In addition, we will present a regional difference in Okayama prefecture of a certain crop at a certain time on a map. Specifically, we analyze the information on crop statistics such as miscellaneous grains, soybean and sweet potato, etc. in a spatio-temporal manner.

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2 CEREALS OTHER THAN RICE, BARLEY AND WHEAT

2.1 Overview

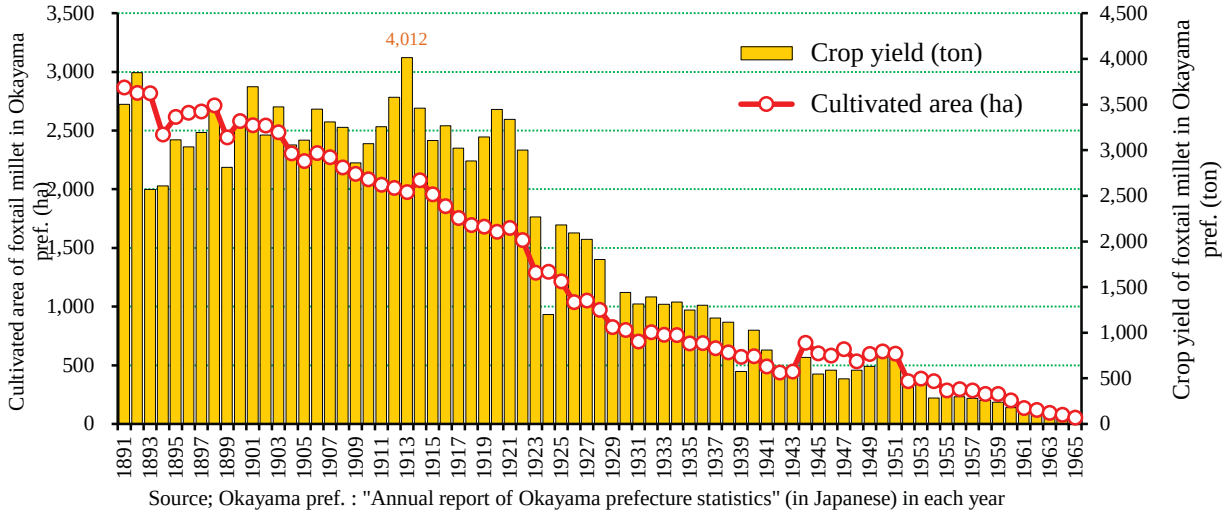
There are various kinds of grains other than rice and barley. Although these are sometimes simply referred to as miscellaneous cereals or grains, they have an important role to supplement the main crops. Also, these definitions are not precisely determined; they include corn, Chinese millet, foxtail millet, barnyard grass, legumes (soybean, red beans (*Adzuki)*, peanut, broad bean, lentil bean, etc.), buckwheat and so on. Since it is necessary to mention the planting area and the harvest volume of the cereals, the other types of cereals of foxtail millet, barnyard grass and Chinese millet are added in the content of the study as well. Foxtail millet had had an area of over 2,000 ha in Okayama pref. until around 1920, but then suddenly started to decline. Chinese millet had maintained an area of 400 ha or more until the first half of the 20th century. Until the 19th century, barnyards grass had retained more than 50 ha, but declined sharply in the 20th century. Buckwheat had kept at the level of 1,500 ha until the 1930s. Although the statistical figures are not recorded afterwards for the former three cereals, only buckwheat is not necessarily annually, but it is also recorded at present. Since all of these are crops that were important to some extent in

the past, it is worth somewhat to just record them carefully.

2.2 Other cereal

2.2.1 Foxtail millet

As a few grains other than rice and wheat, foxtail millet, Chinese millet, barnyard grass, buckwheat and the like can be mentioned. The area of foxtail millet in Okayama pref. is less than 10% of that of rice, barley and wheat. In the oldest 1891 when the records can be obtained, it showed the widest area (2,867 ha), after that it continued to decrease almost uniformly, there is no record after 1966. The acreage area before 1922 was over 1,500 ha. The decrease in acreage area accelerated in the 1920s and continued to decline thereafter. It fell below 500 ha in 1941 and reached 55 ha in 1965. The yield of foxtail millet exceeded 2,500 tons or more by the year 1922, but it has turned to a remarkable decrease after that. It fell below 2,000 tons in 1928, dropped to less than 1,000 tons in 1941, and continued to decline thereafter (**Fig.1**).



Source; Okayama pref. : "Annual report of Okayama prefecture statistics" (in Japanese) in each year

Fig.1 Cultivated area and crop yield of foxtail millet in Okayama prefecture (See **Table 2**)

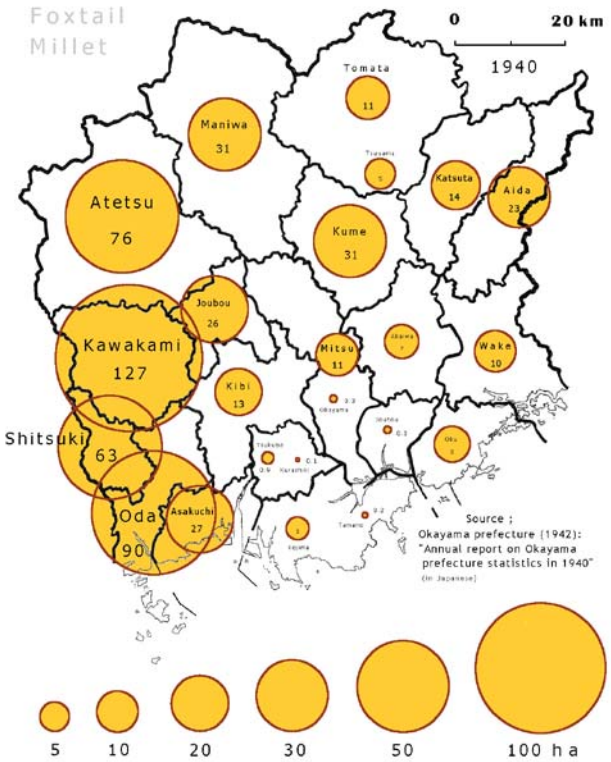


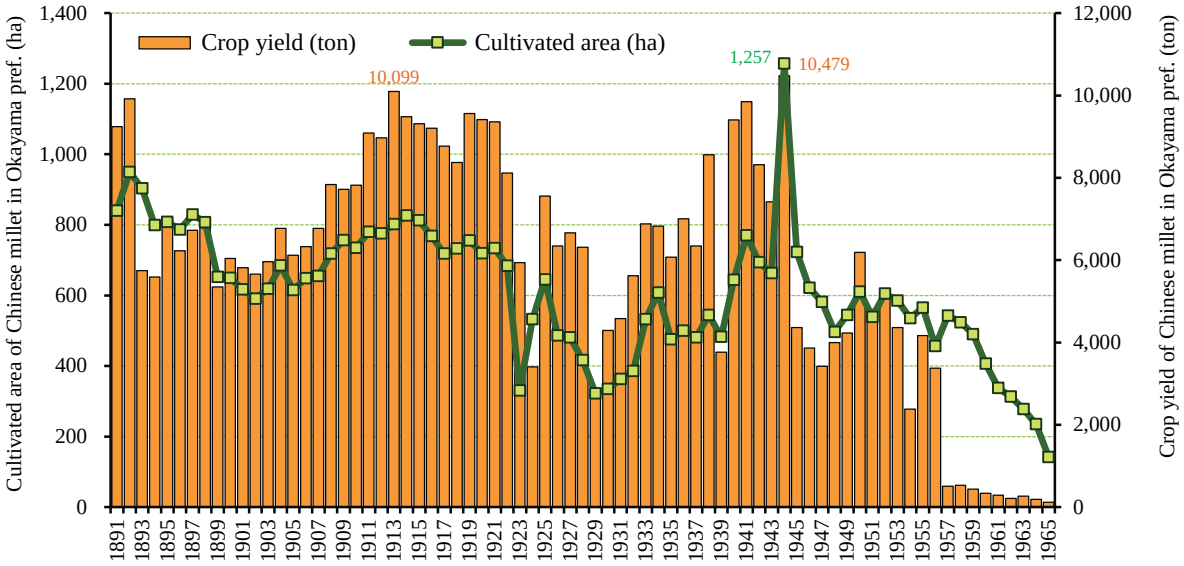
Fig.2 Cultivated area of foxtail millet in Okayama prefecture in 1940 (See **Table 3**)

Source ; Okayama prefecture (1942) : "Annual report on Okayama prefecture statistics in 1940" (in Japanese)

Fig.2 shows the cultivated area of foxtail millet of Okayama prefecture in 1940. As it is obvious at a glance, it was grown widely in the western part of Okayama prefecture. In particular, the area in Kawakami county (127 ha) and Oda county (90 ha) is remarkable. Foxtail millet was also cultivated in the central and eastern part of Okayama pref., but there were considerable differences in comparison with the large area of the western part. Although it is very difficult to explain and point out the reasons for this difference, it was related to the fact that in the western part of Okayama pref. rice cultivation area was small, the rice productivity was quite low and the planting area of wheat was also small. Unlike rice, wheat and barley, there are no statistical data for municipalities in foxtail millet.

2.2.2 Chinese millet

The increase and decrease in the area of Chinese millet had been relatively small until 1922, holding about 700 ha or more, but thereafter remarkable increase and decrease remained about 500 ha until the 1950s. The area of Chinese millet in Okayama pref. has declined sharply since the 1960s. The increase and decrease in Chinese millet yield was remarkable, the period had exceeded 8,000 tons until the 1910s, but it also experienced less than 6,000 tons. Although the increase and decrease in the yield of Chinese millet has expanded since the 1920s, the yield exceeded 10,000 tons in 1944. Decline in the yield of Chinese millet was remarkable after World War II, no record has been reported after 1966 (**Fig.3**). **Fig.4** shows cultivated area of Chinese millet by county in Okayama pref. in 1940. Chinese millet was widely cultivated in the counties in southwestern and northwestern parts of Okayama pref. Asakuchi county (172 ha) and Oda county (142 ha) had particularly large acreage area. In Tamano city, cereals such as foxtail millet, Chinese millet, pearl barley and buckwheat, etc. are cultivated as special products in order to promote regional revitalization and utilization of paddy field.



Source; Okayama pref. : "Annual report of Okayama prefecture statistics" (in Japanese) in each year

Fig.3 Cultivated area and crop yield of Chinese millet in Okayama prefecture (See **Table 4**)

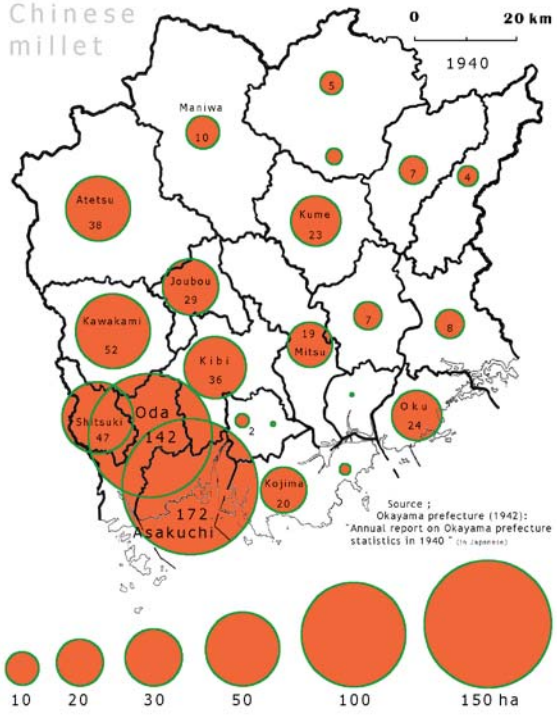
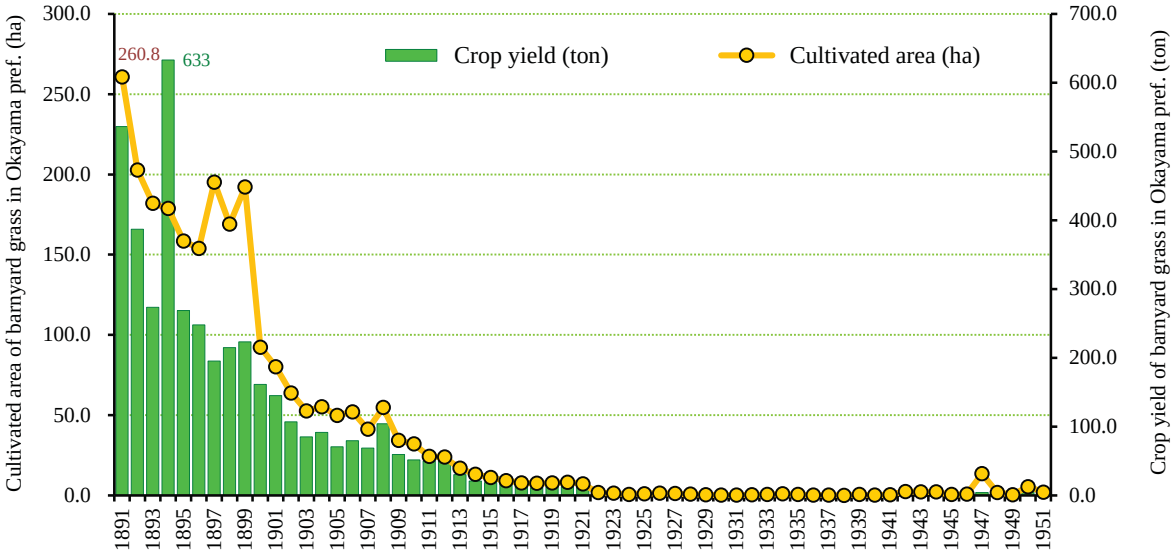


