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THE NAVY BEAN INDUSTRY IN NEW SOUTH WALES

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An account of the establishment and growth of the Navy Bean industry in New South Wales will prove of interest and significance to those who give some thought to the prospects of developing to the full the resources of this State.

From a modest beginning in 1942, when 21,014 bushels of navy beans were harvested from 2,792 acres, the project in New South Wales grew, under the stimulation of urgent wartime demands, in two seasons to a large scale industry producing 70,468 bushels from 8,421 acres. The peak production of that season, 1944-1945, has not since been equalled, but navy beans bring in an annual income of about £15,000-£20,000 to the New England district and can, therefore, be regarded as constituting an important industry.

Although the growing of navy beans on a large scale as a commercial undertaking may be said to have begun in 1942, the first year for which reliable statistics are available, experiment and field trials had been conducted for many years prior to this, and it is important to acknowledge the part played by the early experimental work in ensuring a measure of success to the wartime efforts.

There were quite large areas of land planted to navy beans in 1940, under contract to two Sydney firms, and also in 1941, under contract to the Commonwealth Government, but official statistics were not compiled before 1942, so that the figures for acreage and production in these two years are estimates only and must therefore be treated with caution.

Early Experiments.

The Department of Agriculture was taking an active interest in the growing of field beans as long ago as 1918. In that year three bushels of haricot beans (Dwarf Victorian) were procured by the Department and distributed to Experiment Farms at Glen Innes, Grafton and Hawkesbury Agricultural College, so that small experimental plots could be sown. A few farmers in these districts, and on the South Coast, also undertook to sow small plots.

The price then prevailing was £1 per bushel, and yields of between 20 and 25 bushels per acre are known to have been obtained. Harvesting was done by sickle and threshing by flail or pea thresher, when the latter implement was available. Small quantities were shelled by hand.

Due to drought conditions, little success attended the early efforts in 1918 or in the following season. Only at Glen Innes was any crop harvested, and the yield there was no greater than five bushels per acre. The seed obtained from this harvest was distributed in 1920 to a number of localities, including the Murrumbidgee Irrigation Area, Dubbo,

Orange, Kangaroo Valley, Milton, Millthorpe and Oberon. Despite the poor start, the Department considered the prospects were bright for the cultivation of the crop, since large quantities were being imported annually and the wholesale price continued at a comparatively high level. In 1920 imported field beans were priced at 16s. per bushel.

The 1920-21 growing season proved to be more favourable. At Glen Innes a small plot containing about one-third of an acre of black basaltic soil was sown with seed at thirty pounds per acre and super-phosphate at fifty pounds per acre. A crop of 350 pounds of beans, representing a yield of approximately $18 \frac{2}{3}$ bushels per acre, was obtained from this plot.

On the basis of three years' experience with bean crops, it was tentatively concluded that beans would give satisfactory returns in good years, but were not reliable if favourable weather conditions did not persist throughout the season.

Great difficulty was experienced in harvesting operations, and it was soon realised that special machinery would have to be devised. Consideration was also given to the possibility of adopting a method of threshing similar to that used in the production of "Canadian Wonder" beans for seed. This method consisted of pegging two wide strips of hessian to the ground, leaving sufficient space between them for the loaded drays. The crops were then spread out over the hessian and threshed by means of a roller, the dried haulms were turned occasionally with sticks; hayforks were not used as they damaged the hessian. After the haulms had been thrown off the residue was winnowed.

Inquiries as to overseas production of field beans revealed that in the United States of America wheat farmers in some States grew 70 to 80 acres, or even more, of beans instead of allowing the land to lie fallow during summer. The average yield of 800 lbs. of dried beans per acre made it possible for the farmer to gain a gross return of approximately 24 dollars per acre. The cost of production was approximately 6 dollars per acre, so that the farmer was able to net 18 dollars per acre from land that would otherwise lie fallow. Under irrigation the crop yielded 1,200 lbs. to 2,000 lbs. per acre; there was even evidence that yields of up to 3,000 lbs. per acre had been obtained. The three main States then producing beans—Michigan, California and New York—had 784,000 acres under beans in 1909.

It was decided to apply to the United States Department of Agriculture for samples of several varieties of field bean seed and conduct trials at Experiment Farms in the cooler parts of the State, more particularly at Glen Innes. In May, 1921, a small sample of the bean variety, *Phaseolus acutifolius* (S.P.I. 45501) grown at the plant introduction field station at Chico, California, was received and sent to Glen Innes for trial and also to increase the supply of seed. Unfortunately adverse weather during the 1921-1922 season caused all crops to fail.

However, better tidings were in store for the experimenters. In 1922 samples of nine varieties of bean seed were received from the United States in time for planting the 1922-1923 season's crop. The nine seed varieties were: Pink field beans, Lady Washington, Little Navy, Cranberry, Red Mexican, Garbanzo, Red Kidney, White Tepary, and Pinto. The object of these plantings in 1922-1923 was not only to test the

suitability of the new varieties but also to compare them with the haricot bean, the only variety previously grown in this State to any significant extent.

The seed was sown in November and rain fell soon after sowing, with the result that germination was good throughout the plots. With further rain in December and January, the plants made rapid growth and reached maturity without a check.

Difficulties at harvest time again emphasised the need for special harvesting machinery. Without such equipment it seemed unlikely that beans could be grown successfully as a commercial crop.



AN EXCELLENT CROP OF LITTLE NAVY FIELD BEANS.

