

COMMERCIAL LENTIL PRODUCTION IN CANTERBURY

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ABSTRACT

Commercial lentil cropping commenced in 1982 with 115 ha planted, predominantly in autumn.

Planting on free-draining soils coupled with good weed control and a drier than average season contributed to a very high average yield of 2.5 tonnes/hectare. This is more than double the average yield of intensively cropped lentils in USA and Canada.

Climate, topography, crop management, processing, marketing, and the extension requirements of this new-to-New Zealand crop are discussed.

Additional Keywords: small red, yellow cultivars

INTRODUCTION

Lentils are the world's fifth most important grain legume. Two million tonnes are produced annually from 1.2 million ha. World trade in lentils is comparatively small, with USA being the major exporter.

Most lentils are spring-sown either in semi-arid situations at higher latitudes or in high altitude regions around the Mediterranean. They are rarely irrigated. Yields are commonly 400-500 kg/ha except under mechanisation in the USA, Canada, and USSR, where yields average 1-1.2 t/ha. The highest reported yields, of about 1.7 t/ha, are from France.

Lentil research in New Zealand began in 1972. Earlier commercial attempts at production were not successful. Given the crop's wide dryland distribution at diverse latitudes, it was postulated that lentils could be successfully grown in New Zealand with appropriate agronomic treatment.

DEVELOPMENT

A decade of research on lentil cultivar selection and agronomy was described previously (Butler and Jermyn, 1981; Jermyn *et al.*, 1981)

Modest success with small block trials on farms in 1980/81 and an undertaking from Dalgety (NZ) Ltd to carry out processing and marketing evaluation of the product, led to that company's appointment as interim licensee for the cultivar named Titore. This cultivar has small (33 g/1000 seeds) red cotyledoned seeds. From a nucleus crop in 1981/82, sufficient seed was obtained to plant up to 120 ha. Encouraged by market acceptance and a favourable product price, Dalgety offered grower contracts in autumn 1982.

Local farmer interest was high at a field day held at Methven in May 1982. Agronomic requirements and contract details were explained and subsequently 20 farmers agreed to grow between 3 and 10 ha each. All but one planted in autumn. In addition, six farmers contracted to grow small areas of yellow lentils (cultivar of unknown origin, probably Palouse weighing 57 g/1000 seeds) for another merchant. Recommendations for crop management were identical with those for Titore except for an increase in seeding rate to 80-90 kg/ha.

CROP ENVIRONMENT

The crops were situated on the Canterbury plains on mainly yellow grey earth and recent alluvial soils with considerable areas of moderately fertile well-drained loams or silt loams over gravel rising westwards from 10 to 300 a.s.l.

Daylength varies from 9 hrs in June to almost 16 in December. Mean monthly minimum/maximum screen air temperatures range from about 0/10 degrees C in June/July up to 9/23 degrees C in January. The average rainfall for the May 1 to January 31 period is 567 mm, spread quite evenly at about 60 mm per month. In 1982/83, the total rainfall for the period was only 476 mm and temperatures were near normal.

CROPPING PRACTICE

In accord with recommendations, crops were sown in May and June into cultivated seedbeds at 70-80 kg/ha. Few growers used the recommended pre-emergence herbicide cyanazine (Butler and Jermyn, 1981)

There were only three crop failures resulting from incorrect use of trifluralin in mid-winter, insufficient vegetation control prior to direct drilling followed by CDA application of double the recommended rate of metribuzin and from severe wind erosion shortly after crop emergence.

Most crops were inspected in mid-September and those growers with significant weed populations were advised to spray with 0.175 kg/ha a.i. metribuzin. Some crop discoloration and 'burning' were evident a few days after application and two crops were damaged by overlapping and heavier-than-recommended application rates. Volunteer cereal contamination in some crops was successfully controlled with wick-boom application of glyphosate and couch, (*Agropyron repens*) was effectively suppressed in one crop with fluzafop-butyl at 0.5 kg/h a.i.

