Table 1- Row spacing and Plant Population

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Row SpacingInches | Pod yield per acre | seed yield per acre | pod # per acre | Moisture% |
|  |  |  |  |  |
| 30 | 2829 a | 643.5 a | 26939 a | 76.0 a |
| 15  | 3251 a | 645.1 a | 29768 a | 75.5 a |

Table 2- Date of Planting and seed size

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Treatments**  | **Pod Yield (lb/ac)** | **Seed Yield (lb/ac)** | **Pod #/ac** | **Moisture (%)** |
|  | **2014** | **2015** | **2014** | **2015** | **2014** | **2015** | **2014** | **2015** |
| **DOP** |  |  |  |  |  |  |  |  |
| Early | 2788a | 2654a | 545a | 978a | 23824a  | 23437a | 73a | - |
| Late | 1598b | 1645b | 518a | 554b | 14257b | 16548 b | 71a | - |
| **Seed Size Group** |  |  |  |  |  |  |  |  |
| Large  | 2867a | 2781a | 614a | 1056a | 39408a  | 34835a | 73a | - |
| Medium  | 2664a | 2537a | 552ab | 1008 a | 36638 a | 32414 a  | 72a | - |
| Small  | 1435b | 1327b | 422b |  490b | 28057b | 17888b  | 72a | - |
| Mixed  | 1805b | 1563b |  538ab |  569b | 31446b | 19906b | 73a | - |

Table 3- Variety Trial and Seed Size

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Treatment  Seed Variety | Seed Size(g/100 seeds) | PFW(lb/ac) | SFW(lb/ac) | Pod#/ac | Seed#/ac |
|  |  |  |  |  |  |
| Bell bean | 51 | 3328c | 1304de | 169365a | 411799a |
| Sweet lorane | 68 | 1831c | 467e | 57530cd | 105920d |
| Early white | 253 | 10582b | 3403c | 77424c | 192431c |
| Aquadulce | 265 | 15107a | 5952a | 116620b | 327923b |
| Early violletto | 280 | 12059ab | 4444bc | 80112c | 224207c |
| Windsor | 311 | 5144c | 1901d | 34948d | 111781d |
| Delle cascine | 335 | 15201a | 4713b | 72047c | 200012c |
| D’Aquadulce | 392 | 5549c | 1611de | 41400d | 65004d |

PFW= Pod Fresh Weight, SFW=Seed Fresh Weight

Table 4- Methods of Planting

|  |  |  |  |
| --- | --- | --- | --- |
| Planting method | DOP | Pod fresh wt. (lb/ac) | Seed fresh wt. (lb/ac) |
|  |  | 2014 | 2015 | 2014 | 2015 |
| Direct | March 30 | 6094ab  | 8329a | 1969ab | 3271a |
| Transplant | Apr 15 | 6792a | 7052a | 2484a | 2507ab |
| Apr 30 | 4759b | 6250a | 1741b | 1754b |

Table 5- Nitrogen Contribution of Fava bean to Succeeding Sweet corn

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Treatment | ME#/ac | MEFW (lb/ac) | EL (inch) | UE (%) |
|  | 2014 | 2015 | 2014 | 2015 | 2014 | 2015 | 2014 | 2015 |
| Fava bean planted on; |  |  |  |  |  |  |  |  |
| Aug/01 | 20969a  | 22421a | 120677a  | 106479a | 6.9a | 6.3a | 5.8a  | 11.1b  |
| Aug/08 | 20162b | 21292a | 113579a | 92283b | 6.9a | 6.1 a  | 7.2a | 16.4 a |
| Aug/16 | 19679c | 19679b | 99381b | 81635b | 7.1a |  6.0a  | 8.5 a | 18.3 a |
| N Rate + FB residue |  |  |  |  |  |  |  |  |
| 0 | 18549a | 15000 b | 88733 | 56789b | 6.9a | 6.1a | 10.0a | 16.4a |
| 25 | 20001a | 22098 a | 113579a | 99381a | 6.9 a | 5.8b | 7.2a | 17.2a |
| 50 | 21775a | 23388 a | 120677a | 106479a | 7.1a | 6.3a | 5.6 a | 14.3b |
| 75 | 21130a | 22259a | 117128a | 99381a | 7.0a | 6.2a | 7.1a | 14.5b |
| 100 | 19840a | 23227a | 113579a | 102931a | 7.0a | 6.2a | 8.6a | 16.1a |