The seed harvested was plump and attractive. Haricot gave the highest yield as well as the most attractive sample of seed. Pinto, Lady Washington and Little Navy yielded well, but the seed was either mottled or very small. A test of the table qualities of the different varieties revealed a preference by housewives for the white varieties. The Little Navy had the best flavour, while the other beans were fair to good. Garbanzo, a late maturing bean, was very floury and lacked the taste of the other varieties. Experiments were continued in subsequent seasons without great success. Some seed from Glen Innes was sown at the Yanco Experiment Farm where the weather was warmer. Yields during the first year were very light but later showed much improvement.

It did not seem at this stage that the crops could be grown successfully on a commercial basis. However, the Department continued with the experiments in order to determine the most suitable varieties and also to provide seed. In addition, efforts were made to publicise the crop, as it was practically unknown in Australia.

Imports of canning beans remained high and several canning firms declared that they would be interested in buying locally produced beans at approximately the then ruling prices, viz., about 3d. per pound wholesale. Insistence upon white varieties for canning ruled out Pinto, one

of the heaviest yielders. Later White Tepary, another high yielding variety, was tested by a canning firm and considered to be of inferior quality.

Late in the 1920's the trials carried out at Experiment Farms were confined to Haricot, Lady Washington, Improved Robust, Navy and Little Navy. Cannerys were becoming increasingly anxious to see a local industry develop. Although the price being paid in 1928 was about 20s. per bushel, and over 25s. per bushel in 1929, attempts to sponsor large scale commercial production failed. Although the Little Navy had by 1930 achieved some degree of preference, particularly with canning firms, this preference was by no means universal. Some experts argued, for instance, that Improved Robust was more resistant to disease and superior in flavour.

During the first twelve years of field bean trials considerable local experience was gained in the growing of a new crop but, due to the vagaries of the seasons, the two major objectives of selecting the best variety and the best locality had not been achieved with any marked success.

Experiments were again carried out in 1931-1932 at Yanco and Glen Innes under unfavourable weather conditions. At Yanco forty-two varieties of field and Lima beans were tried on a small scale. Extensive roguing for disease was necessary, mainly at the cotyledon stage. As a result of poor germination and roguing, many varieties were eliminated. The following were shown to be the most promising: American Wonder (G 493), Burbank (G 1439), Klein Weisse (G 4-14), Little Navy (G 5-44), Meyer (G 1438), Schofield's Pea Bean (G 601), White Wonder (G 509), York Red Kidney (G 1528), and Pick-Me-Up, easily the heaviest yielding and hardest variety, which was used as a standard.

It was realised that plant breeding tests were a determining factor, but not the final decisive factor, in selecting the most suitable seed varieties for commercial production. This choice rested ultimately upon processing tests and what was considered acceptable to the housewife. Moreover, it was felt that the field bean project had reached the stage where field work, rather than plant breeding work, was demanded. Hence, in ensuing seasons field trials predominated.

The Pre-War Period.

From 1932 to 1939 field trials were held in various parts of the State, mainly with the Little Navy Bean. A favourable season was experienced in 1934-1935 and good harvests, the equivalent of up to 50 bushels per acre of good clean seed, were reported from Orange, Lavington, Griffith, Tamworth and Colo Vale. The prospects of establishing bean growing as a business undertaking were bright.

The prospects were even brighter two years later, when yields equal to about 35 bushels per acre were obtained from much larger plantings on several private farms in the New England district. The 1936-1937 season amply demonstrated the potentialities of canning beans as a commercial crop and justified the conviction, long held by the Department, that this crop offered the opportunity of establishing a new industry in New South Wales.

TABLE A.

Imports of Beans into Australia, 1937-1940.*

Country of Origin.	1937-38.		1938-39.		1939-40.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Centals.	£'s.	Centals.	£'s.	Centals.	£'s.
United Kingdom	230	112	292	662	99	312
Canada	12	46	2,303	1,348	10,168	7,619
Burma	5,329	1,645	11,479	2,762	13,346	6,003
New Zealand	978	2,722	976	1,892	897	1,711
Pacific Island	502	1,947	240	795	855	2,953
Norfolk Islands						
Other British Countries... ..	474	175	791	302	1,030	973
Chile	2,637	1,575	1,547	805	220	171
Hungary	702	536	155	129	218	267
Japan	17,295	11,146	8,196	5,043	10,138	10,431
Madagascar	8,814	4,543	10,353	8,311	722	744
U.S.A.	1,323	1,306	5,899	6,004	9,798	12,828
Other Foreign Countries... ..	1,297	998	1,147	1,062	1,007	768
Total	39,593	26,751	43,378	29,115	48,498	44,780

Note.—The principal varieties of these beans were : Catenashi and Ohtenashi from Japan and Burma, Navy from Canada, Rea from U.S.A., Rice from Chile. They were all similar, being small navy types of the haricot bean family.

Importing States, 1937-1939.

State.	1937-38.		1938-39.	
	Quantity Centals.	Value £'s.	Quantity Centals.	Value £'s.
N.S.W.	17,891	12,586	14,850	10,911
Victoria	14,318	9,668	20,269	12,570
Queensland	4,632	2,786	4,655	3,214
South Australia	789	444	1,449	903
Western Australia	1,896	1,157	2,059	1,277
Tasmania	54	99	92	237
Northern Territory	13	11	4	3
Total	39,593	26,751	43,378	29,115

* Early records did not distinguish the various types of beans ; these statistics refer to beans of all types, including those for canning purposes.