Fig.4 Cultivated area of Chinese millet by county in Okayama prefecture in 1940 (See **Table 5**)

Source ; Okayama prefecture (1942) : "Annual report on Okayama prefecture statistics in 1940" (in Japanese)

2.2.3 Barnyard grass

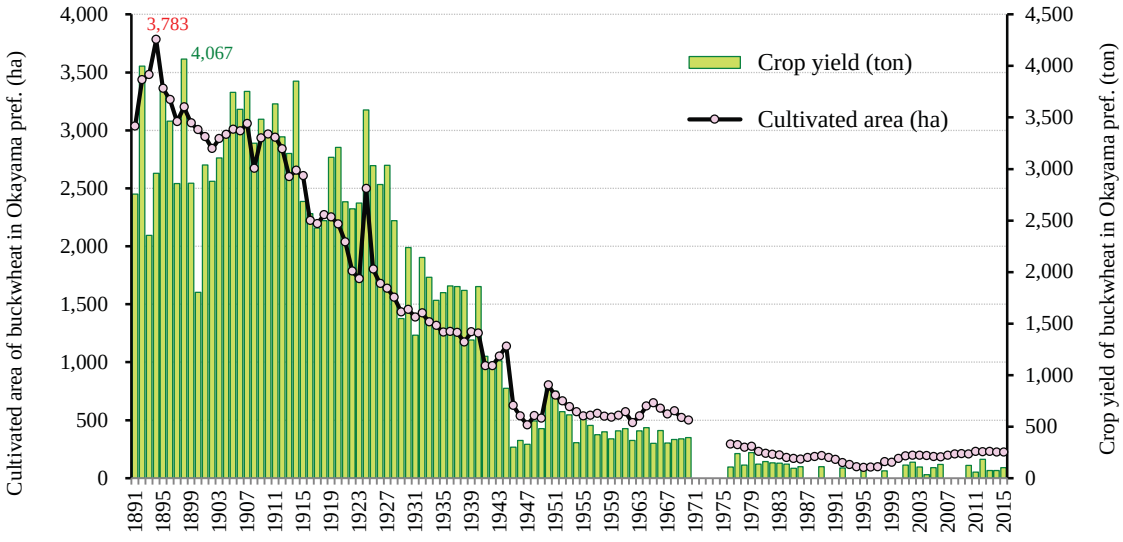
When compared with foxtail millet and Chinese millet, barnyard grass is a rare grain with less area and yield scale. We collected the production records of barnyard grass since the end of the 19th century. As it is clearly seen from **Fig.5,** at the end of the 19th century, barnyard grasses had been planted in over 200 ha in Okayama pref., but it decreased to less than 100 ha after the 20th century and the decrease continued further. Barnyard grass rarely recorded a yield of 500 tons or more at the end of the 19th century, after that, it followed the same change as the cultivation area of barnyard grass. Statistical data for each county of barnyard grass had been published in tabular form from the end of the 19th century to the beginning of the 20th century, but it is not presented here specifically.



Source; Okayama pref. : "Annual report of Okayama prefecture statistics" (in Japanese) in each year

Fig.5 Cultivated area and crop yield of barnyard grass in Okayama prefecture (See **Table 6)**

2.2.4 Buckwheat



Source; Okayama pref. : "Annual report of Okayama prefecture statistics" (in Japanese) in each year

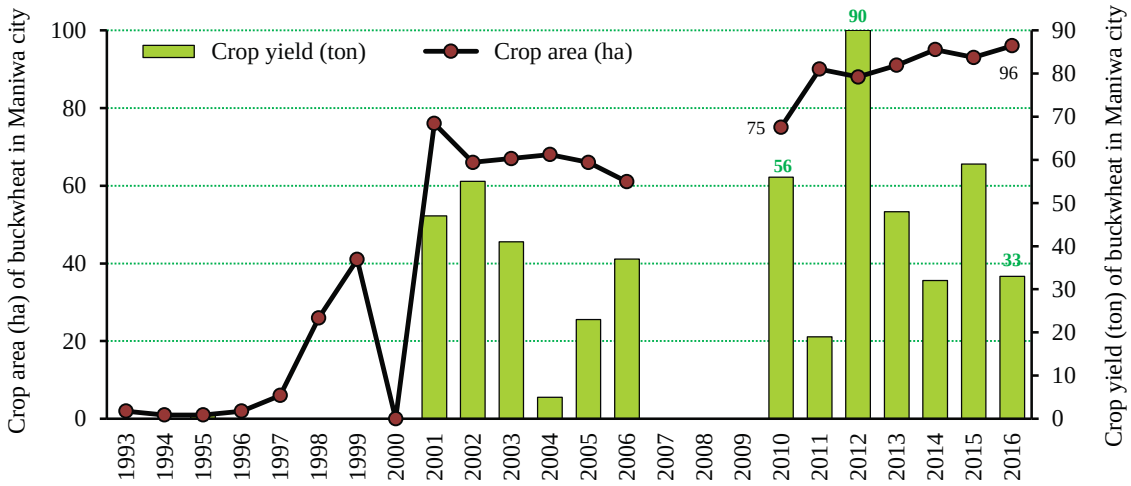
Fig.6 Cultivated area and crop yield of buckwheat in Okayama prefecture (See **Table 7** and **Table 8**)

The cultivated area of buckwheat in Okayama pref. increased at the end of the 19th century and showed 3,783 hectares in 1894, but thereafter it decreased almost consistently. The yield of buckwheat until 1928 remained above 2,500 tons, reaching 4,067 tons in 1898. Buckwheat yield decreased in the 1930s, which declined even further after the 1940s (**Fig.6**). Despite the fact that the planting area and yield of buckwheat have decreased, its production statistics continue to be recorded. In the Hiruzen area of Maniwa city, buckwheat has been cultivated as a

transformation of rice from 1997 using the temperature difference of day and night and good drainage. In 2017, 109 farm households grow buckwheat with about 62 hectares. Sowing is at the end of July; it began to bloom from the end of Aug. and bloomed in Sept. The harvest starts from the beginning of Oct. and the estimated harvest is about 50 tons. In mid-Oct., new buckwheat noodles arrived at the stores.

In Okayama pref., since buckwheat is planted in the Hiruzen area of Maniwa city (formerly, Kawakami village), field survey was conducted in Sept. 2017. In the scenic view, in Hiruzen area, restaurants, forests, meadows, paddy field (there were rice fields both before and after harvesting) for tourists are conspicuous, and buckwheat cultivated in paddy fields is not noticeable. In 2015 agricultural census, 92 farm households out of 140 ha of buckwheat in Okayama pref. cultivated 58 ha (41%) in the former Kawakami village (88 farm households and 50 ha in 2010). However, in the cultivation area of crops of the same village, rice is planted in 86 ha (133 farm households), the area of Japanese radish which the 44 farm households grow was unpublished. The cultivation area of buckwheat per farm households is only about 0.5 ha, not necessarily being gathered in one place, and it is not always widely cultivated. In fact, it is expected that the plantation sites of buckwheat are dispersedly distributed for each small area. **Fig.7** is a photograph of the cultivation area of buckwheat near Nawa-shiro Bridge, which is located upstream of the Nawa-shiro River.

Fig.7 Buckwheat (*Fagopyrum esculentum*) cultivation in paddy field of the Hiruzen-kamifukuda area of Maniwa City on Sept. 18, 2017



Source; Ministry of Agriculture, Forestry and Fisheries : Statistical survey of specific crops
Note: Prior to 2005, the total of number of 9 municipalities before the merger is displayed.

Fig.8 Crop area and yield of buckwheat in Maniwa city after 1993 (See **Table 9**)

Fig.8 depicts crop area and yield of buckwheat in Maniwa city after 1993. The planted area of buckwheat increased dramatically in 2001, continuing to increase in the 2010s, reaching 96 hectares in 2016. On the other hand, the harvest volume of buckwheat had a remarkable increase and decrease, but the yield was around 50 tons in general. **Fig.9** shows cultivated area of buckwheat by county in Okayama prefecture in 1898. Buckwheat was cultivated anywhere in Okayama pref., but it was planted especially widely in the southwestern part (456 ha in Oda county and 406 ha in Kawakami county). The area of buckwheat was 3,201 ha in Okayama pref. in 1898, but in 1932 it decreased markedly to 1,422 ha (**Fig. 10**). Buckwheat was still widely grown in the western and southwestern counties such as Kawakami county (330 ha) and Oda county (211 ha).

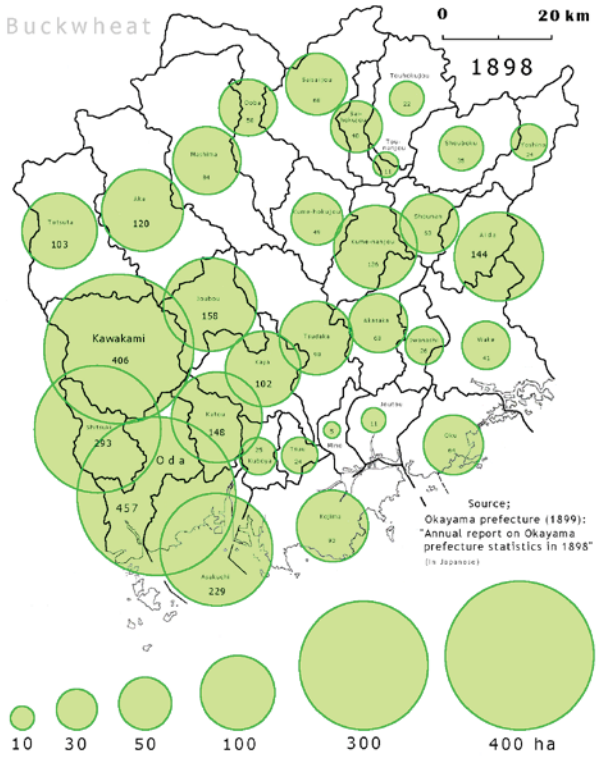


Fig.9 Cultivated area of buckwheat by county in Okayama prefecture in 1898 (See **Table 10**)

Source ; Okayama prefecture (1899) : "Annual report on Okayama prefecture statistics in 1898" (in Japanese)

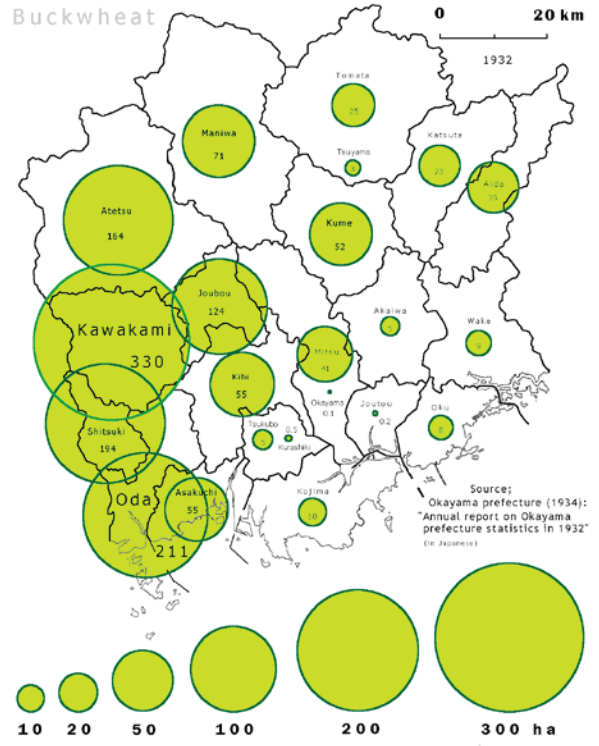


Fig.10 Cultivated area of buckwheat by county in Okayama prefecture in 1932 (See **Table 11**)

Source ; Okayama prefecture (1934) : "Annual report on Okayama prefecture statistics in 1932" (in Japanese)

3 BEANS

3.1 Soybeans

Pulse crops are cereals belonging to the legume family and may not be considered necessarily the main food. However, they are valuable as ancillary ingredients to enrich the dining table. Typical beans include peanut, soybean, pea, broad bean, green bean, cowpea and the like; however, we will focus on soybeans and red beans, which are often listed in agricultural statistics.

