

Legume Crop Testing

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Background

- Increase the number of crops that can be reliably grown in space under narrow band LEDs and elevated CO₂ (~3000 ppm)
- Select crops that address nutritional deficits and meet crew acceptability



Materials and Methods

- ▶ Legume cultivars selected and screen
- ▶ Cultivated in Walk-In Chamber
- ▶ 3000 ppm CO₂, 50% Relative Humidity, 23°C, and PPF ~300μmol m⁻² s⁻¹
- ▶ Samples were harvested
- ▶ Nutritional analysis was conducted by outside lab
- ▶ Samples packaged and shipped to Johnson Space Center Food Laboratory for sensory analysis

Legume Cultivars

Cultivar
PLS 0122
PLS 0120
Antigua
4921
Early Snap Pea/91E
Very Early Snap Pea/351-6-1
Early Snap Pea Thick Pod/404-51-2
Early Snap Pea Thick Pod/404-52-2-1
Early Snap Pea Thick Pod/404-35-1-2-1
Early Snap Pea, Dark Green/412-1-1
Early Snap Pea/430-1-4-1-2
Royal Snap (purple snap)/337-1-1-3
Yellow Snap/485-2
Honey Snap (yellow)/274-1-2-1
Acacia Leaf (snow pea)/299
Mulit Leaf (snow pea)/220-1-2
Royal Snow (purple snow)/99-7-1-1
'Tom Thumb'
'Earligreen'
Blue Bantam Dwarf
Little SnapPea Crunch
Little Marvel
Velour Purple
Feisty pea



Sensory Results

Selected Taster Comments

Cultivar	Average					
	Overall	Appearance	Color	Aroma	Flavor	Texture
Early Snap 2	8.1	7.6	8.3	6.4	8.6	8.2
Early Snap 1	8.0	7.8	8.1	6.8	8.2	8.2
Yellow Snap	7.3	7.3	6.9	6.0	7.4	7.8
Antigua	6.3	7.3	7.7	6.0	5.8	7.0
Royal Snap	6.3	6.3	6.3	6.0	6.1	6.5
4921 Bean	6.1	7.1	7.7	5.7	5.9	6.9
Tom Thumb	5.9	7.1	7.1	5.6	5.3	7.0
Velour Purple	5.5	5.7	5.7	5.2	5.1	6.4

Cultivar	Average				
	Crunchiness	Juiciness	Freshness	Sweetness	Bitterness
Early Snap 2	3.0	3.1	3.0	3.0	3.6
Early Snap 1	3.0	3.1	3.0	3.0	3.1
Yellow Snap	3.1	3.0	3.0	2.7	3.2
Antigua	3.0	2.6	2.9	2.3	3.8
Royal Snap	2.7	2.5	2.8	2.2	3.3
4921 Bean	3.0	2.6	3.0	2.3	3.6
Tom Thumb	3.1	2.7	3.1	2.2	3.9
Velour Purple	3.0	2.4	3.0	2.2	3.7

Early Snap 2

Pros

- Really yummy and appetizing
- Color is excellent.
- Can I please more of these!! So tasty!! Perfect texture and juicy! Seriously, where I can buy some of these? H-E-B? Kroger? A local farmer? ;)

Early Snap 1

Pros

- Great bean!
- Very fresh and juicy
- A perfectly good snap pea! very crisp, very sweet, pretty juicy.
- Liked crispness and nice 'green' flavor.

Yellow Snap

Pros

- These were fantastic!
- Sweet and crunchy
- Good and Fresh

Cons

- Not crazy about the yellow color

Antigua

Pros

- Nice juicy skin
- Crispy and extremely fresh

Cons

- Tastes like soap
- Bitter
- Would prefer cooked

Royal Snap

Pros

- Fresh

Cons

- Flavor too earthy
- Way too dark
- Slightly astringent
- Color was intimidating

4921 Bean

Pros

- Perfectly serviceable bean
- Good color

Cons

- Disliked grassy flavor
- Needed to be cooked
- Seemed bland

Tom Thumb

Pros

- Crisp and fresh

Cons

- Bitter after taste
- Peas difficult to pick up
- Least favorite

Velour Purple

Pros

- Good texture
- Very pretty

Cons

- Slightly tough to chew
- Color was off-putting

Conclusions and Next Steps

- Selected legumes grow well in mission relevant environmental conditions
- Some legumes are palatable to tasters thus far
- Nutritional analysis to be completed on down-selected cultivars