Hence, after a long series of experiments and trials, often discouraging in the extreme, the decade of the "thirties" closed with the stage set for the establishment of a new industry. Much work remained, and still remains, to be done. A good source of supply of disease-free seed, the selection of growing areas which satisfy the exacting climatic requirements of the crop and improved harvesting methods are problems which still leave much scope for experimental work. However, by 1939 most of the pioneering work had been completed. All that was required was the impetus to launch the project as a business undertaking. That impetus came with the outbreak of war when Australia faced the possibility of being cut off from overseas supplies and increased home production became a pressing necessity.

Wartime Production.

Australia's pre-war consumption of beans averaged about 40,000 centals annually, of which New South Wales took about 15,000 centals. These supplies were all imported.

Prior to the Sino-Japanese war beans of the haricot type were imported from Japan for approximately 2½d. per pound, thereafter canners became increasingly dependent on the United States, particularly California, whence canning beans were obtained at about 3¾d. per pound landed in Sydney.

With the outbreak of hostilities in 1939 it became evident that Australia could no longer depend on overseas sources of supply, hence the promotion of home production became necessary in the interests of the nation's war effort.

Though experiments were continued to determine the best varieties to sow and trials continued to locate suitable growing districts, the first large scale plantings of beans were of the Little Navy variety in the New England region, centred around Glen Innes. These small white varieties of beans were also preferred in the cool, humid coastal regions of California. In addition, the Michelite variety, developed by the Michigan State Agricultural College was by 1940 attracting considerable attention chiefly because of its resistance to disease.

Canners in New South Wales estimated their requirements for 1940 at approximately 500 tons. It was further estimated that about 1,800 tons would be required for the whole of Australia. At a price of £30 per ton a bean-growing industry would be worth £54,000 per annum, and it would require over 4,000 acres to grow sufficient quantities of beans to satisfy this local demand.

At its meeting in 1940 the Australian Agricultural Council received the following report from the Standing Committee on Agriculture:—

"It is desirable to take steps to ensure a local production of about 2,000 tons of field beans for canning as rapidly as possible."

When this proposal for large-scale production of field beans became incorporated into the nation's overall plan for increased agricultural production, New South Wales committed herself to an all-out effort to bring large areas of land into bean production. With the knowledge and experience gained during the inter-war years the task could be faced with some confidence. It remained, however, to convince farmers that this confidence was justified.

The first attempts to persuade farmers to grow beans were handicapped by two major deterrents, high freight rates and the lack of suitable and effective harvesting and threshing equipment.

In illustration of these twin handicaps the following example can be quoted. A good crop of beans was harvested in the Glen Innes district in 1940 and threshed with an oat thresher. Despite all the care taken the beans were badly cracked. As the price then offering was up to 4d. per pound, graded and delivered to Sydney, these beans were consigned to the city, freight being charged at 1d. per pound. However, the canneries would not accept the beans because of the cracked skins.

This early disappointment emphasised the need for better harvesting machinery and a more reasonable freight charge. All the machinery hitherto used, including headers, had cracked the beans, only the chaff-cutter threshed without a high rate of cracking, and this machine could handle but limited quantities of seed and could not be used for screening and grading.

Representations by interested organisations were later successful in having the freight rate reduced from £9 per ton (flat rate) to approximately 37s. per ton for truck loads of eight tons, and 65s. per ton for small lots. There still remained a considerable discrepancy between these reduced rates and the rate at which agricultural produce was carried.*

The absence of machinery, either specially designed to harvest beans, or adapted for this purpose, was also a major handicap, a handicap which was exaggerated by lack of field experience in bean growing. Not knowing the stage at which the beans should be harvested, growers were apt to either allow the crops to remain in the field beyond the appropriate time, with the result that the over-ripe crops yielded an excessive number of cracked and damaged grain, or they picked the beans too green, resulting in sweating and hence considerable discolouration of the seed. The curing of grain in windrows became the accepted practice some time later when experience clearly showed the need for it.

A few growers were experimenting in mechanical harvesting of bean crops, and although success did not always attend their efforts, some of their ideas were incorporated in the harvesting equipment which was finally developed.

In the 1940-1941 season commercial production of field beans was undertaken on an extensive scale in the New England district. Over forty farmers, under contract to two prominent Sydney canning firms, planted more than 300 acres of beans. There were also a number of experimental areas sown on the Central Tablelands, mainly in the Tarana, Bathurst, Blayney and Milthorpe districts. These latter trials, despite the unfavourable weather, gave promising results.

Three varieties were sown, the Little Navy, Californian Navy (specially imported from America) and Canadian Pearl (specially imported from Canada). The two latter varieties were heavy yielders but, unfortunately, matured late in the season.

* Subsequently the Railway Commissioner agreed to carry the beans at agricultural produce rates.

The severe drought of 1940 broke towards the end of the year and rain fell frequently in December and January. Thus, the weather was by no means ideal for the first large scale effort.

The adverse weather conditions were not conducive to good crops. Despite these setbacks the yield for the New England district averaged about twelve bushels to the acre, and most of the beans which were harvested before the heavy rains in March, were of good quality. Many crops harvested later were severely damaged and a few samples were rejected by the canning firms as unsuitable for processing.