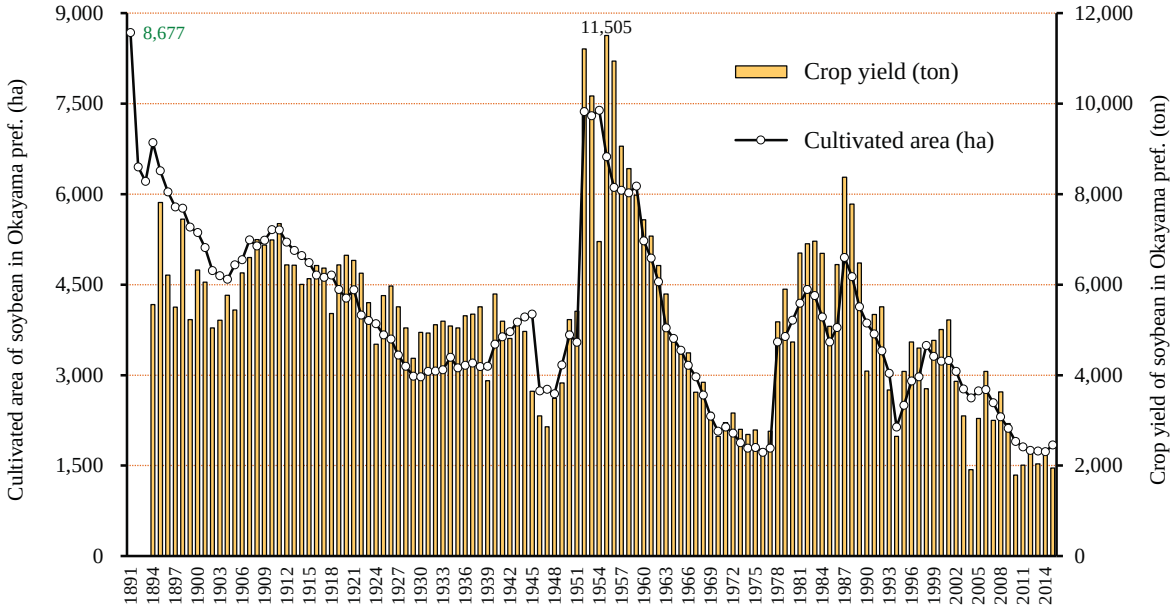
For soybeans, we present the following a few researches. Ogishima (2016) carefully arranged the measures for promoting soybean production in Hokuriku district. Sakamoto et al. (2017) conducted a questionnaire survey of community-based farming corporations in Hiroshima pref. As a result, the unit yield of soybean was lower owing to farm conditions and fewer labor resources in the mountainous area. Also, it turned out that the yield of soybean was greatly affected by soil improvement, possibility of crop rotation, acreage area, soil with high drainage quality.

Yamamoto (1988) delicately detailed the development of the production and distribution of black bean in Ohara Town, Okayama pref. Tamba black bean was introduced in this area in the 1970s and was designated as a crop conversion substitute for rice. In addition, the agricultural cooperative of Ohara Town signed a cultivation contract incorporating the minimum guaranteed price with a miscellaneous grain merchant in Hyogo pref. in 1980.

In 1983 farmers changed to agricultural cooperatives to commission all work (drying, threshing, selection, adjustment, bagging and shipping) after soybean harvesting, so production conditions and quality of soybean improved and production volume also increased.

Fig.11 depicts long-term changes in the planting area and yield of soybeans in Okayama prefecture. In statistical figures, several waves of increase and decrease are seen, but the numerical values are largely decreasing in the long term. About 10 years after the Second World War, the cultivation area of soybeans had increased sharply, but then suddenly declined. Since the late 1970s, the area of soybeans had increased due to the rice conversion promotion policy. However, since the 1990s, the area of soybeans has further declined. The yield of soybeans was slightly decreasing before the Second World War, but there was no major change. After the war, soybeans yield almost corresponds to changes in its cultivation area.

Fig.12 shows the distribution of soybean area by municipality in Okayama pref. in 1955. Soybeans was cultivated throughout Okayama pref., but it is common in inland areas. Regions growing soybeans widely included Takahashi (381 ha), Niimi (350 ha), Kamogawa (278 ha), Tsuyama (267 ha), Ochiai (239 ha), Souja (216 ha), Kasaoka (213 ha), Kayou (211 ha) , Ihara (202 ha) and so on.



Source; Okayama pref. : "Annual report of Okayama prefecture statistics" (in Japanese) in each year

Fig.11 Cultivated area and crop yield of soybeans in Okayama prefecture (See **Table 12**)

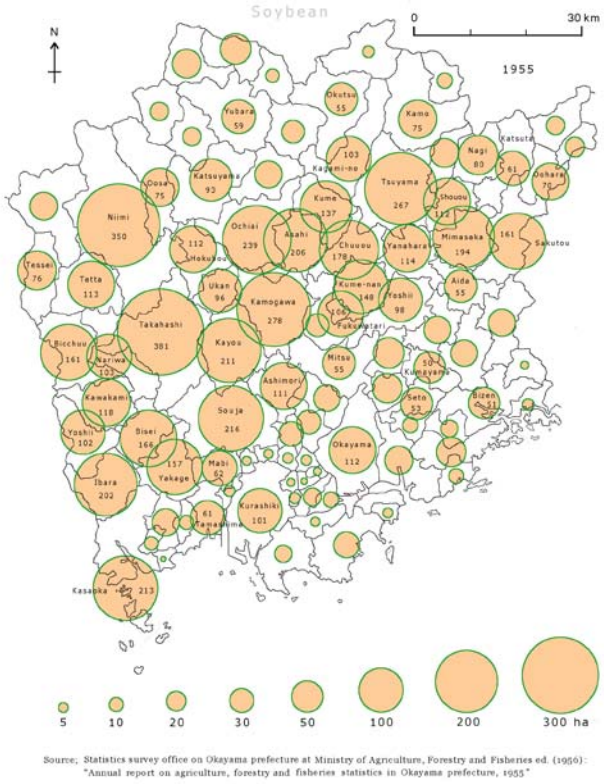


Fig.12 Cultivated area and crop yield of soybeans by municipality in Okayama prefecture in 1955 (See **Table 13**)
Source ; Okayama prefecture (1957) : "Annual report on Okayama prefecture statistics in 1955" (in Japanese)

Fig.13 Cultivation of soybeans in the Uetsuki-higashi area of Shouou-cho photographed on Aug. 27, 2017

Fig. 13 shows the cultivation landscape of soybeans in Shouou Town located in the northeastern part of Okayama prefecture. As can be easily imagined from nearby land use, it is clear that soybean is a transformation of rice.

Black soybeans in the northeastern part of the prefecture are now notoriously renowned in Okayama pref. to a certain extent, however, in the middle of the 20th century soybean was not a special product. We will review the history of soybean cultivation in this area as follows. Native soybean varieties were cultivated to complement the farmer's management from about 1965 as "private cooked beans". With the implementation of production adjustment of rice in 1970, soybean cultivation began with the introduction of soybean varieties "Tamba Black" which was produced in the Tanba-Sasayama region of Hyogo prefecture. This is because the natural environment in the northeastern part of Okayama pref. and the middle and east parts of Hyogo pref. was similar due to the large temperature difference between day and night, and the demand for black soybean was increasing. The cultivation area of black soybeans gradually increased with

the re-strengthening of the production adjustment relating to the transformation of paddy rice in 1995. A large black soybean produced in the northeastern part of Okayama pref. was named "Sakushuu Black" in 1996, differentiated and aimed for branding.

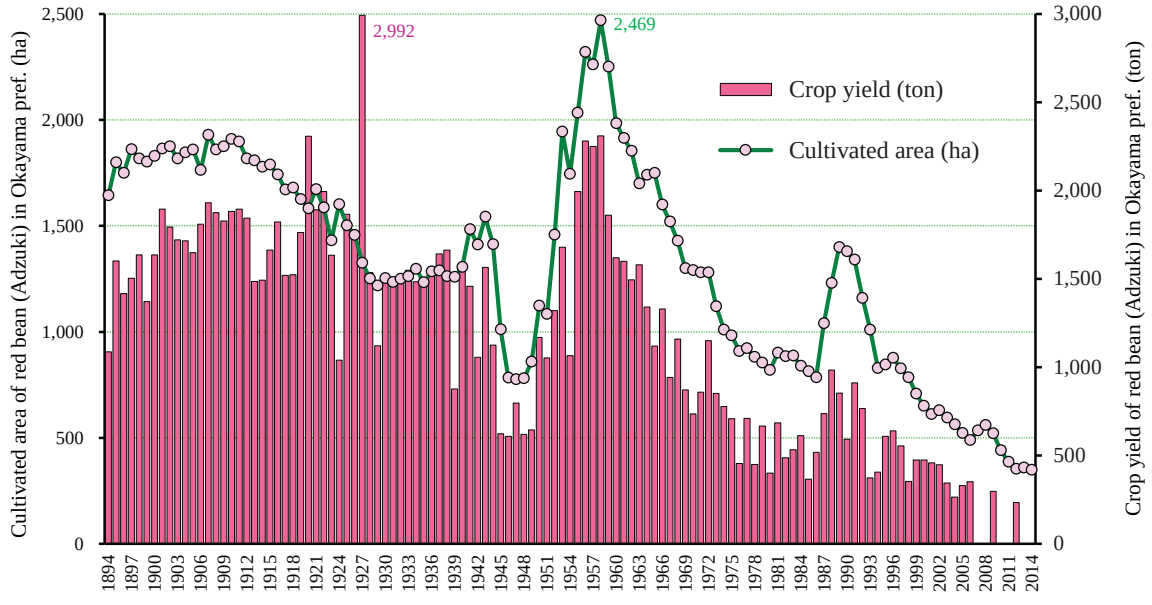
In the production of large black soybeans, the adjustment work of the soil of the field is fundamental. For adjustment of soil, it is important to introduce compost (around January), pH adjustment of soil, improvement of breathability, and drainage measures. Many farmers entrust fertilizer application to Agri Spot Okayama which has an office in Shouou-cho.

Sowing and transplanting is carried out after the soil adjustment work. In order to harvest many black beans of high quality stably, seedlings are transplanted and cultivated. Buckwheat is sowed on the tray after June 15, and seedlings are transplanted from late June to early July. Black beans bloom in mid Aug. and change to bean shape in early October. After that, the maturation progresses slowly, and the harvest is from the end of Nov. to the beginning of December. At this time the leaves turned yellow and began to fall naturally. During the harvest time, the bean's sheath turns brown.

The harvest of black soybeans requires a lot of time and effort, usually about three weeks. Machines are used for harvesting ordinary soybeans, but when black soybeans are harvested on a machine the quality declines. Therefore, the grown beanstalk is cut with a sickle or pulled out of the ground manually. It takes slow work to harvest black soybeans. Otherwise black soybeans will dry quickly, beans will shrink and wrinkles will be made, so the value of the commodity will fall. Sufficiently dried black soybeans are taken out from the pods of the beans. In the shedding work, sticks and stepping threshing machines were used in the past, but now a shedding machine called thresher is used.

In recent years, harvested beans are sold not only as black soybeans but also as *Edamame*. Black soybean standard is divided into 3L, 2L, L, M and S. Beans harvested in the period from early to mid Oct. are sold as *Edamame*. Agri spot Okayama is managed by investment from Shouou-cho, Agricultural Cooperative Association, about 30 dairy farms. Cow dung and rice husk are mixed in the sub centers of the four districts of the town, after which they are collected in the main center and fermented over 3 to 4 months.

Tama-homare was adopted in Nov. 1980, Toyo-shirome in March 1989 and Sachi-yutaka in 2001 as a variety of soybean encouraging varieties. In 2013, Sachi-yutaka was planted with 320 ha, Toyo-shirome in 177 ha in Okayama prefecture.



