Table 91: Effect of Irrigation on Growth and Yield of Broad Beans at Symmons Plains, 2003-04

Treatment	Final density (plant/m²)	Height (cm)	Pods/m²	Seeds/pod	100 seed weight	Yield (t/ha)
unirrigated	16.0	82.3	171.6	1.98	124.2	2.77
irrigated	13.9	91.7	206.2	2.22	146.3	4.45
LSD	**ns**	**8.4**	**30.9**	**ns**	**2.4**	**0.89**

Marrowfat peas: Irrigated plots continued to flower until mid January – nearly 3 weeks longer than unirrigated plots. The variety Midichi is listed as resistant to powdery mildew but the disease appeared in mid-late January and before spraying, had some impact on plant growth particularly in the irrigated plots.

Although not statistically significant, irrigation appeared to increase plant survival. This is perhaps not surprising given the very dry spring and summer that also adversely affected grain yield of unirrigated plots .

Table 92: Effect of Irrigation on Growth and Yield of Marrowfat Peas at Symmons Plains, 2003-04

Treatment	Final density (plants/m²)	100 seed weight	Yield (t/ha)
unirrigated	54.4	34.0	0.90
irrigated	58.3	36.1	3.65
lsd	ns (P=0.08)	0.5	0.42

Hand harvested samples are currently being processed. 100 seed weight was significantly higher for the irrigated treatment. As all plots were taken through to dry grain maturity there was a significant amount of bleaching but visually there was no difference between treatments. Commercially the amount of bleaching would be dependent on the time of windrowing.

Conclusions:

- Irrigation resulted in a 60% and 400% increase in grain yield for broad beans and marrowfat peas respectively.
- Irrigation resulted in a 17% and 3% increase in seed size in broad beans and marrowfat peas respectively. This is critical in producing for markets requiring large seed size.
- It is likely that the dry finish to the season (decile 1) enhanced the positive effects of irrigation particularly for the marrowfat peas and other spring sown crops.
- In addition to the capacity to irrigate and a cool seasonal finish, Tasmania has other advantages in marrowfat pea production that can be capitalised upon ie
  - excellent adaptation of overseas spring germplasm
  - freedom from pea weevil.

11.2 THE BENEFIT OF RAISED BEDS FOR ALBUS LUPIN PRODUCTION – SYMMONS PLAINS

Location: Symmons Plains

Researchers: Geoff Dean (SFS Ltd)
Peter Johnson (TIAR)

Acknowledgements:
GRDC, Simon Munford, Andrew Legro,

Growing Season rainfall (April-Nov): 489 mm

Aim:
To compare the performance of crops on raised beds versus strategic field drainage.

Background:
Raised beds have provided an environment largely free of waterlogging for crops that are sensitive to excess water. The down-side has been more rapid drying of the soil profile in late spring and early summer during grain fill. Another approach is to use strategically placed drains at regular intervals to allow good crop growth (little waterlogging) without the same loss of water from the soil profile at the end of the season.

Methodology:
Two parallel drains 50m apart were formed using a grader. Raised beds were run across this ground perpendicular to the main drains. Three sections (each 27m wide) were left unbedded. As this unbedded area received the same degree of soil preparation as the beds, any additional benefit of raised beds over surveyed drains at regular intervals can be measured.

Albus lupins (lupini beans for human consumption) were sown in 2003-04. The trial area was sown with poppies in 2001-02 and wheat in 2002-03.

Treatments: Three replicates
- Raised beds 1.8m wide
- Large graded drains at 50m interval

Sowing Date: 12 May 2003
Sowing rate: 350 kg/ha
Harvest Date: 13 February 2004
Fertiliser: 250kg/ha 4:14:7:9 + Mo,B
Weed Control:
PSPE - Stomp 2.5//ha, Gesatop 2.2//ha
In crop – Brodal 150ml, Select 400ml

Results and Discussion:

The season at Symmons Plains will be remembered for a particularly wet winter (decile 7) and a very dry finish (decile 1).

The high rainfall during winter (132mm in June) and early spring caused extensive waterlogging damage to the unbedded plots. Although there were some areas where plants did not survive, there was no significant difference in final plant numbers between bedded and unbedded plots.

Grain yield per m² of sown area on the raised beds was over twice that of unbedded ground. However the final yield needs to account for the furrow area between beds. As shown in Table 93, grain yields on a per hectare basis were still significantly different with the raised beds yielding 60% higher than the unbedded area. The yield increase was largely due to more pods and seeds per pod. Samples will be further processed to determine seed weight and percentage of seed greater than the industry standards of 13mm and 15mm.

Table 93: Effect of Raised Beds on Growth and Yield of Albus Lupins (Lupini Beans) at Symmons Plains

Treatment	Final density (plants/m²)	Height (cm)	Pods/m²	Seeds/pod	Yield (t/ha)
Unbedded	21.7	65.5	152	3.1	2.56
Raised beds	25.7	101.1	291	3.7	4.09
LSD	**ns**	**ns (P=0.06)**	**125**	**0.5**	**1.39**

Without the graded drains, yields would have been lower still. Plants grew reasonably well along the edge of the drains but in the middle of the unbedded areas many plants did not survive and growth was poor. In a nearby unbedded paddock (500m away) with no drains, the yield of lupini's was only 1.0t/ha. In contrast the average yield from the lupini crop on beds surrounding the trial was 3.7t/ha.

There was a lot of variation between unbedded replicates so that despite the large difference in height this was not significant. One unbedded replicate was less affected by waterlogging and yielded considerably higher (twice) that of another unbedded plot. This variation will be generally inherent in trials associated with waterlogging and consequently significant differences are less likely.

Conclusions:

The grain yield from raised bed plots was 60% higher than from unbedded plots. Given the very wet winter and the waterlogging intolerance of albus lupins, this result is not surprising. In the two previous relatively dry years wheat and poppy crops in the same trial area have shown no benefit from the raised beds (on a per hectare basis).

It was evident that 50m between drains is too great in wet years and the trial should be repeated with drains placed at closer intervals.