For the most part the vines were pulled by hand, a slow and costly method, as little more than half an acre per man could be pulled in a day. Other means, such as scything by hand or attaching knife blades to single scufflers, were no more satisfactory. Wet weather during harvesting added to the difficulties. However, in one respect the wet weather was an advantage, for it made the beans soggy so that little damage through cracking occurred, even though steel barred machines were used. Threshing was done by pea-threshers or stationary headers.

The two Sydney canning firms mentioned above had supplied the seed free and had contracted to pay 3¼d. per pound for graded, hand-picked beans f.o.r. Glen Innes and Guyra. A small quantity of beans not grown under contract was sold at 16s. 3d. per bushel for seed.

The 1940-1941 season proved that field beans could be grown on a commercial scale, and it convinced farmers in the New England area that with good farming methods and improved harvesting equipment the crop was worth while, although their general opinion seemed to be that the graded beans were worth 20s. per bushel.

For the 1941-1942 season the Commonwealth Government, through the Department of Supply and Development, contracted with growers to buy canning beans clean and undamaged, at £1 per bushel. The growers undertook to grow beans only from the seed supplied by the Department, the cost of which was to be deducted from the crop returns. In the three succeeding seasons all contracts were in the name of the Commonwealth Government.

The price for A1 grade beans in 1942-1943 was 25s. per bushel and 28s. per bushel in the following two seasons of 1943-1944 and 1944-1945.

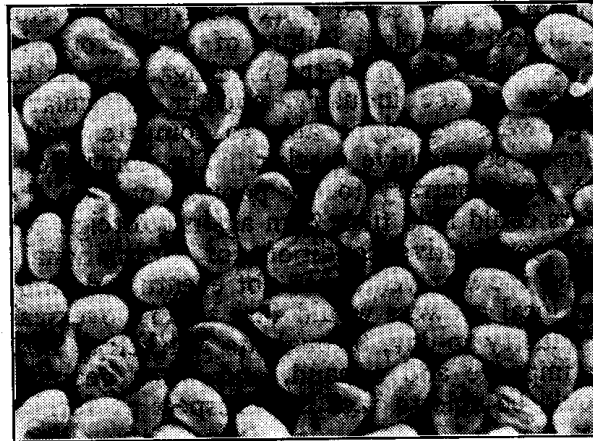
The seasons to 1944-1945 witnessed substantial increases in acreage as the following table shows.

TABLE B.
Production of Navy Beans in New South Wales, 1942-1948.

Year.	Area (Acres).		Production (Bushels).
	Sown.	Harvested.	
1942-43	*	2,792	21,014
1943-44	6,828	5,669	55,558
1944-45	8,869	8,421	70,468
1945-46	8,550	7,106	55,214
1946-47	4,136	3,111	24,487
1947-48	2,441	*	10,973

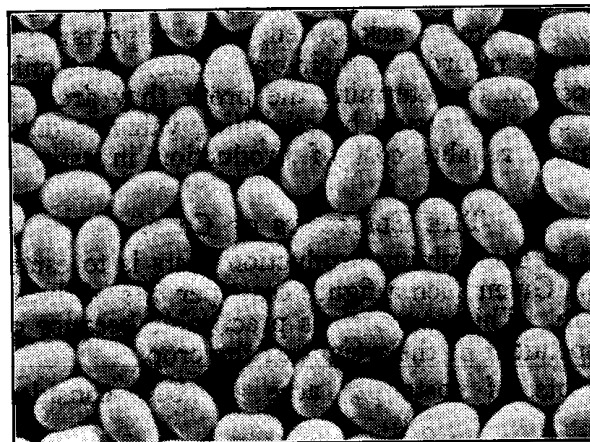
* Not available.

However, the weather during some of these seasons was adverse and considerable losses were incurred which imperilled the popularity of the crop among farmers in the New England district. These discouragements culminated in the season of 1944-1945 when, although the area harvested was about 60 per cent. above the previous year, total production increased by only 27 per cent. Moreover, the weather had affected



INFERIOR SAMPLE

Totally unsuitable for canning or seed purposes.



A GOOD SAMPLE OF LITTLE NAVY FIELD BEANS.

Note uniformity of colour and shape. (About natural size).

the quality of the beans and only a very small proportion of the total quantity graded was considered AI. In view of the risks associated with the crop growers would naturally look for compensation in attractive profit margins or turn their attention to more payable crops like maize, peas and other vegetables.

An Economic Survey of the Industry.

In 1944, following upon a recommendation of the New South Wales Vegetable Production and Marketing Advisory Committee, the Division of Marketing and Agricultural Economics undertook an economic investigation into the production of canning beans. The investigation aimed first at assessing costs of production to determine whether, having regard to the then ruling prices for beans, the crop represented a payable business. Growers had been dissatisfied with the prices paid for some time and the increased price allowed to Victorian growers, because of the almost complete failure of their crops, increased their dissatisfaction. A second aim of the investigation was to estimate the post-war prospects of the industry, and in particular to determine whether local growers would be able to compete with the imported article on the open competitive market. The conclusion advanced on this latter score was, contrary to the popular opinion then prevailing, that local growers could hold their own against foreign producers. The return to highly competitive conditions of international trade, freely anticipated during the war years, has not eventuated, and it is not possible to say how local growers would fare against overseas competition. However, the industry to-day, through its Marketing Board, has every opportunity to improve and expand, and when geared to maximum efficiency it should be able to face the prospect of foreign competition with equanimity.