Source ; Okayama pref. : "Annual report of Okayama prefecture statistics" (in Japanese) in each year

Fig.14 Cultivated and crop yield of red beans (*Adzuki*) in Okayama prefecture (See **Table 14**)

3.2 Red beans (*Adzuki*)

The cultivation area of *Adzuki* in Okayama pref. had exceeded 1,000 ha until the early 1960s except for the period of the World War II (**Fig. 14**). In addition, it increased about four times in the period of more than 10 years after the war, and recorded 2,469 ha in 1958. But then, it declined sharply back to its original level in the first half of the 1980s. Although it temporarily increased around 1990, it has continued to decline since then, and it has been less than 400 ha since the 2010s. The change tendency of the harvest amount of red beans (*Adzuki*) generally seems to correspond to that of the cultivated area, but it decreases in the long term. In the latter half of the 1950s, it showed more than 2,000 tons, but recently it fell below 300 tons, and statistics are not

necessarily announced annually.

However, Okayama pref. is still the major production area of *Adzuki* in western Japan, with a share of approximately 1% to Japan. In particular, the rare variety, "Bicchuu white Adzuki" produced in Okayama pref. is used as a raw material for white sweets for high class Japanese sweets are famous. *Adzuki* cultivation is found in almost all areas of Okayama pref., sowing is in the middle and the end of July, flowering season is Sept., harvesting period is November. Red beans (*Adzuki*) reaches maturity in Nov., but the flowering period is long, and variability of pod maturity is large even in the same strain. For this reason, it is harvested by hand picking, separated from mature pods in about 3 turns.

In 1995, *Adzuki* was cultivated in Okayama pref. at 845 ha, of which 376 ha was planted in paddy fields. The harvest was 608 tons, of which 271 tons were harvested in paddy fields. The main production areas of *Adzuki* are Kasaoka City, Takahashi City, Niimi City and so on. In 2012, *Adzuki* was cultivated in Okayama pref. at 354 ha, and the harvest was 234 tons. *Adzuki* is produced in almost all areas of Okayama pref. and the representative variety is the New Bicchuu-dai-nagon.

Fig.15 shows cultivated area and crop yield of red beans (*Adzuki*) by municipality in Okayama prefecture in 1988. *Adzuki* is cultivated in most places, but in particular it has a wide cultivated area in the inland region. For example, cultivated areas in Niimi (115 ha), Takahashi (67 ha), Kayou (79 ha), Shouou (56 ha), Sakutou (54 ha) and so on are remarkable.

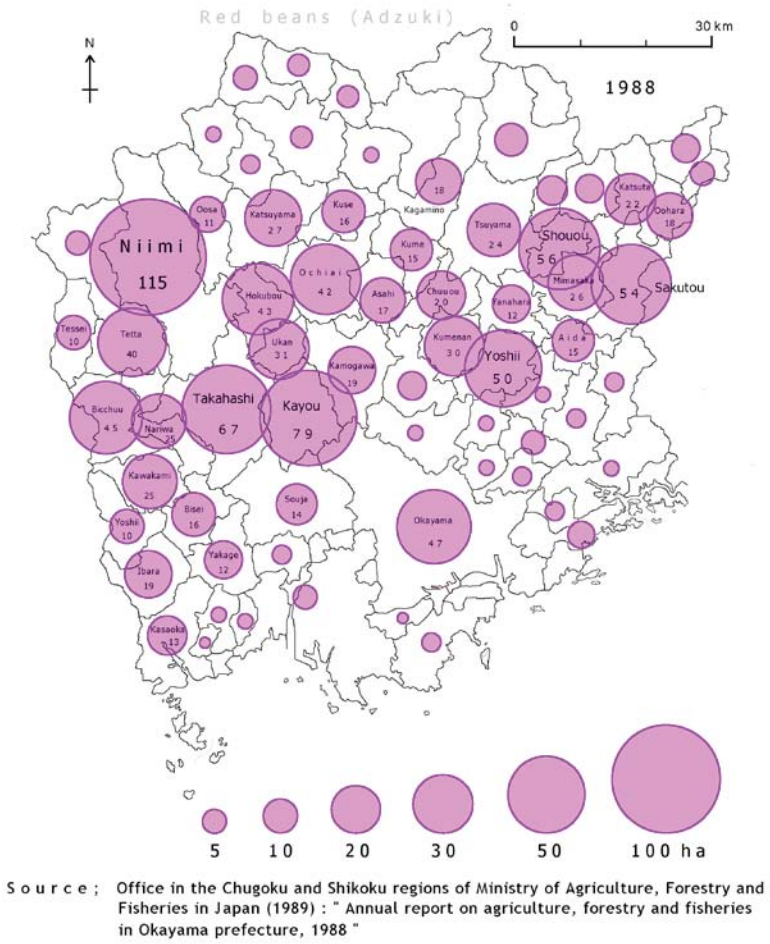


Fig.15 Cultivated area and crop yield of red beans (*Adzuki*) by municipality in Okayama prefecture in 1988 (See **Table 15**)

Source ; Office in the Chugoku and Shikoku regions of Ministry of Agriculture, Forestry and Fisheries in Japan (1989)

"Annual report of agriculture, forestry and fisheries in Okayama Prefecture, 1988"

4 POTATOES

4.1 Potato

Types of potatoes are roughly divided into the following seven types; potato, taro, sweet potato, yam, konnyaku potato, chrysanthemum potato and apios; however, sweet potato and potato are usually recorded in agriculture statistics.

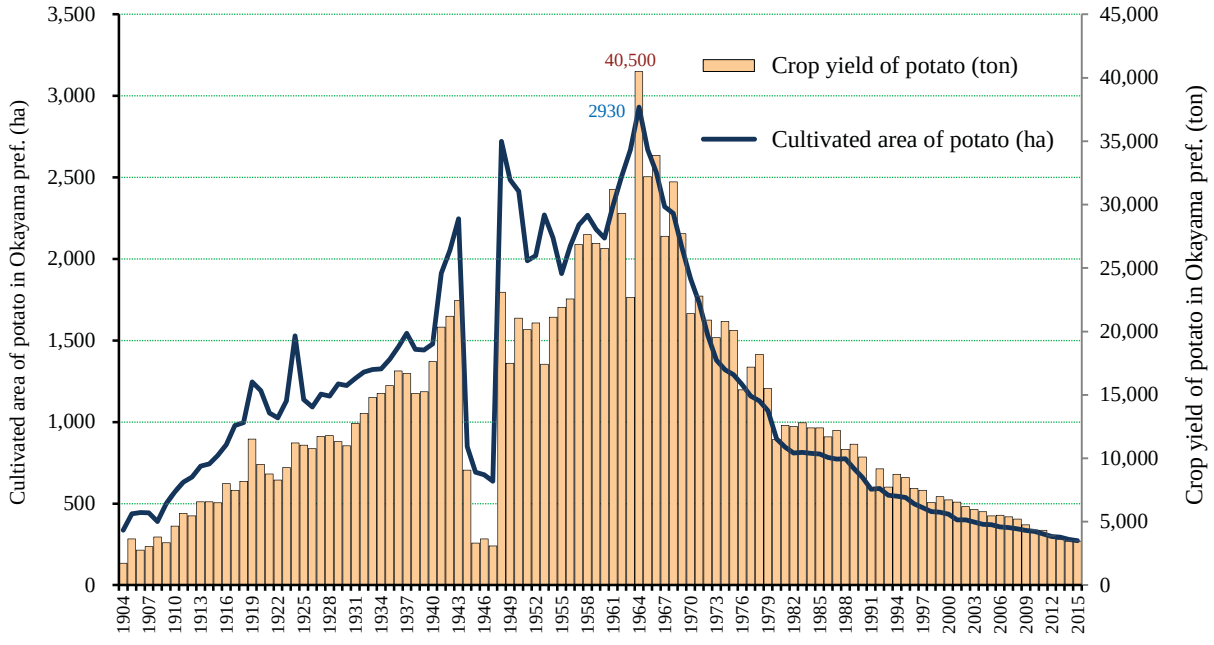
In previous studies on potato cultivation, Kawai et al. (1981) selected potato varieties (Dejima, Danshaku-imo, Nourin No. 1) including Seto-yutaka, and cultivated them in autumn of 1974 in the spring of 1976. They empirically compared the taste, content components, appearance of potatoes, premature nature, the possibility of growing twice a year, in a few municipalities in Okayama prefecture. The

result is quite complicated, so it is difficult to explain briefly, but it turned out that the characteristics of Seto-yutaka are generally superior. In addition, Nakadai (2017) reported that potatoes were cultivated along with pastoralists raising cattle, swine, sheep, and chickens in the mountain village where the elevation of Carpathian mountains in Romania was 900 - 1150 m.

Fig.16 shows cultivated area and crop yield of potatoes in Okayama prefecture. The area and yield of potatoes in Okayama pref. had increased roughly until 1964, but after that it changed to a consistent declining trend. This transition is a fairly simple change. As is well known, potatoes are notorious for relief crops in Europe. Yields in high mountains and cold areas will fall, but potatoes can grow on disadvantaged farmlands. Why was the turning point of potato production in Japan in 1964? It is generally understood that 1964 was the height of the growth of the Japanese economy, and the Olympics was held in Tokyo as one of its symbol. However, it should be noted that Fig.16 represents potato production in Okayama prefecture, not in Japan. This should be noted, but it should be a way of thinking to be helpful. During the period of 1944-1947, only the autumn planting potatoes were recorded, and the values of the potatoes planted in the spring were not recorded, so both the planting area and the crop yield were reduced.

In 1994, there was Dejima and Seto-yutaka, a potato encouraging varieties in Okayama prefecture. Also, in 2006 potatoes, the spring planting was 274 ha and the autumn planting was 83 ha. In spring, 88 ha of Danshaku-imo, 87 ha of May Queen. 55 ha of Dejima and 25 ha of Andean red, etc. were cultivated, and the main producing regions were Okayama City, Kurashiki City and Tsuyama City. In autumn planting, Dejima (53 ha), Andean Red (13 ha), Oojiro (11 ha) etc. were cultivated, and the main cultivated area was Setouchi City.

Fig.17 shows cultivated area of potato by municipality in Okayama prefecture in 1955. Potatoes are grown everywhere in Okayama pref. Bias in the cultivated areas is relatively small but slightly less in the northern part, slightly more in the central and southern parts. For example, Okayama (65 ha), Kurashiki (54 ha), Tsuyama (55 ha), Kasaoka (79 ha), Saidaiji (66 ha), Ibara (58 ha), Takahashi (59 ha), Ushimado (78 ha) and Oku (73 ha), etc. are raised as municipalities with wide potato acreage area.



Source; Okayama pref. : "Annual report of Okayama prefecture statistics" (in Japanese) in each year

Fig.16 Cultivated area and crop yield of potatoes in Okayama prefecture (See **Table 16**)

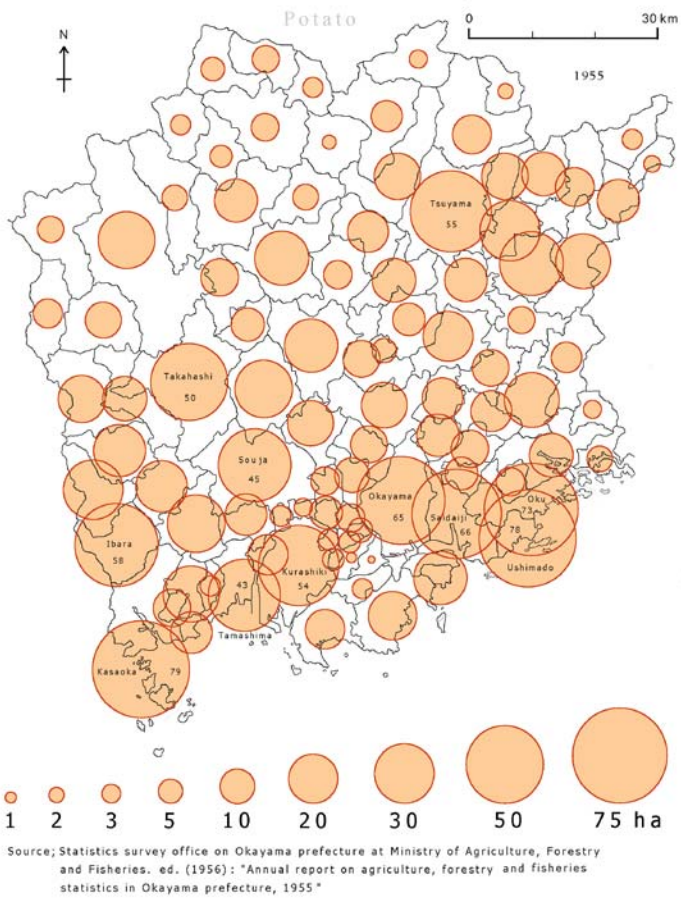


Fig.17 Cultivated area of potato by municipality in Okayama prefecture in 1955 (See **Table 17**)

4.2 Sweet potato

As Nihei et al. (2000) also pointed out; the study of sweet potatoes from a geographical point of view is rare. Nihei et al. (2000) investigated sweet potato (dried sweet potato) production in Hitachinaka-shi, Ibaraki prefecture, explaining that the management of farmers around 1930 was typical of combination of rice, wheat and sweet potato. Recently, Tama-yutaka varieties for processing and Veni-azuma for raw eating are produced.

