

Calorie Crops - Sweet Potatoes

November 4, 2008

Why plant sweet potatoes?

The data below was taken from John Jeavon's book "How To Grow More Vegetables". The most efficient calorie crop is the potato. If you have many acres, why worry about space? Crops need watering, weeding, fertility, protection from predators, etc. Managing smaller spaces is easier than large ones.

A mixture of peanuts, beans, and sweet potatoes are the best calorie crops for this area.

| | kCal per lb. | lb. per 100 sq. ft. | kCal per sq. ft. |
|-----------------|--------------|---------------------|------------------|
| Wheat, Hard Red | 1,497 | 4.0 | 59.9 |
| Beans, Pinto | 1,583 | 4.0 | 63.3 |
| Sunflower | 2,790 | 2.5 | 69.8 |
| Peanuts | 2,558 | 4.0 | 102 |
| Potatos, Irish | 279 | 100 | 279 |
| Potatos, Sweet | 375 | 82 | 307 |

It is very difficult to grow the Irish potato sustainably in Central Texas due to the need for the potato to get below 55 degrees F to germinate, and having to store the potato during the hot summer. The sweet potato is similar in caloric and space requirements, it grows during the hot season, and can be stored easily (underground) in our climate through the fall and winter.

While grains are good sources of calories, the growing and processing of these is much more difficult on a homestead sized scale.

Several older Texas (75+ years) recall growing sweet potatoes and storing them in hand dug root cellars lined with hay.

How much to plant? Below are some sample calculations for the area required to grow a substantial amount of calories.

Sweet Potato information from John Jeavons:

| Possible Yield 100 sq.ft. | kCal per pound | Protein Content (g) |
|------------------------------|----------------|---------------------|
| 82, 164, 492 | 375 to 430 | 6.2 to 6.6 |

The different yields above are for various levels of experience and soil quality. Since these soils are poor and our experience low, assume 85 lb/100sq.ft. and 375 kCal/lb.

Assume 45% of diet will come from sweet potatoes. Each person needs a minimum of 2,200 kCal per day.

$$2,200 \text{ kCal/day} * 0.45 = 1,000 \text{ kCal per day per person}$$

For a year:

$$365 \text{ days} * 1,000 \text{ kCal / day} = 365,000 \text{ kCal from sweet potatoes per person.}$$

365,000 kCal per person

$$\frac{365,000 \text{ kCal}}{375 \text{ kCal/Lb.}} = 973 \text{ Lbs. of sweet potatoes per person for a half-year's worth of calories.}$$

With bio-intensive plant spacing, you need 248 plants per 100 sq.ft. bed (plant on 9 in. centers). Sweet potato starts can be easily grown from saved potatoes. A rough estimate is that you can get 10 starts per pound of saved potatoes (based on one year's trial – may be adjusted after more research).

248 starts per 100 sq.ft.

$$10 \text{ starts per lb.} = 24.8 \text{ lb. per 100 sq.ft. needs to be saved for starts}$$

24.8 lb. is approximately 30% of the estimated yield of 85 lb. per 100 sq.ft.

You will need to save approximately 30% for getting starts for next year, so you need to grow $(973 * 1.30) = 1,265 \text{ lbs}$ per person for a year.

$$\frac{1,265 \text{ lbs.}}{85 \text{ Lb. per 100 sq.ft.}}$$

$$= 1,488 \text{ sq.ft. growing space per person.}$$

The 1,488 sq.ft. is only the growing space, and you need room for paths which can be estimated to add 30% to the area. So the total space needed is:

1,488 sq.ft.* 1.3 = 1,934 sq.ft. total space required for one person, 45% of caloric need met by sweet potatoes. It would be wise to increase the planted area by 30%-100% for contingencies.

20 people requires 38,688 of space. For reference, one acre is 43,560 sq.ft.

Notes from the garden:

In 2007 we grew several varieties of sweet potatoes, most of which got predated by gophers. A purple heirloom variety was noticeably untouched. In fact, we saw one large tuber that was bitten into, and left alone. The purple variety was saved and grown for starts in 2008. The 'Sumor' variety of sweet potato is white, not very sweet, and considered a good substitute for an Irish potato. We have grown Sumors twice with no yield, and we are still working to learn why.

In 2008 we grew several varieties with lush foliage and no tuber growth. Below is some of the lessons learned during the last three growing seasons.

The vines of sweet potatoes should be pulled up regularly (every couple of weeks) to prevent the vines from rooting and putting energy into new roots and foliage. Having the vines climb vertically to minimize this rooting and to increase yields is potentially an excellent growing method that needs to be experimented with.

Sweet potato plants do best when stressed for water. Butch Tindell of the Center For Essential Education recommends the plants get to the point of foliage wilting in the afternoon. Heavy watering tends to encourage foliage growth versus tubers.

Sweet potatoes leaves are edible and a good green during the hot summer months. They are a good rabbit food and green during July and August when fresh green grass is in short supply. Growing the leaves as a crop in themselves should be considered.

Sweet potatoes should be grown in very poor, sandy soils. Too much fertility will yield lots of lush foliage, but little or no tubers. Butch Tindell of the Center For Essential Education recommends using sweet potatoes

after a long rotation when the soil is the poorest. In his experience they plant 2 years in alfalfa, then corn, then wheat, then sorghum, then sweet potatoes – before starting with alfalfa again. In trials where the sweet potatoes were planted earlier in the rotation, the yields were noticeably less.

Reflecting on our records, we confirm that our best yields were in the poorest, and driest beds in the garden. And our yields went down as the fertility in our beds increased.

Concerns have been raised regarding using slips from your own saved sweet potatoes for propagation year after year. If your initial stock of slips comes from a good quality heirloom sweet potato source then there should be no problems propagating from your own plants year after year. If you start using commercial sweet potato stock such as the common orange ‘Beauregard’ variety, then problems in tuber size and disease begin after the fourth generation of propagation.