A cost of production survey is difficult and unsatisfactory at any time, as conditions of production and items of cost vary so widely from place to place. However, realising the imperfections necessarily associated with any such survey it remains worth while to consider the elements of cost which were taken into account and the conclusions which resulted from the 1944 field investigations. It would be an encouraging sign, indeed, if growers were to acknowledge the importance of this work by keeping accurate records of their own costs. Not only would they be then in a position to determine the profit they are making from a particular crop, but they would be compiling valuable data upon which a future and more reliable cost of production investigation could be based.

THE ELEMENTS OF COST.

The first step in determining production costs is to establish costs on a per *acre* basis. Given such a figure costs per *bushel* then depend upon the yield per acre. This approach is practicable because costs per acre are largely independent of the weight of the crop.

The components of costs per acre are best considered in three groups.

Pre-harvesting costs.—These cover the rental value of the land and all costs of preparing the soil, sowing—including the cost of seed and fertiliser used—and subsequent cultural operations. For given technical methods this group of costs is quite independent of yield. They are incurred and have to be borne by the number of bushels obtained from each acre. To the extent, however, that better methods of preparation involve higher costs, yield is not independent of pre-harvesting costs.

Harvesting Costs.—These are more closely related to the area covered than the yield per acre. They are not always independent of yield, but no simple rule covers the effect of an increase in yield on costs per acre.

It appears likely, however, that a very light crop would lead to higher acre costs, owing to the difficulty of handling with up-to-date machinery. Very heavy crops also may mean higher costs per acre.

Marketing Costs.—Costs for bags, cartage and grading when assessed on an acreage basis rise with yield, leaving costs per bushel constant.

The fact that production costs per acre remain fairly constant while cost per bushel naturally varies inversely with the yield demonstrate the importance of efficient farming methods. Certainly, some of these improved methods might involve some additions to production costs but, in general, improvements in farming methods will enable the grower not only to increase his yield per acre, and hence total returns on his crop, but also to widen the margin between costs and returns on each bushel. Moreover, efficient growers will be harvesting a better quality bean, the very small proportion of beans which at present make the top grade are an indication of how much the grower stands to benefit by improved farming methods.

TABLE C.
Navy Bean Board's Intake of Beans, 1947.
Quantity of Beans According to Grade.

Grade.*	% Good Seed.*	Quantity (bushels).	Grade.*	% Good Seed.*	Quantity (bushels).
1 ...	98%	601.04	4 ...	88%	4,442.10
2 ...	95%	3,114.30	5 ...	85%	5,863.23
3 ...	91%	6,285.40			

Note.—There were in addition 953 bushels kept for seed purposes and also 70.10 bushels of Great Northern.

* The grade of a quantity of beans is determined by the percentage of good clean seed in sample test.

The analysis based on the production costs actually incurred by growers who co-operated in the investigation revealed that costs amounted to between £6 and £7 per acre. Production costs per bushel varied, of course, with yield, but assuming an average yield of eight bushels per acre the cost per bushel would be between 15s. and 17s. 6d. With the price at 28s. per bushel f.o.r., this allowed a reasonable margin of profit.

Since 1944-1945 prices have risen and in 1947-1948 were 34s. per bushel for A1 grade and 31s. per bushel for standard grade. Though costs of production have also risen it is evident that bean-growing represents an attractive proposition to an efficient farmer.

The Problem of Machinery, 1940-1946.

Difficulties in regard to machinery, particularly for harvesting, had dogged the bean-growing project since its inception in spite of the ingenuity which had been displayed by a number of growers in adapting other farm implements to the purpose. In the Oberon district, for example, an old potato digger had been converted for cutting pea-vines and then tried on harvesting beans, and in Queensland a peanut cultivator with the cutting blades adjusted had proved fairly satisfactory.

Without adequate and suitable machinery the plans formulated by both Commonwealth and State Governments in 1940 for vastly increased acreages were not capable of attainment. It was hoped in 1942, for instance, that about 3,000 acres would be given over to the cultivation of beans in the then forthcoming season, so that a solution to the vexed problem of machinery could not be long delayed.

An officer of the Commonwealth Department of Supply and Development visited the United States in 1942 on behalf of the Commonwealth Government, and after a thorough investigation of the bean-growing industry returned to Australia with much valuable information and a number of machines for distribution throughout the Commonwealth. The machines imported for the bean industry in New England were a number of horse-drawn two-row bean cutters, pea-bean stationary threshers, four-row bean planters and an all-crop harvester with pick-up attachment; of these implements only the cutters found their way into general use, and these were subsequently manufactured by Australian implement firms.



BEAN CURING IN COCKS.

The beans are cut and formed into windrows, then cured in heaps and later threshed.

The All-Crop harvester, although extensively used in America, did not prove satisfactory under the conditions which prevailed in the New England district. Threshing the crop was eventually done by a well-known Australian header (specially adapted after considerable experimental work) with a "pick-up" front to lift the vines from the windrow and with a rubber-covered bar and concave threshing drum to overcome the ever present problem of cracking the grain. In addition to these machines for use in the field the Commonwealth also imported a Clipper-D grading machine as well as picking and polishing equipment.

As part of the war-time plans to stimulate production of essential foodstuffs the Commonwealth Government set up a number of Machinery Pools throughout this State. Pools were established at

Guyra, Leeton, Cowra and Batlow, as these towns commended themselves as machinery headquarters for four major areas engaged in large scale food production of a type which would benefit immensely from a high degree of mechanisation. Much of the equipment used by the Pools was obtained from America under the Lend-Lease Agreement.