Yoshida et al. (2011) investigated the land use of the hills in Kuroiwa settlement in Ashikita-machi, Kumamoto pref., and reported that the slash-and-burn field was once dominant, and barley, sweet potato, buckwheat and barnyard grass, etc. were cultivated for self-support, however, it shrank from the 1960's and the slash-and-burn field could not be seen in the early 1980's.

Fujinaga (2015) investigated the daily activities in the Aden area of Kikai-jima in Kagoshima pref. around 1930 and explained that rice, wheat, sweet potato, etc. were cultivated in addition to the product crop, sugarcane.

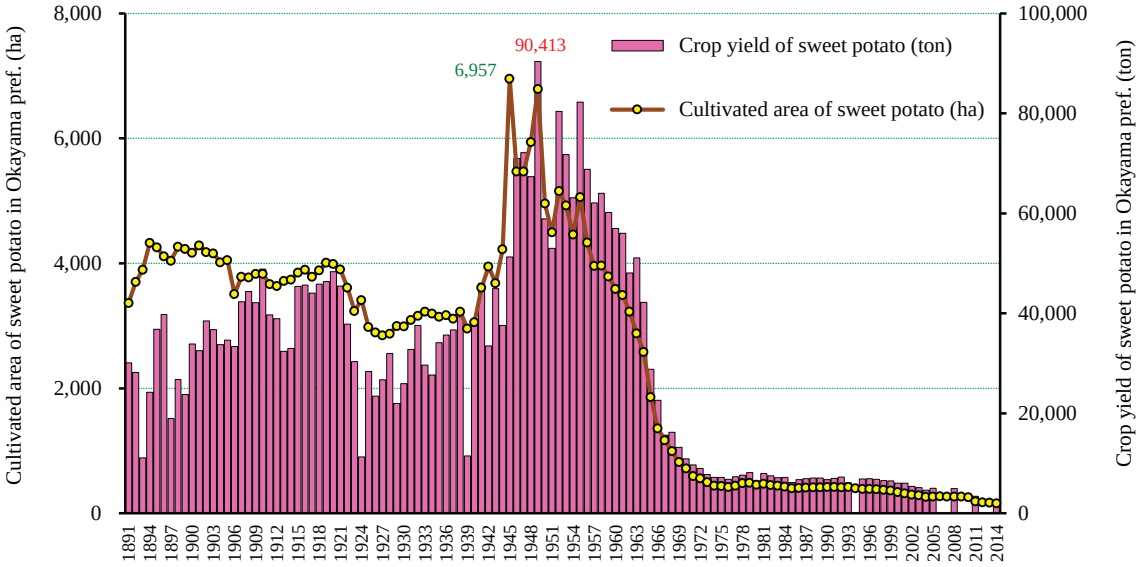
Fig.18 shows cultivated area and crop yield of sweet potatoes in Okayama prefecture. Until the first half of the 20th century, the acreage area of sweet potatoes in Okayama pref. was about 4,000 ha, but due to the food crisis during the Second World War the area increased rapidly and it was 6,957 ha in 1945. After that, the acreage area of sweet potatoes sharply declined and fell to less than 1,000 ha in 1968. The cultivated area continued to decrease slightly afterwards, and it was 162 ha in 2014. The amount of sweet potatoes harvested with vertical bars roughly corresponds to the trend of acreage area. However, in the first half of the 20th century, annually few harvests occur occasionally (e.g., 1892, 1924 and 1939).

In 2006, 272 ha of sweet potatoes was planted in Okayama pref., the main varieties were Koukei No.14 (248 ha) and Beniaka (8 ha) and the main producing regions were Okayama City and Kurashiki City. Koukei No. 14 was selected and cultivated as an early harvest variety in 1945 at the agricultural experiment site in Kochi prefecture.

Fig.19 depicts cultivated area of sweet potato by municipality in Okayama pref. in 1955. In 1955, sweet potato was cultivated throughout Okayama pref., but it can be thought that there are some central areas of cultivation. The first is the southwestern part, the second is the northeastern part developed in the eastern part of Tsuyama City, and the third is the Setouchi coastal region from Kojima City to the vicinity of Oku-cho.

Regarding sweet potato cultivation area in southwestern part, Kasaoka City (7,470 ha), Ibara City (2,430 ha), Yakage Town (1,225 ha), Tamashima City (1,775 ha) and Takahashi city (1,090 ha), etc. were wide. In the northeastern part, Tsuyama City (1,290 ha), Shouou Town (826 ha), Nagi Town (623 ha) and Mimasaka Town (603 ha), etc. were the core

areas of cultivation. In addition, sweet potato was grown widely even in Kojima city (1,558 ha), Touji Town (1,150 ha), Okayama City (907 ha), Saidaiji City (775 ha), Ushimado Town (1,128 ha) and Oku Town (1,117 ha), etc. in the southern part of the prefecture.



Source; Okayama pref. : "Annual report of Okayama prefecture statistics" (in Japanese) in each year

Fig.18 Cultivated area and crop yield of sweet potatoes in Okayama prefecture (See **Table 18**)

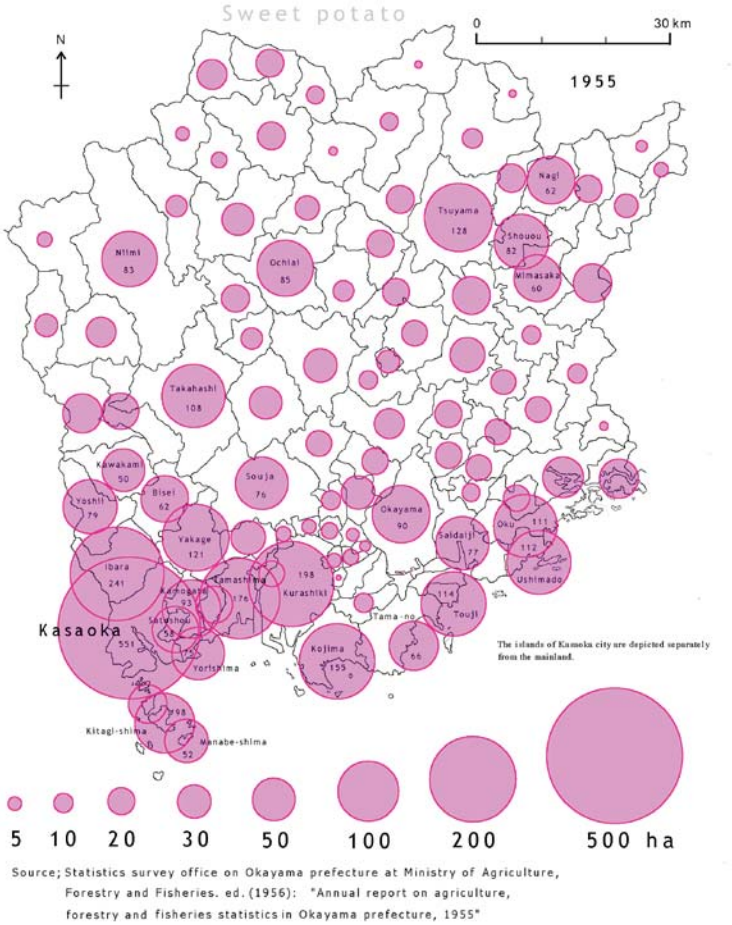


Fig.19 Cultivated area of sweet potato by municipality in Okayama prefecture in 1955 (See **Table 17**)

5 CONCLUDING REMARKS

The changes and developments of cultivated area and yield of several grains, beans and potatoes in Okayama prefecture have a long history for more than a century. Foxtail millet had maintained a certain area until around 1920, but had gradually decreased since the 1920s, and any statistics have not been published since the mid of 1960s. Changes in the area of Chinese millet were similar to Foxtail millets, but it declined sharply in the mid of 1950s and the statistics of Chinese millet have not been announced since the mid of 1960s. The decrease in the area of Barnyard grass has continued since the beginning of the 20th century and the statistic of it have not been published since 1952. Buckwheat also declined sharply in the first half of the 20th century. It has been advertised as one of the elements of a healthy diet menu since the second half of the 20th century and continues to be produced in a small area. The area of beans such as soybean and *Adzuki* began to decrease slightly but it did not decrease remarkably like miscellaneous grains. The demand for potatoes such as sweet potatoes and potatoes is somewhat similar to that of beans.

The ratio of harvested farmers (or farm households) of sweet potatoes was 85% in 1960, which seems to have complemented the role of staple rice sufficiently. However, the ratio declined to 25% in 1970, the number of farmers growing sweet potatoes subsequently decreased sharply, and in 2000 it was only about 2,000. The rate of farmer to harvest potatoes also maintained a high ratio of 89% in 1960, but after that it followed a similar trend to sweet potatoes, and the number of cultivated farmers declined to about 3,500 in 2000. The rate of farmers to harvest soybean was relatively high at 74% in 1950, however, it continued to decrease gradually after that, reaching 12% in 2000. The harvest farmer's rate of red beans (*Adzuki*) was 46% in 1950, but it gradually decreased, and it was not reported on its own after 1990. In general, the cultivation of bean / potatoes, which are field crops, has remarkably diminished since the second half of the 20th century (**Table 1**). Finally, there can be many economic, social and climatic factors that can affect agricultural developments in Okayama pref., however, it is clear that the number of producers, farm households of beans and potatoes planting area and yield of crops in Okayama pref. have drastically reduced since the last several decades.

Table 1 Number of harvest farm households of main potatoes and beans and its ratio in Okayama prefecture

Year		**Total** number of farm households	Number of harvest farm households and its ratio			
			Sweet potato	Potato	Soybean	Red bean
1950	**Number** of farm households	177,078			131,876	80,587
	Percentage to total farm households				**74**	**46**
1960	**Number** of farm households	172,533	147,476	153,332	92,578	59,209
	Percentage to total farm households		**85**	**89**	**54**	**34**
1970	**Number** of farm households	154,081	38,651	83,655	53,910	43,611
	Percentage to total farm households		**25**	**54**	**35**	**28**
1980	**Number** of farm households	134,799	19,963	49,264	51,291	25,048
	Percentage to total farm households		**15**	**37**	**38**	**19**
1990	**Number** of farm households	110,451	12,834	27,811	35,351	
	Percentage to total farm households		**12**	**25**	**32**	
2000	**Number** of farm households	90,053	2,050	3,502	10,883	
	Percentage to total farm households		**2.3**	**3.9**	**12**	

Note; In the case of 2000, it is not the number of harvest farm households, but the number of planted farm houseiholds.

Source ; Ministry of Agriculture, Forestry and Fisheries in Japan : " Census of world agriculture " in each year

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Appendices:

Table 2 Cultivated area (ha) and crop yield (ton) of foxtail millet in Okayama prefecture

Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)
1891	2,867	3,502	1916	1,857	3,266	1941	492	810
1892	2,822	3,850	1917	1,757	3,021	1942	439	610
1893	2,818	2,570	1918	1,695	2,880	1943	448	613
1894	2,468	2,608	1919	1,683	3,143	1944	694	731
1895	2,617	3,113	1920	1,638	3,446	1945	602	548
1896	2,654	3,035	1921	1,671	3,337	1946	585	590
1897	2,664	3,195	1922	1,569	3,002	1947	637	496
1898	2,717	3,459	1923	1,290	2,267	1948	535	589
1899	2,442	2,812	1924	1,297	1,198	1949	597	630
1900	2,582	3,307	1925	1,217	2,179	1950	620	828
1901	2,545	3,695	1926	1,040	2,093	1951	601	784
1902	2,544	3,166	1927	1,052	2,024	1952	367	435
1903	2,486	3,476	1928	973	1,802	1953	387	435
1904	2,307	3,058	1929	827	1,027	1954	367	285
1905	2,241	3,108	1930	802	1,442	1955	288	315
1906	2,308	3,448	1931	704	1,314	1956	298	300
1907	2,274	3,309	1932	783	1,390	1957	288	280
1908	2,187	3,249	1933	762	1,311	1958	257	260
1909	2,132	2,860	1934	758	1,336	1959	258	240
1910	2,085	3,072	1935	686	1,248	1960	202	180
1911	2,039	3,256	1936	690	1,302	1961	137	120
1912	2,013	3,580	1937	645	1,161	1962	120	106
1913	1,976	4,012	1938	610	1,116	1963	96	93
1914	2,076	3,461	1939	574	573	1964	78	64
1915	1,957	3,108	1940	578	1,027	The maximum values are indicated by red numbers.		