ME#= Marketable ear number, MEFW=Marketable ear fresh weight, EL=ear length, UE%=unfilled ear %

Table 6- L-dopa concentration in fava beans plant parts

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|     | Seedling  | Root  | Stem  | Leaf  | Bud  | Seed  |
| Levodopa(mg g-1)   | 13.3a  | 6.5d  | 3.5e  | 10.5a  | 9.5b  |  7.2c  |

Table 7- L-dopa concentration in fava beans vegetative growth stages

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Bell bean  | Early Violletto  | Aquadulce  | Delle Cascine  | Windsor  | Sweet Lorane  | Early White  | D'Aqua-dulce  |
| (leaf #) | L-Dopa Concentration (mg g-1 ) |
| protrude  | 8.6  | 7.8  | 5.5  | 10.5  | 3.3  | 5.9  | 10.6  | 5.7  |
| 2  | 15.0  | 16.6  | 10.5  | 10.7  | 10.5  | 14.2  | 13.6  | 12.7  |
| 4  | 16.7  | 7.9  | 12.5  | 12.7  | 12.5  | 13.9  | 13.5  | 16.3  |
| 6  | 11.3  | 4.8  | 9.1  | 8.0  | 9.2  | 9.9  | 8.8  | 10.0  |
| 8  | 10.2  | 6.5  | 9.2  | 8.3  | 10.3  | 8.6  | 9.3  | 8.5  |
| 10  | 9.8  | 5.6  | 8.9  | 7.3  | 10.1  | 8.5  | 8.0  | 7.4  |

Table 8. Evaluation among eight varieties for their morphology and susceptibility to the chocolate bacteria

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Seed Variety | 6leaf | flowering | Pod forming | Pod ripening | Height of first pod (inch) | Plant Height (inch) | Chocolate bacteria (%) |
|  |  |  |  |  |  |  |  |
| Windsor | May/13 | June/06 | June/22 | July/07 | 8 | 28.5 | 80 |
| Early white | May/17 | June/19 | June/22 | July/10 | 6 | 16 | 70 |
| Sweet lorane | May/20 | June/19 | July/20 | July/30 | 8.5 | 28 | 80 |
| Delle cascine | May/13 | June/06 | June/22 | July/08 | 7.5 | 22 | 70 |
| Bell bean | May/21 | June/10 | July/03 | July/10 | 9 | 29.5 | 80 |
| Early violletto | May/14 | June/06 | June/22 | July/17 | 4.5 | 21 | 50 |
| Aquadulce | May/13 | June/06 | June/25 | July/09 | 6.5 | 22.5 | 70 |
| D’Aquadulce | May/19 | June/10 | June/25 | July/09 | 7 | 18 | 70 |

|  |
| --- |
| Table 9. Enterprise budget with variable costs for fava beans (Vicia fava) based on research at the UMass Research Farm in 2014-2016. |
| Labor costs/acreEquipment cost |
|  |  Labor hrs($14.00/hr) | Machinery hrs($20.00/hr) |
| Taking soil samples | 0.5 | - |
| Plow | 0.5 | 0.5 |
| Disk | 0.5 | 0.5 |
| Apply lime and fertilizer | 1 | 1 |
| Sowing | 2 | 2 |
| Herbicide application | 1 | 1 |
| Weeding (cultivator) |  15 |  6 |
| Harvest (3 times-total) | 15 |  - |
| Packing | 60 | - |
| Deliver to Wholesaler | 5 | 5 |
| Total hours | 100.5 | 16.00 |
| Total costs (labor and equipment) | $1,407 | $320 |
| Cost of Materials (based on 1 acre) |
| Soil tests (2 times) | $30 |  |
| Seed (110 lb seeds/a @ $3.25/lb) | $360 |  |
| Fertilizer | $100 |  |
| Herbicide |  $120 |  |
| Boxes (500 boxes @ $1.50) | $750 |  |
| Total cost material | $1,360 |  |
| Total costs and returns (based on 1 acre) |
| Labor costs | $1,407 |  |
| Machinery hrs | $320 |  |
| Material costs | $1,360 |  |
| Total costs | $3,087 |  |
| Total returns (based on average of 10,000 lb pods per acre harvested at 3 times @ $1.00/pound) | $10,000 |  |
| Net (Total returns – Total costs) | $6,913 |  |