In the New England where the main concern was for the production of navy beans, the Commonwealth had originally set up a control committee with representatives from the main producing centres of Glen Innes, Guyra and Armidale.

These representatives had been appointed by the appropriate District War Agricultural Committees, drawn from the then existing branches of the Bean Growers' Association. This control committee was the first organisation to be established in the form of a machinery pool, and it administered the hiring of the lend-lease equipment. The official title of the committee was originally the "New England Navy Bean Special Purposes Committee," but this title was subsequently changed to "New England Lease Lend Agricultural Machinery Pool Control Committee."

With the establishment in 1943 of Machinery Pools at Guyra and elsewhere, the Commonwealth handed over to the State Government the responsibility of organising them on a uniform and efficient basis, and also of arranging for their administration which was channelled through the executive of the District War Agricultural Committee organisation. The original Control or Special Purposes Committee at Guyra was then replaced by a committee appointed by the State Minister for Agriculture and became known as the Machinery Pool Committee. The members of this Committee consisted of the three growers' representatives of the former Control Committee and two Government officials, one of whom became chairman.

It was the duty of this Machinery Pool Committee to formulate the general policy for the proper working of the Pool, to acquire the requisite machinery and fix hire charges. Within a short period quite a number of machines had been obtained and the erection of stores and implement sheds was put in hand. A resident manager was appointed with the necessary clerical staff to handle the administration and supervise the working of the machinery.

The machinery Pool at Guyra having been established mainly to handle one special crop, i.e., navy beans, carried nearly £30,000 worth of machinery, most of which was suitable only for handling beans. The comparative lack of multi-purpose equipment and the need to concentrate on the bean industry limited the Pool's ability to cater for other industries such as potatoes and oats. This limitation deprived the Pool of a most lucrative source of revenue.

It was estimated that of the Pool's total plant, 75 per cent. was required by the navy bean industry, and furthermore that 50 per cent. or more of the Pool's wages bill, transport costs, fuel and machinery repairs were incurred during the three months period of the navy bean harvest.

The following list of machinery used solely in the production of navy beans gives some idea of the size of the undertaking:—

TABLE D.

No.	Machine.	Cost.		
		£	s.	d.
14	Headers	3,419	10	0
40	Harvey Bean Cutters	1,260	0	0
12	Robey Bean Cutters	606	0	0
10	International Cutters	350	0	0
10	4-row Bean Planter	460	0	0
10	4-row Cultivators	1,296	0	0
18	Tractors 60 per cent. of the time	11,400	0	0

Bean crops were scattered over a fairly wide area. Growers in districts as far apart as Tenterfield and Woolbrook relied upon the Machinery Pool to handle their crops. Indeed, without the Pool the wartime levels of acreage and production could never have been achieved.

Experience during 1943 and 1944 showed that the locating of all the machinery in one central depot at Guyra seriously handicapped the Pool's efforts to cover an exceedingly wide area of production. There was an obvious need for some degree of decentralisation and for the 1944-45 season depots were established at Armidale and Glen Innes with an operator-organiser at each depot to service the machinery and make general arrangements for harvesting. Harvesting in the Guya area was still controlled from the main Pool depot.

This system of local depots resulted in more efficient operation of plant and speedier response to the demands of growers for harvesting plant. All the difficulties attending harvesting were not, of course, overcome. Many growers required harvesters at the same time, but as there were insufficient machines, or tractors, to fulfil the demand, it was decided for the 1945-46 harvest, that headers and tractors would be allocated to zones of approximately 500 acres each. Meetings of growers were held in each zone and the general harvesting plan was outlined, then a representative was appointed to organise the use of the plant within the zone.

The acreage to be harvested in 1945-46 was currently expected to be in the vicinity of 10,000 and the Pool was called upon to provide machinery for 304 growers, with areas averaging 27 acres, with some plots up to 250 acres over a tract of country stretching from Deepwater to Woolbrook.

The 1945-46 season proved difficult and adverse for all concerned, the weather was unfavourable and the troubles arising out of the attempt to cover many scattered fields with a limited amount of equipment were numerous indeed. It says much for the Pool's efficiency and the growers' co-operation that despite these adversities the production of beans reached the level which it did.

When the war ended in 1945 the urgency associated with war-time food production diminished and the Commonwealth Government decided to end the scheme of Machinery Pools. The date for the winding-up was set down at 31st May, 1946, in order that all harvesting operations

for the 1945-46 navy bean season could be completed smoothly. Speculation was immediately aroused as to the disposition of the machinery in the pool and also as to the future prospects of the industry itself in the post-war years. Governments recognised the need to effect the transition from Government-operated pooling to private pooling or contracting as smoothly as possible and everything was done to achieve this objective.

In addition to the Commonwealth Machinery Pool there were in the New England region a number of co-operative machinery pools which had participated to some extent in the bean-growing industry. These co-operative pools, and the Northern N.S.W. Farmers' Union, the principal producer-organisation in the New England, were anxious to acquire the plant from the Commonwealth Pool in order to ensure that sufficient machinery would be available for harvesting future bean crops. The bulk of the plant was finally acquired by the Northern Farmers' Union and distributed among the co-operative pools. The Northern Farmers' Union also arranged with the Commonwealth Government to reserve from sale the machinery shed, warehouse, and seed-cleaning plant at the Guyra depot, so that it could be acquired by a marketing board if producers decided to set up such an organisation.