Source ; Okayama pref. : "Annual report of Okayama prefecture statistics"

Table 3 Cultivation of foxtail millet by county in Okayama prefecture in 1940

County name	Cultivated area (ha)	Crop yield (ton)
Okayama	0.30	0.3
Kurashiki	0.10	0.15
Tsuyama	5.45	9.15
Tamano	0.20	0.3
Mitsu	10.51	16.5
Akaiwa	6.74	10.7
Wake	10.12	16.4
Oku	7.64	14.4
Joutou	0.30	0.6
Kojima	3.07	4.05
Tsukubo	0.89	1.05
Asakuchi	26.78	60.9
Oda	90.45	220.1
Shitsuki	63.07	147.3
Kibi	12.79	21.15
Joubou	26.18	33.6
Kawakami	127.24	225.8
Atetsu	75.77	105.6
Maniwa	31.34	39.6
Tomata	10.91	13.8
Katsuta	14.08	16.35
Aida	22.71	33.9
Kume	31.04	35.85

Source ; Okayama prefecture (1942) : "Annual report on Okayama prefecture statistics in 1940"

Table 4 Cultivated area (ha) and crop yield (ton) of Chinese millet in Okayama prefecture

Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)
1891	840	9,240	1916	768	9,201	1941	770	9,852
1892	950	9,916	1917	718	8,770	1942	694	8,320
1893	903	5,749	1918	733	8,373	1943	663	7,414
1894	799	5,589	1919	756	9,559	1944	1,257	10,479
1895	808	7,014	1920	719	9,413	1945	723	4,365
1896	787	6,230	1921	734	9,360	1946	622	3,866
1897	829	6,728	1922	684	8,118	1947	581	3,423
1898	808	6,786	1923	331	5,943	1948	496	3,994
1899	653	5,349	1924	532	3,408	1949	545	4,227
1900	649	6,038	1925	645	7,553	1950	611	6,189
1901	617	5,813	1926	486	6,345	1951	539	4,805
1902	591	5,664	1927	481	6,660	1952	605	5,256
1903	618	5,964	1928	416	6,313	1953	585	4,364
1904	685	6,773	1929	322	2,725	1954	536	2,380
1905	615	6,118	1930	335	4,290	1955	565	4,165
1906	649	6,331	1931	363	4,579	1956	456	3,372
1907	655	6,775	1932	386	5,625	1957	543	510
1908	718	7,837	1933	532	6,883	1958	524	533
1909	757	7,718	1934	608	6,825	1959	490	440
1910	735	7,823	1935	476	6,071	1960	407	340
1911	780	9,084	1936	499	7,004	1961	337	290
1912	776	8,975	1937	481	6,341	1962	313	215
1913	802	10,099	1938	544	8,559	1963	278	270
1914	826	9,485	1939	482	3,765	1964	235	190
1915	813	9,316	1940	644	9,406	1965	142	115

The maximum values are indicated by red numbers.

Source ; Okayama pref. : "Annual report of Okayama prefecture statistics"

Table 5 Cultivation of Chinese millet by county in Okayama prefecture in 1940

County name	Chinese millet (ha)	Chinese millet (ton)
Okayama	0	0
Kurashiki	0.20	0.3
Tsuyama	2.38	3.75
Tamano	1.19	1.8
Mitsu	18.55	34.5
Akaiwa	7.24	12.75
Wake	7.74	13.95
Oku	23.40	40.65
Joutou	0.10	0.3
Kojima	19.54	32.85
Tsukubo	1.79	2.1
Asakuchi	170.48	428.85
Oda	141.12	376.35
Shitsuki	46.91	112.95
Kibi	35.80	72
Joubou	28.66	48.75
Kawakami	51.17	95.1
Atetsu	38.08	78.3
Maniwa	10.21	16.05
Tomata	4.76	6.6
Katsuta	7.34	9.45
Aida	3.97	7.5
Kume	23.21	27.75
Source ; Okayama prefecture (1942) : "Annual report on Okayama prefecture statistics in 1940"		

Table 6 Cultivated area (ha) and crop yield (ton) of barnyard grass in Okayama prefecture

Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)
1891	260.8	536.3	1922	1.7	3.5
1892	202.7	387	1923	1.3	2.6
1893	181.9	273.3	1924	0.6	1.1
1894	178.8	633	1925	1.0	1.8
1895	158.4	269.0	1926	1.4	2.1
1896	153.9	247.7	1927	1.1	2.3
1897	195.2	195	1928	0.8	1.2
1898	169.0	215.0	1929	0.3	0.6
1899	192.1	223.1	1930	0.1	0.2
1900	92.3	161.3	1931	0.2	0.5
1901	80.1	145.1	1932	0.3	0.5
1902	63.8	106.8	1933	0.5	0.6
1903	52.6	84.9	1934	0.9	1.5
1904	55.2	91.5	1935	0.5	0.9
1905	49.8	70.4	1936	0.1	0.2
1906	52.0	79.2	1937	0.1	0.2
1907	41.2	68.7	1938	-	
1908	54.7	103.8	1939	0.5	0.6
1909	34.1	59.6	1940	0.1	0.3
1910	32.0	51.3	1941	0.4	0.2
1911	24.3	49.4	1942	2.4	3.8
1912	23.8	53.6	1943	2.2	3.8
1913	16.9	30.0	1944	2.1	3.2
1914	13.1	20.9	1945	0.5	0.5
1915	11.0	18.3	1946	0.7	1.8
1916	9.1	18.2	1947	13.4	3.9
1917	7.7	17.4	1948	1.8	1.8
1918	7.4	11.1	1949	0.4	0.5
1919	7.6	18.3	1950	5.4	7.2
1920	8.1	12.3	1951	2.0	2.4
1921	7.1	12.9	The maximum values are indicated by red numbers.		

Source ; Okayama pref. : "Annual report of Okayama prefecture statistics"

Table 7 Cultivated area (ha) and crop yield (ton) of buckwheat in Okayama prefecture

Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)
1891	3,035	2,757	1933	1,347	1,950	1975		
1892	3,435	3,999	1934	1,315	1,724	1976	293	108
1893	3,480	2,354	1935	1,258	1,799	1977	287	238
1894	3,783	2,960	1936	1,263	1,865	1978	263	126
1895	3,362	3,813	1937	1,254	1,860	1979	273	248
1896	3,265	3,463	1938	1,173	1,823	1980	229	137
1897	3,074	2,860	1939	1,260	1,341	1981	213	162
1898	3,201	4,067	1940	1,250	1,858	1982	204	149
1899	3,063	2,861	1941	968	1,182	1983	199	145
1900	3,004	1,802	1942	968	1,076	1984	175	137
1901	2,945	3,038	1943	1,050	1,137	1985	167	94
1902	2,842	2,881	1944	1,137	873	1986	162	110
1903	2,927	3,106	1945	625	302	1987	177	
1904	2,964	3,353	1946	534	366	1988	184	
1905	3,009	3,743	1947	459	329	1989	193	112
1906	2,993	3,580	1948	537	556	1990	175	
1907	3,057	3,752	1949	516	480	1991	158	
1908	2,670	3,249	1950	803	903	1992	131	100
1909	2,934	3,483	1951	714	845	1993	114	
1910	2,967	3,357	1952	663	645	1994	97	
1911	2,940	3,633	1953	615	615	1995	89	76
1912	2,841	3,312	1954	570	345	1996	94	
1913	2,599	3,150	1955	536	570	1997	96	
1914	2,653	3,851	1956	541	510	1998	141	72
1915	2,607	2,684	1957	556	420	1999	135	
1916	2,220	2,568	1958	532	450	2000	167	
1917	2,192	2,426	1959	523	380	2001	189	127
1918	2,271	2,498	1960	540	460	2002	194	153
1919	2,251	3,115	1961	569	480	2003	194	107
1920	2,191	3,210	1962	478	366	2004	192	33
1921	2,037	2,682	1963	534	460	2005	184	101
1922	1,784	2,614	1964	620	490	2006	181	134
1923	1,719	2,669	1965	649	337	2007	196	-
1924	2,497	3,572	1966	600	462	2008	207	-
1925	1,801	3,034	1967	550	341	2009	208	-
1926	1,677	2,848	1968	578	376	2010	206	124
1927	1,637	3,035	1969	522	381	2011	228	57
1928	1,558	2,498	1970	498	393	2012	226	181
1929	1,433	1,549	1971			2013	228	75
1930	1,453	2,239	1972			2014	223	74
1931	1,388	1,386	1973			2015	224	103
1932	1,422	2,141	1974			The maximum values are indicated		
						by red numbers.		

Source ; Okayama pref. : "Annual report of Okayama prefecture statistics"

Table 8 Cultivated area (ha) and crop yield (ton) of buckwheat in Okayama prefecture, 2010-2016

	Crop area (ha) of buckwheat in Okayama prefecture							Crop yield (ton) of buckwheat in Okayama prefecture							
Municipality / Year	2010	2011	2012	2013	2014	2015	2016	Municipality / Year	2010	2011	2012	2013	2014	2015	2016
Okayama-shi	4	3	3	2	2	2	2	Okayama-shi	2	2	2	0	1	1	1
Kurashiki-shi	0	x	x	x	x	x	x	Kurashiki-shi	...	x	x	x	x	x	x
Tsuyama-shi	6	9	5	8	9	7	6	Tsuyama-shi	2	2	4	1	3	5	1
Tamano-shi	0	x	x	1	1	1	1	Tamano-shi	...	x	x	0	0	0	0
Kasaoka-shi	0	x	x	x	x	x	x	Kasaoka-shi	...	x	x	x	x	x	x
Ibara-shi	8	8	10	9	7	7	6	Ibara-shi	7	4	8	4	3	3	2
Soja-shi	2	x	2	2	2	2	2	Soja-shi	2	x	1	0	0	0	0
Takahashi-shi	12	12	12	11	10	10	11	Takahashi-shi	11	8	10	4	4	4	4
Niimi-shi	22	23	22	27	21	22	31	Niimi-shi	18	7	18	6	7	12	9
Bizen-shi	1	1	x	x	x	x	x	Bizen-shi	1	0	x	x	x	x	x
Setouchi-shi	0	x	x	x	x	x	x	Setouchi-shi	...	x	x	x	x	x	x
Akaiwa-shi	1	1	1	2	1	1	1	Akaiwa-shi	1	0	1	0	0	0	0
Maniwa-shi	75	90	88	91	95	93	96	Maniwa-shi	56	19	90	48	32	59	33
Mimasaka-shi	35	31	28	26	23	23	16	Mimasaka-shi	8	4	16	2	10	4	4
Asakuchi-shi	0	x	x	x	x	x	x	Asakuchi-shi	...	x	x	x	x	x	x
Wake-cho	3	3	2	2	2	2	2	Wake-cho	2	1	1	0	1	1	1
Hayashima-cho	-	-	-	-	-	-	x	Hayashima-cho	-	-	-	-	-	-	x
Satosho-cho	-	-	-	-	-	x	x	Satosho-cho	-	-	-	-	-	x	x
Yakage-cho	0	x	1	1	1	1	1	Yakage-cho	...	x	1	0	0	0	0
Shinjo-son	x	x	x	x	0	x	x	Shinjo-son	x	x	x	x	…	x	x
Kagamino-cho	3	6	6	6	4	4	4	Kagamino-cho	1	1	2	1	1	1	1
Shoo-cho	2	x	x	2	2	2	2	Shoo-cho	1	x	x	0	0	0	0
Nagi-cho	x	x	x	x	x	14	12	Nagi-cho	x	x	x	x	x	7	4
Nishiawakura-son	x	0	x	x	0	0	x	Nishiawakura-son	x	…	x	x	…	…	x
Kumenan-cho	2	2	5	5	5	3	3	Kumenan-cho	1	1	3	1	1	1	1
Misaki-cho	19	18	19	20	19	20	19	Misaki-cho	3	2	9	5	3	3	3
Kibichuo-cho	4	3	5	5	8	9	12	Kibichuo-cho	3	1	3	1	1	2	2
Total	206	228	226	228	223	224	229	Total	124	57	181	75	74	103	66

0 ; less than a unit x; for secret protection x; concealed numerical value = ; not applicable … ; facts unknown, or lacks facts

Source ; Statistical survey of specific crops

Table 9 Cultivated area (ha) and crop yield (ton) of buckwheat in Maniwa-shi, 1993-2016