PESTS AND DISEASES

Birds caused damage to seedlings in some areas by removing the stems just below ground level. However, new shoots developed from one or both of the axillary nodes below the stem truncation. In one field, large irregular patches of plants showing reduced vigour, chlorosis and

death by mid-September were due to attack by grass grub, (*Costelytra zealandica* White). This was considered unusual because the insect rarely feeds on legumes and the timing indicated that the grubs were in their second year which only happens in extremely dry conditions. (J.A. Wightman, pers. comm.). Thus there may be some risk to lentils if planted after grass grub infested pasture.

Slight to moderate populations of pea aphid (*Acyrtosiphon pisum*) built up in some crops in November and December and were successfully controlled with a single aphicide application.

CROP DEVELOPMENT

Plant growth was slow during the winter months so that by mid-September crop height was approximately 10cm and ground cover was estimated at 40-50%. Growth was rapid in October and in most crops canopy closure was complete towards the middle of November. Flowering commenced at around the beginning of December and early signs of senescence appeared in late December.

Three crops planted early in May were direct combine harvested at 14% moisture on 9th January, and harvesting was completed in early February.

Because of the flat terrain and generally level seedbed preparation, direct heading was fast and effective, and harvest losses were no greater than usually seen in other crops (less than 5%).

Yields ranged from 0.65 to 3.75 t/ha and averaged 2.7 t/ha over the 17 Titore crops harvested. Six yielded over 3 t/ha and three yielded less than 2 t/ha.

The recorded yields are exceptionally high compared with other lentil production areas. While it is accepted that microsperma types (mostly red) tend to outyield macrosperma types (mostly yellow), the long crop duration (240 days) allowing for prolonged light interception and hence high dry matter accumulation and very effective weed control were major factors leading to the high yields.

The six yellow lentil crops yielded from 0.8 to 2.6 t/ha and averaged 1.85. Weed control was not as satisfactory in these crops, and previous trial data (Jermyn *et al.*, 1981) had indicated that the cultivar yielded less than Titore.

PROCESSING

After dressing to remove trash, pods, and broken seeds, the lentils were passed through a conventional pea splitter which was adjusted for lentils until the return of acceptable quality split lentils reached approximately 65% of input weight.

MARKET PROSPECTS

The domestic market for lentils (all types) has averaged around 120 t/yr according to import statistics. Recent medical evidence and publicity relating to the benefits of increased fibre in the human diet have led to increased interest in all the pulses. It is believed that this interest will be sustained and that the consumption of pulses will increase.

Prospects for exports to Australia, South East Asia and the Middle East are good but price will depend on supplies from major exporters, including Turkey (reds) and USA and Canada (yellows). As with other New Zealand export arable crop commodities like peas, clover seed and barley, world price will fluctuate with supplies. Given the relatively high yields of lentils in New Zealand, prospects for a profitable export crop and very high.

EXTENSION AND PROMOTION

With a new crop like lentils, it was considered necessary to produce a 'management package' for growers and to explain to interested parties at the outset what risk situations there were so that unsuitable soil types and climatic conditions could be avoided. Crop Research Division of DSIR published an Agricultural Bulletin entitled 'Guidelines for growing lentils' and copies were distributed at the inaugural field day. Subsequently, DSIR staff and company representatives co-operated in giving management advice to growers.

Following a company-sponsored one-day bus tour of new arable crop developments in December 1982, lentils received broad coverage in local and national agricultural media. The harvest featured in television news nationwide on January 22 and it was a salutary lesson in the power of that medium that a very informative piece of reporting conveyed, in 90 seconds, as much as a 15 minute talk or a half page newspaper article.

During the cropping season, a 16 mm film of 12 minutes duration was made by the DSIR Audio-visual Unit film crew for extension purposes.

Local sales of the split lentils have been satisfactory but a drop in the world price late in 1982 meant that the New Zealand product was overpriced and could not compete on export markets.

For the 1983 crop, of approximately 300 ha, Dalgety (NZ) Ltd have contracted with growers in a participating scheme designed to meet the local demand as well as to offer a small tonnage on the international market.

No yellow lentils have been contracted for 1983 because of the current easing of the world market price but trial and farmer yields with this type suggests that areas will be contracted in future years.

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