Establishment of the Navy Bean Marketing Board.

In the best of the wartime seasons (1944) the value of the Navy Bean Industry amounted to about £100,000 in the New England district, and had therefore attained the status of a major industry. Both growers and Government were anxious for these reasons to see the industry permanently established. Meetings of bean growers were held at Glen Innes, Armidale and Guyra during 1945 to discuss means of stabilising the industry. The proposal to set up a marketing board under the Marketing of Primary Products Act (1927-40) attracted wide support.

A poll of growers was taken in 1946, which resulted in a majority vote in favour of the constitution of a board. By proclamation dated 26th June, 1946, the Navy Bean Marketing Board for the State of New South Wales was appointed, consisting of five producer representatives, all from the New England district, and two Government nominees. By a later proclamation, all beans produced in the State became vested in the newly-constituted Board.

The first meeting of the Board was held on 31st July, 1946, at Guyra. After a review of the seed supply position, the Board decided to issue a press statement for the benefit of growers, assuring them that sufficient seed was available to plant 10,000 acres of beans, and confidently anticipating that it would be able to pay a price of not less than 28s. per bushel for A1 quality beans in respect of the 1946-47 season. Its first announcement made it clear that any contracts which may have been previously entered into by growers with manufacturers were, by virtue of the establishment of the Board, null and void. The Board at this meeting also discussed the purchase of land, machinery, pool buildings and agricultural equipment at Guyra, then owned by the Commonwealth Government.

With the support of a State Government guarantee, the Board was granted in advance of £41,000 by the Rural Bank of New South Wales. This advance consisted of £1,000 for immediate use to meet administrative expenses and an amount of £20,000 to be made available in the

near future to acquire the land and buildings at Guyra, the bean-cleaning plant that had been purchased in the United States of America, and also approximately 140 tons of seed. Another £20,000 was to be made available at a later date, so that first advances could be made to growers pending the receipt of crop proceeds and the finalising of pool accounts. At the same time the former manager of the Guyra Machinery Pool was appointed Secretary-Manager to the Board, and he took up duties on 30th September, 1946.

The first season of the Board's activities (1946-47) was good, although wet weather caused some damage to the quality of the beans. In all, 25,496 bushels of beans were received from growers, and advances totalling £25,678 were distributed to producers according to the five grades of beans which the Board had specified to be laid down in regulations. The balance of £1,247 was distributed to growers according to relevant lodgment of beans, irrespective of grades. The average return to the 109 growers who delivered beans to the Board was therefore £246.

In its first report to growers the Board showed a total income of £37,046, with £910 worth of stock on hand at the end of the period. This total credit of £37,956 was applied as follows:—

Purchases of seed	£6,106
Cleaning, receiving, despatching beans ..	1,022
Storage and handling	748
Administrative costs	2,115
Reduction of debt and interest	1,040
Distributed to growers by first advance ..	25,678
Balance	1,247
	£37,956

From the above financial statement it will be seen that administrative costs amounted to £2,115 for the period. This sum represents only a fraction above 4 per cent. of the Board's total income, a fact worthy of comment in view of the criticisms which are often levelled against collective marketing boards to the effect that they are costly and inefficient. For this comparatively small levy, growers were freed of the responsibility of individually marketing their product and were assured of receiving uniform and at the same time the best available returns for their produce. In pursuance of its marketing obligations, the Board had called together in conference the representatives of Australian canning firms interested in navy beans, and was thus able to directly negotiate with the whole market. Having fixed a satisfactory price for the various grades of beans, the Board then allocated the available supplies among the canning firms. There is no doubt that these arrangements were satisfactory to both growers and canners in that the Board made it possible for growers to receive, on the whole, better prices than they would have obtained by individual bargaining, and furthermore, the distribution of the available beans among the various competing processing firms was placed on a more equitable and businesslike basis than would otherwise have been the case.

Apart from these considerations, the Board's service to growers manifests itself also in other, more material, ways. For example, the Board possesses over £2,000 worth of cleaning machinery with which

it endeavours to raise the grading of all low-quality beans consigned to it. If, having put a quantity of beans through the Clipper D machine, it is then thought that a better grading could be obtained after further treatment, the beans are put through an Oxford bean polisher, so that everything is done to enhance the value of the grower's consignment. Furthermore, the Board has at present under active consideration a proposal to install drying machinery in order to minimise loss through shrinkage.

Unfortunately, during the second season of the Board's operations (1947-48), a period of very wet weather coincided with the planting of the crop, with consequent depletion of yields and complete loss of many crops. The production for the year was only 11,000 bushels, representing a decline of 50 per cent. below the previous year. However, on the favourable side, the general quality of beans was higher than in the 1946-47 season.

The unsatisfactory nature of these, the first two seasons of the Board's operations, was an unfortunate disappointment for the industry and the Board. As a result, some growers have turned from the production of navy beans to what they consider are more attractive propositions, e.g., wool and maize. Despite these temporary setbacks, however, the Board has cause to be justly proud of its achievement and it deserves the confidence of all growers within its jurisdiction.

TABLE E.