	Crop area (ha) of buckwheat in Maniwa-shi										Crop yield (ton) of buckwheat in Maniwa-shi									
Year	Hokubou	Katsuyama	Ochiai	Yubara	Kuse	Mikamo	Kawakami	Yatsuka	Chuka	Maniwa-shi	Year	Hokubou	Katsuyama	Ochiai	Yubara	Kuse	Mikamo	Kawakami	Yatsuka	Chuka	Maniwa-shi
1993	2	0	0	0	0	0	0	0	0	2	1993	-	-	-	-	-	-	-	-	-	-
1994	1	0	0	0	0	-	0	0	0	1	1994	...	...	...	...	...	-	...	...	...	...
1995	1	0	0	0	0	0	0	0	0	1	1995	1	0	0	0	0	0	0	0	0	1
1996	1	0	0	0	0	0	0	1	0	2	1996	...	...	...	...	...	...	...	...	...	...
1997	1	0	0	0	1	1	2	1	0	6	1997	...	...	...	...	...	...	...	...	...	...
1998	1	0	1	4	0	2	17	1	0	26	1998	...	...	...	...	...	...	...	...	...	...
1999	1	0	2	11	0	3	23	1	0	41	1999	...	...	...	...	...	...	...	...	...	...
2000	...	...	...	...	...	...	...	...	...	...	2000	...	...	...	...	...	...	...	...	...	...
2001	1	1	2	25	0	3	43	1	0	76	2001	1	1	1	16	0	2	25	1	0	47
2002	1	1	2	16	0	3	42	1	0	66	2002	1	1	2	13	0	2	35	1	0	55
2003	1	1	1	15	0	3	46	0	0	67	2003	0	1	1	4	0	2	33	0	0	41
2004										68	2004										5
2005										66	2005										23
2006										61	2006										37
2007											2007										
2008											2008										
2009											2009										
2010										75	2010										56
2011										90	2011										19
2012										88	2012										90
2013										91	2013										48
2014										95	2014										32
2015										93	2015										59
2016										96	2016										33

0 ; less than a unit x; for secret protection, confidential numbers = ; not applicable … ; facts unknown, or lacks facts

Source ; Statistical survey of specific crops

Table 10 Cultivation of buckwheat in Okayama prefecture in 1898

Name of city and county	Buckwheat (ha)	Buckwheat (ton)
Okayama	0.00	0
Mino	4.76	4.65
Tsudaka	98.18	98.25
Akasaka	62.88	84.9
Iwanashi	26.18	29.7
Wake	41.16	51.45
Oku	64.26	70.35
Joutou	10.61	10.8
Kojima	93.02	109.05
Tsuu	24.20	17.4
Kuboya	25.09	39.15
Asakuchi	229.49	250.8
Oda	456.60	587.55
Shitsuki	293.45	341.1
Katou	148.26	303.3
Kaya	102.35	103.35
Joubou	158.18	287.1
Kawakami	406.31	675.9
Testuta	103.24	171.75
Aka	119.50	186
Mashima	84.10	106.8
Ooba	57.92	42.45
Saisaijou	68.03	49.65
Saihokujou	48.30	23.85
Tounanjou	11.40	4.5
Touhokujou	21.92	62.1
Shouboku	35.31	20.1
Shounan	62.58	45.75
Yoshino	24.40	26.25
Aida	144.30	112.65
Kume-hokujou	48.99	44.85
Kume-nanjou	125.55	105.9

Source ; Okayama prefecture (1899) : "Statistical report on Okayama prefecture in 1898"

Table 11 Cultivation of buckwheat in Okayama prefecture in 1932

Name of city and county	Buckwheat (ha)	Buckwheat (ton)
Okayama	0.10	0.15
Kurashiki	0.50	0.75
Tsuyama	3.07	3.75
Mitsu	41.16	59.55
Akaiwa	4.66	6.75
Wake	8.53	12.75
Oku	7.64	11.7
Joutou	0.20	0.15
Kojima	10.21	15.15
Tsukubo	5.36	7.5
Asakuchi	55.04	80.7
Oda	210.74	315.6
Shitsuki	194.28	314.25
Kibi	55.14	84.9
Joubou	123.97	184.95
Kawakami	330.25	506.55
Atetsu	164.33	269.85
Maniwa	71.40	86.1
Tomata	25.29	36.45
Katsuta	23.31	31.8
Aida	34.81	43.35
Kume	52.46	68.1

Source ; Okayama prefecture (1934) : "Annual report on Okayama prefecture statistics in 1932"

Table 12 Cultivated area and yield of soybeans in Okayama prefecture

Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)
1891	8,677		1933	3,090	5,192	1975	1,800	2,790
1892	6,447		1934	3,296	5,082	1976	1,720	2,370
1893	6,212		1935	3,122	5,046	1977	1,790	2,760
1894	6,853	5,561	1936	3,163	5,314	1978	3,550	5,180
1895	6,385	7,813	1937	3,198	5,348	1979	3,640	5,900
1896	6,036	6,208	1938	3,139	5,512	1980	3,910	4,730
1897	5,787	5,502	1939	3,148	3,877	1981	4,190	6,700
1898	5,762	7,444	1940	3,511	5,795	1982	4,420	6,900
1899	5,455	5,230	1941	3,636	5,195	1983	4,320	6,960
1900	5,364	6,321	1942	3,721	4,811	1984	3,960	6,690
1901	5,114	6,051	1943	3,876	5,158	1985	3,550	5,080
1902	4,730	5,043	1944	3,964	4,964	1986	3,790	6,440
1903	4,646	5,209	1945	4,009	3,641	1987	4,950	8,370
1904	4,590	5,764	1946	2,739	3,098	1988	4,630	7,780
1905	4,829	5,436	1947	2,762	2,858	1989	4,130	6,480
1906	4,914	6,259	1948	2,689	3,491	1990	3,860	4,090
1907	5,238	6,596	1949	3,168	3,828	1991	3,680	5,340
1908	5,142	6,997	1950	3,665	5,226	1992	3,400	5,510
1909	5,236	6,877	1951	3,543	5,412	1993	3,030	3,670
1910	5,409	6,989	1952	7,369	11,209	1994	2,140	2,650
1911	5,407	7,347	1953	7,299	10,166	1995	2,500	4,080
1912	5,206	6,434	1954	7,388	6,949	1996	2,900	4,730
1913	5,063	6,429	1955	6,619	11,505	1997	2,970	4,600
1914	4,982	6,001	1956	6,109	10,935	1998	3,490	3,700
1915	4,863	6,128	1957	6,060	9,060	1999	3,310	4,770
1916	4,656	6,418	1958	6,020	8,560	2000	3,230	5,010
1917	4,620	6,365	1959	6,129	7,980	2001	3,240	5,220
1918	4,656	5,363	1960	5,227	7,430	2002	3,060	3,860
1919	4,418	6,436	1961	4,939	7,070	2003	2,770	3,100
1920	4,278	6,648	1962	4,547	6,419	2004	2,620	1,910
1921	4,413	6,534	1963	3,780	5,790	2005	2,740	3,040
1922	3,992	6,255	1964	3,610	4,870	2006	2,760	4,080
1923	3,904	5,601	1965	3,410	4,470	2007	2,540	3,000
1924	3,849	4,685	1966	3,160	4,490	2008	2,310	3,630
1925	3,665	5,754	1967	2,970	3,620	2009	2,120	2,930
1926	3,598	5,972	1968	2,670	3,840	2010	1,900	1,790
1927	3,330	5,508	1969	2,320	3,180	2011	1,810	2,010
1928	3,144	5,040	1970	2,070	2,650	2012	1,750	2,310
1929	2,980	4,369	1971	2,140	2,950	2013	1,740	2,040
1930	2,969	4,944	1972	2,040	3,160	2014	1,730	2,370
1931	3,064	4,931	1973	1,880	2,800	2015	1,840	1,950
1932	3,067	5,116	1974	1,790	2,690			

Source; Okayama pref. : "Annual report of Okayama prefecture statistics" in each year

Table 13 Cultivated area of soybeans in Okayama prefecture in 1955

Municipality	Cultivated area (ha)	Municipality	Cultivated area (ha)	Municipality	Cultivated area (ha)
Okayama	112.17	Koujo	15.97	Tetta	112.76
Kurashiki	100.76	Fujita	12.10	Oosa	75.47
Tsuyama	267.37	Nadasaki	4.56	Katsuyama	93.32
Tamano	34.71	Touji	4.86	Ochiai	238.71
Kojima	15.27	Nanaku	0.00	Mikamo	17.45
Tamashima	60.99	Kibi	5.65	Shinjou	17.16
Kasaoka	212.63	Shou	5.36	Kawakami, M.	42.94
Saidaiji	41.85	Chaya	6.64	Yatsuka	48.20
Ibara	201.82	Hayashima	3.07	Chuuka	9.72
Souja	216.40	Senoo	2.08	Yubara	58.81
Takahashi	**380.83**	Fukuda	3.07	Kuse	36.99
Niimi	349.59	Kiyone	4.26	Kagamino	103.34
Ichinomiya	29.65	Yamate	4.56	Tomi	26.88
Tsudaka	35.50	Funao	6.05	Okutsu	55.24
Mitsu	54.94	Konkou	10.21	Kami-saibara	7.24
Takebe	26.98	Kamogata	37.49	Kamo	74.58
Kamogawa	278.48	Satoshou	9.82	Aba	12.60
Sanyou	43.93	Yorishima	1.19	Shouboku	43.24
Akasaka	49.49	Bisei	165.62	Shouou	111.67
Yoshii, A.	98.38	Yakage	156.99	Katsuta	60.69
Kumayama	50.48	Yoshii, S.	101.65	Nagi	79.83
Seto	53.26	Mabi	62.28	Mimasaka	194.08
Bizen	50.58	Takamatsu	31.54	Sakutou	161.06
Hinase	7.34	Ashimori	111.47	Aida	55.14
Mitsuishi	3.07	Ukan	95.80	Oohara	70.02
Yoshinaga	37.59	Kayou	210.84	Higashi-awakura	21.32
Wake	36.40	Hokubou	111.67	Nishi-awakura	17.65
Saeki	37.09	Nariwa	103.24	Kume	137.06
Ushimado	11.31	Kawakami, N.	118.21	Chuuou	177.52
Oku	45.12	Bicchuu	161.36	Asahi	205.59
Osafune	15.67	Singou	38.68	Yanahara	114.25
Joudou	12.00	Tessei	76.07	Kumenan	147.77
				Fuku-watari	106.41

The figures are the sum of dry soybeans and immature soybeans.

Source; Okayama pref. (1957) : "Annual report of Okayama prefecture statistics in 1955"

Table 14 Cultivated area and yield of red beans (Adzuki) in Okayama prefecture

Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)	Year	Cultivated area (ha)	Crop yield (ton)
1894	1,643	1,088	1935	1,233	1,506	1976	909	455
1895	1,800	1,601	1936	1,285	1,567	1977	922	710
1896	1,749	1,416	1937	1,289	1,642	1978	882	450
1897	1,862	1,504	1938	1,263	1,663	1979	854	666
1898	1,818	1,635	1939	1,259	878	1980	819	401
1899	1,802	1,371	1940	1,306	1,553	1981	901	685
1900	1,829	1,635	1941	1,485	1,458	1982	885	487
1901	1,864	1,894	1942	1,411	1,056	1983	887	532
1902	1,875	1,794	1943	1,543	1,565	1984	840	613
1903	1,817	1,721	1944	1,413	1,125	1985	813	366
1904	1,847	1,716	1945	1,012	624	1986	785	518
1905	1,860	1,648	1946	784	608	1987	1,040	738
1906	1,763	1,811	1947	775	796	1988	1,230	984
1907	1,929	1,932	1948	780	620	1989	1,400	854
1908	1,860	1,875	1949	860	645	1990	1,380	593
1909	1,874	1,828	1950	1,123	1,168	1991	1,340	911
1910	1,909	1,882	1951	1,084	1,052	1992	1,160	766
1911	1,897	1,895	1952	1,458	1,320	1993	1,010	374
1912	1,817	1,843	1953	1,944	1,680	1994	829	406
1913	1,808	1,486	1954	1,745	1,065	1995	845	608
1914	1,778	1,493	1955	2,033	1,995	1996	877	640
1915	1,789	1,664	1956	2,321	2,280	1997	828	555
1916	1,742	1,823	1957	2,261	2,250	1998	785	353
1917	1,671	1,520	1958	2,469	2,310	1999	708	474
1918	1,680	1,523	1959	2,251	1,860	2000	650	475
1919	1,626	1,763	1960	1,984	1,620	2001	611	458
1920	1,582	2,307	1961	1,914	1,600	2002	629	447
1921	1,673	1,892	1962	1,853	1,494	2003	595	345
1922	1,587	1,995	1963	1,700	1,580	2004	563	265
1923	1,430	1,633	1964	1,740	1,340	2005	522	329
1924	1,601	1,040	1965	1,750	1,120	2006	489	352
1925	1,502	1,865	1966	1,600	1,330	2007	534	-
1926	1,457	1,764	1967	1,520	942	2008	560	-
1927	1,325	2,992	1968	1,430	1,160	2009	521	297
1928	1,252	1,536	1969	1,300	871	2010	441	-
1929	1,218	1,122	1970	1,290	735	2011	386	-
1930	1,253	1,520	1971	1,280	858	2012	354	234
1931	1,235	1,488	1972	1,280	1,150	2013	359	-
1932	1,250	1,526	1973	1,120	851	2014	349	-
1933	1,262	1,549	1974	1,010	778			
1934	1,297	1,483	1975	983	708			