*Imports into Australia of Beans, unprepared, for Year 1946-47 and Three Months ended September, 1947.**

Country of Origin.	1946-47.		July-September, 1947.	
	Quantity	Value	Quantity	Value
	Cental.	£ stg.	Cental.	£ stg.
United Kingdom	11	26	1	11
Aden and Dependencies	136	457	...	...
Australian Terr.—				
Norfolk Is. ... ..	...	3,301	...	...
Canada	120	178	31	167
East Africa (Br.)—				
Kenya ... ..	...	...	2	3
Tanganyika Territory	680	1,484	...	...
Hong Kong	25	73	...	...
New Zealand	337	1,102	...	...
Union of South Africa	27,825	43,078	22,322	44,370
China	43	251	17	117
Egypt	95	379	...	...
United States of America	678	1,188	23	29
IMPORTING STATES.				
New South Wales	10,536	23,933	2,854	5,870
Victoria	17,917	24,467	19,060	36,889
Queensland ... ..	...	...	224	425
South Australia	1,362	2,821	22	47
West Australia	124	243	235	1,455
Tasmania	11	53	1	11

* Import statistics do not distinguish Navy Beans from other types of beans, but these figures do suggest that the pre-war demand for canning beans is being well maintained. Without a doubt Australian canners could absorb much more than local producers can at present supply.

Prospects for the Industry.

A vote of growers will be taken soon to elect members to constitute the Navy Bean Marketing Board during its second term of three years. For this and other reasons the time is opportune to review the prospects of navy bean growing as a permanent industry. The Marketing Board has come through a difficult period with a good measure of success to its credit. It is reasonably safe to conclude that if the Board had not been set up and a nucleus of organisation established in the New England district, the navy bean growing industry would have languished and might even have died out for the want of producer support for what was at the time a rather problematical crop.



STACKING LITTLE NAVY BEANS PRIOR TO THRESHING IN THE GLEN INNES DISTRICT.

There are still problems which confront the Board, even though it has gained a commendable degree of financial security in the short time it has operated. A source of supply of disease-free seed is one such problem, but by encouraging, through personal canvassing and price incentives, the planting of several areas of good bean seed in isolated localities, it may soon be possible to have an assured supply of good seed for planting purposes. In addition, the Board is negotiating for the purchase of a considerable quantity of approved seed from America.

The high percentage of low-grade beans sent in by growers poses two problems for the Board. Although everything is done to enhance the selling value of the beans by putting them through the various processes of the cleaning plant, the Board can do little with the greater part of the low-grade consignments. This problem can only be effectively solved by improved farming methods. The Board has also discussed with cannery representatives the possibility of some revision of the present grading standards which could offset losses that do now occur. Canning tests carried out by the Commonwealth Council for

Scientific and Industrial Research and by the Board itself, have demonstrated that samples of beans with less than 98 per cent. good clean seed, do yield a good product when processed. In flavour they are equal to the first-grade samples and their appearance is not significantly less attractive. If the Board's efforts in these directions are successful, it should be possible for growers' returns to be considerably increased in future seasons.

The paramount problem of the navy bean industry is, however, the comparative lack of interest in bean growing on the part of New England farmers. The Board has repeatedly campaigned for increased acreages, but it is an unfortunate fact that production has declined in recent seasons even though a satisfactory market has been offered.

There appear to be two main reasons why navy bean growing is not more popular. The first is the grower's preference for alternative propositions, e.g., maize and wool growing, and the second, the discouragement many growers have experienced in the last few years. This may be short-sighted policy on the part of farmers. Bean prices have remained consistently good for two or three seasons, and although these prices may have been less attractive than those obtaining for such commodities as maize and wool, these latter prices may fluctuate in future years, whilst bean growing, supported by stabilised marketing arrangements, should in all probability continue to give steady returns.

Equally important as this question of price incentive is the failure, because of unfavourable weather conditions, which has attended the efforts of some farmers. Appreciable losses have been incurred through pests and adverse weather, but these should be reducible by a general improvement in farming methods—early ploughing, thorough preparation of the soil and rabbit control. Thereby it should be possible to increase both average yield and total production.

Harvesting time seems to be most troublesome to farmers, particularly if it coincides with heavy rain. Farmers of the New England district have developed a method of harvesting which is effective whilst favourable weather holds, but to use this method, as many do, irrespective of weather conditions, rain or fine, is to court disaster. Local growers would do well to study alternative methods, and in particular the harvesting procedure developed in Wisconsin (U.S.A.), which offers a means of overcoming wet weather risks. In this American State the beans are cut in the usual way and then placed in small stooks or heaps around a stick and subsequently threshed. Besides turning off the rain, these stooks enable the beans to cure more satisfactorily and give a lower percentage of damaged seed in the course of final cleaning operations.

There is a good and constant local demand for canning beans which is not likely to diminish. It is improbable that overseas competition will present dangers to the developing industry for some time. Growers have, therefore, an opportunity to make attractive returns from a crop which occupies the ground for a few months only and considerably improves its fertility.

The future of Navy Bean growing would appear to rest in the hands of the farmers in the producing districts. There is every need in Australia for a diversification of farming and for the adoption of farming practices which will maintain and build up soil fertility. We hear

much of the possibilities of new industries which would give added security to Australian farming. It is clear, however, that irrespective of what plans are made, every new venture rests in the ultimate upon the enterprise and endeavours of many people, officials and private citizens, and this is so with the Navy Bean industry. Much, also, is heard of the value and possibilities of collective marketing and of the importance of stabilised prices upon the security of growers. Here again, in the Navy Bean industry, is to be seen an example of one such type of collective marketing which enables a developing industry to be fostered in ways which otherwise would be very difficult.

For all these reasons the development of the Navy Bean industry in New South Wales is of particular interest and wide significance.