Source; Okayama pref. : "Annual report of Okayama prefecture statistics" in each year

Table 15 Cultivation of red beans (Adzuki) in Okayama prefecture in 1988

Name of municipality	Planting area (ha)	Crop yield (ton)	Name of municipality	Planting area (ha)	Crop yield (ton)
Okayama	47	39	Houkubou	43	31
Kurashiki	5	5	Kayou	79	57
Tsuyama	24	20	Nariwa	25	21
Tamano	3	2	Kawakami-cho	25	20
Kasaoka	13	10	Bicchuu	45	29
Ibara	19	15	Oosa	11	8
Souja	14	12	Singou	5	3
Takahashi	67	52	Tetta	40	28
Niimi	115	92	Tessei	10	7
Bizen	2	2	Katsuyama	27	18
Mitsu	2	2	Ochiai	42	30
Takebe	7	6	Yubara	4	2
Kamogawa	19	15	Kuse	16	12
Seto	3	3	Mikamo	3	2
Sanyou	2	2	Shinjou	2	1
Akasaka	2	2	Kawakami-son	5	3
Kumayama	5	4	Yatsuka	4	2
Yoshii - Akaiwa	50	49	Chuuka	4	2
Hinase	0	0	Kamo	9	7
Yoshinaga	3	2	Tomi	2	1
Saeki	2	2	Okutsu	5	4
Wake	3	2	Kamisaibara	1	1
Ushimado	0	0	Aba	2	1
Oku	6	5	Kagamino	18	15
Osafune	3	2	Katsuta	22	18
Nadasaki	1	1	Shouou	56	55
Hayashima	0	0	Nagi	7	6
Yamate	0	0	Shouboku	8	7
Kiyone	0	0	Oohara	18	15
Funao	0	0	Higashi-awakura	5	4
Konkou	2	1	Nishi-awakura	7	5
Kamogata	2	1	Mimasaka	26	26
Yorishima	-	-	Sakutou	54	48
Satoshou	1	1	Aida	15	12
Yakage	12	9	Chuuo	20	17
Bisei	16	12	Asahi	17	14
Yoshii - Shitsuki	10	8	Kumenan	30	216
Mabi	3	2	Kume	15	13
Ukan	31	23	Yana-hara	12	10

Source ; Regional office of Chugoku and Shikoku of Ministry of Agriculture, Forestry and Fisheries in Japan (1989) : "Annual report of agriculture, forestry and fisheries statistics of 1988 in Okayama prefecture"

Table 16 Cultivated area and yield of potatoes in Okayama prefecture

Year	Cultivated area (ha)	Yield (ton)	Year	Cultivated area (ha)	Yield (ton)	Year	Cultivated area (ha)	Yield (ton)
1904	337	1,727	1941	1,913	20,339	1978	1,130	18,200
1905	437	3,635	1942	2,053	21,194	1979	1,070	15,500
1906	445	2,774	1943	2,246	22,432	1980	897	11,500
1907	443	3,036	1944	849	9,071	1981	846	12,600
1908	391	3,804	1945	693	3,319	1982	811	12,500
1909	498	3,342	1946	676	3,634	1983	814	12,800
1910	572	4,665	1947	637	3,083	1984	809	12,400
1911	631	5,669	1948	2,722	23,104	1985	805	12,400
1912	664	5,452	1949	2,487	17,489	1986	783	11,700
1913	730	6,580	1950	2,416	21,036	1987	772	12,200
1914	744	6,562	1951	1,990	20,141	1988	774	10,700
1915	795	6,503	1952	2,020	20,681	1989	714	11,100
1916	861	8,012	1953	2,270	17,411	1990	662	10,100
1917	979	7,471	1954	2,130	21,128	1991	589	7,700
1918	996	8,187	1955	1,910	21,907	1992	593	9,160
1919	1,245	11,514	1956	2,080	22,570	1993	552	7,740
1920	1,193	9,509	1957	2,209	26,860	1994	545	8,740
1921	1,056	8,754	1958	2,268	27,630	1995	538	8,480
1922	1,026	8,279	1959	2,181	26,960	1996	499	7,620
1923	1,130	9,269	1960	2,129	26,550	1997	475	7,470
1924	1,528	11,221	1961	2,330	31,200	1998	451	6,530
1925	1,137	11,038	1962	2,510	29,300	1999	448	6,980
1926	1,093	10,751	1963	2,670	22,700	2000	436	6,720
1927	1,172	11,717	1964	2,930	40,500	2001	401	6,550
1928	1,159	11,795	1965	2,670	32,200	2002	400	6,180
1929	1,233	11,305	1966	2,530	33,900	2003	387	5,970
1930	1,225	10,987	1967	2,320	27,500	2004	373	5,800
1931	1,268	12,757	1968	2,280	31,800	2005	371	5,450
1932	1,306	13,543	1969	2,070	27,700	2006	358	5,510
1933	1,322	14,796	1970	1,880	21,400	2007	353	5,380
1934	1,327	15,114	1971	1,730	22,800	2008	345	5,200
1935	1,384	15,727	1972	1,530	20,900	2009	336	4,760
1936	1,463	16,883	1973	1,380	19,500	2010	329	4,340
1937	1,544	16,695	1974	1,320	20,800	2011	314	4,330
1938	1,447	15,113	1975	1,290	20,100	2012	298	3,860
1939	1,441	15,251	1976	1,230	15,400	2013	294	3,590
1940	1,478	17,609	1977	1,160	17,200	2014	280	3,460
						2015	272	3,480

Only potatoes to plant in autumn

Source; Okayama pref. : "Annual report of Okayama prefecture statistics" in each year

Table 17 Cultivation area of potato and sweet potato in Okayama prefecture in 1955

Municipality	Potato (ha)	Sweet potato (ha)	Municipality	Potato (ha)	Sweet potato (ha)
Okayama	65.3	907	Yorishima	14.5	759
Kurashiki	54.0	2,001	Bisei	22.0	624
Tsuyama	55.0	1,290	Yakage	28.6	1,225
Tamano	19.6	666	Yoshi - Shitsuki	29.5	800
Kojima	13.0	1,558	Mabi	14.4	331
Tamashima	43.4	1,775	Takamatsu	6.6	104
Kasaoka	**78.7**	7,470	Ashimori	17.7	179
Saidaiji	66.3	775	Ukan	9.3	122
Ibara	58.0	2,430	Kayou	27.5	294
Souja	44.5	768	Hokubou	11.7	222
Takahashi	49.9	1,090	Nariwa	16.3	366
Niimi	26.9	839	Kawakami - kawakami	22.4	506
Ichi-no-miya	10.2	305	Bicchuu	18.6	419
Tsudaka	11.2	191	Shingou	5.9	59
Mitsu	17.6	245	Tessei	7.2	146
Takebe	11.3	92	Tetta	10.9	249
Kamogawa	23.9	310	Oosa	5.5	127
Sanyou	14.8	193	Katsuyama	15.4	285
Akasaka	13.9	197	Ochiai	24.2	861
Yoshii - Akaiwa	20.6	332	Mikamo	4.1	70
Kumayama	14.1	178	Shinjou	3.3	51
Seto	11.5	181	Kawakami - Maniwa	4.7	247
Bizen	15.8	450	Yatsuka	6.2	215
Hinase	5.5	421	Chuuka	3.3	87
Mitsuishi	2.8	20	Yubara	6.4	210
Yoshinaga	7.7	99	Kuse	5.4	164
Wake	24.8	179	Kagamino	18.0	214
Saeki	11.2	174	Tomi	1.7	21
Ushimado	78.3	1,128	Okutsu	8.2	87
Oku	73.1	1,117	Kami-saibara	2.7	13
Osafune	6.8	195	Kamo	12.6	108
Joutou	9.0	90	Aba	2.0	15
Koujo	0.9	0	Shouboku	18.0	226
Fujita	0.4	0	Shouo	30.5	826
Nadasaki	3.4	100	Katsuta	12.8	200
Touji	23.6	1,150	Nagi	15.9	623
Kibi	6.8	47	Mimasaka	33.9	603
Shou	8.8	74	Sakutou	24.9	409
Chaya	4.0	6	Aida	6.0	91
Hayashima	3.4	53	Ohara	15.0	154
Senoo	4.0	68	Higashi-awakura	2.3	54
Fukuda	5.0	30	Nishi-awakura	3.5	36
Kiyone	3.6	60	Kume	14.2	204
Yamate	2.8	55	Chuuou	16.0	199
Funao	13.7	176	Asahi	6.8	117
Konkou	3.3	374	Yanahara	15.3	383
Kamogata	26.5	933	Kumenan	8.8	175
Satoshou	11.7	585	Fukuwatari	5.0	142

Source ; Statistical survey officeon Okayama prefecture at Ministry of Agriculture, Forestry and Fisheries in Japan ed. (1956) : " Annual report on agriculture, forestry and fisheries statistics in Okayama prefecture, 1955 "

For convenience, the cultivation area of sweet potato in the Kasaoka Islands is included in the statistical figures of Kasaoka City.

Table 18 Cultivated area and yield of sweet potatoes in Okayama prefecture

Year	Cultivated area (ha)	Yield (ton)	Year	Cultivated area (ha)	Yield (ton)	Year	Cultivated area (ha)	Yield (ton)
1891	3,365	30,125	1933	3,226	29,635	1975	435	7,180
1892	3,701	28,204	1934	3,195	27,689	1976	423	6,770
1893	3,898	11,075	1935	3,144	34,151	1977	441	7,320
1894	4,327	24,188	1936	3,171	35,676	1978	484	7,650
1895	4,257	36,810	1937	3,113	36,661	1979	489	8,120
1896	4,111	39,762	1938	3,226	39,340	1980	459	6,470
1897	4,043	18,962	1939	2,954	11,473	1981	472	7,930
1898	4,265	26,784	1940	3,058	37,723	1982	450	7,470
1899	4,229	23,737	1941	3,609	46,030	1983	443	7,090
1900	4,170	33,867	1942	3,950	33,495	1984	424	7,170
1901	4,286	32,558	1943	3,682	44,920	1985	399	6,180
1902	4,182	38,494	1944	4,226	37,575	1986	404	6,710
1903	4,159	36,737	1945	6,957	51,259	1987	409	6,950
1904	4,014	33,770	1946	5,469	71,011	1988	414	7,040
1905	4,051	34,631	1947	5,469	72,178	1989	414	7,040
1906	3,510	33,349	1948	5,943	67,321	1990	420	6,760
1907	3,787	42,303	1949	6,793	90,413	1991	420	7,010
1908	3,776	44,385	1950	4,956	58,917	1992	416	7,240
1909	3,829	42,111	1951	4,498	53,004	1993	419	6,120
1910	3,833	48,835	1952	5,157	80,381	1994	400	
1911	3,669	39,728	1953	4,929	71,798	1995	390	6,860
1912	3,638	38,905	1954	4,463	63,143	1996	392	6,940
1913	3,717	32,405	1955	5,059	82,275	1997	385	6,820
1914	3,737	32,995	1956	4,334	68,835	1998	377	6,560
1915	3,849	45,387	1957	3,957	62,100	1999	365	6,460
1916	3,900	45,639	1958	3,967	64,000	2000	341	6,000
1917	3,783	44,044	1959	3,789	60,200	2001	319	6,000
1918	3,887	45,854	1960	3,590	57,000	2002	297	5,380
1919	4,010	46,348	1961	3,491	56,000	2003	288	5,100
1920	3,992	48,354	1962	3,226	48,112	2004	264	4,620
1921	3,902	45,440	1963	2,880	51,100	2005	267	5,020
1922	3,609	37,862	1964	2,580	42,200	2006	272	-
1923	3,239	30,380	1965	1,860	28,800	2007	267	-
1924	3,413	11,247	1966	1,360	22,600	2008	266	4,970
1925	2,980	28,390	1967	1,170	15,600	2009	266	-
1926	2,894	23,463	1968	993	16,200	2010	259	-
1927	2,846	26,723	1969	820	13,200	2011	192	3,420
1928	2,875	31,933	1970	720	10,900	2012	174	-
1929	2,995	21,950	1971	593	9,670	2013	168	-
1930	2,993	25,963	1972	558	8,980	2014	162	2,480
1931	3,094	32,786	1973	499	7,780			
1932	3,159	37,576	1974	442	7,200			

Source; Okayama pref. : "Annual report of Okayama prefecture statistics" in each year