# *Echinacea as a Tobacco Crop Alternative?*

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Tobacco farmers in Wisconsin are looking at some very bleak numbers. For five out of the last 8 years, tobacco allotments have been reduced, this year by 35% and overall by 83% since 1979. With year after year of tobacco base reductions, rumors about the government cutting out the tobacco program, cheap labor in other countries, tobacco farmers are having an increasingly difficult time making up this loss of base, production, and income.

In the past few years, many different alternative crops have made the headlines of various papers and magazines. Some of these articles all but guarantee substantial profits if producers get into growing this alternative crop. Echinacea is one crop that has received some attention over the past year. This paper examines the economics of growing Echinacea as an alternative crop for the tobacco industry in Wisconsin.

**Background:**

There are nine different varieties of Echinacea. With each variety come different considerations that need to be examined before it is planted. For this paper, Angustifolia, Purpurea and Pallida Echinacea were chosen because they are in the highest demand at this time and have the greatest income potential of all the Echinacea species. A producer of Angustifolia Echinacea could expect to harvest about 1125 lbs. of dried roots per acre after three years of growth.[2] Purpurea Echinacea producers could expect to harvest about 1000 lbs. and Pallida Echinacea could expect about 1800 lbs. The expected market value for Echinacea is based on organic production. At this time, Angustifolia Echinacea has a $16 to $17 price per pound and Purpurea Echinacea is worth $2 to $5 price per pound.[3] Currently, the market for Pallida Echinacea is still forming.

Echinacea can be planted by direct seeding or plugs, just like tobacco. There are pros and cons to each method. Direct seeding is less expensive than plugs but is much harder to get established. Echinacea plugs cost more than other plugs because the seed has to be stratified before it can be planted, making it more time consuming to get the seed into the trays.

Growing Echinacea today would be very similar to growing tobacco about 40 years ago because of the organic requirements. Once the plugs are in the ground, great care must be taken in weed control because Echinacea in not a good competitor with weeds.

Harvesting Echinacea would be the area of biggest difference for the average tobacco grower. While tobacco farmers harvest the top of the plant, Echinacea roots are the main harvested part of the plant, unless a market for the tops can be found. Some time

[1] Don Schuster, Outreach Specialist, Dr. Rick Klemme Director of CIAS, both at the Center for Integrated Agriculural Systems, UW-Madison
[2] Price and quantity information from Echinacea Seminar at Department of Ag, Trade, and Consumer Protection. February 12, 1999 - Madison, Wisconsin
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may be needed to adjust a potato digger to go deep enough to harvest Echinacea roots. After the roots are out of the ground, Echinacea roots have to be washed very carefully. Too much soil left on the root or too much bruising will lower the roots' value. Roots can be sold either wet or dry, but most buyers want dried roots. Harvested Echinacea is used as a herbal medicine which has little value if it not grown organically. Time will also be needed to construct boxes to dry roots after they are cleaned. These boxes should have ventilation so that low heat can be forced through the box.

**Assumptions - Equipment:**

With any economic analysis, assumptions need to be made as a reference and as a starting point to compare to real life situations. The following are the assumptions that were used for this paper.

The farm modeled in this paper is based on an average tobacco farm in southern Wisconsin. That is, the farmer has the knowledge to successfully plant, tend and harvest a number of crops.

It was assumed that following would be the only additional equipment needed to grow Echinacea because of the farms existing available equipment, see Table 1.

-one row potato digger (used) $5000
-potato windrower (used) $2500
-drying boxes with a LP heater (homemade and used to dry the roots) $2500
-washing equipment to wash roots before they are dried $1000

***Table 1. Existing equipment set and costs:***

| **Power Unit** | **Main Implement** | **Cost of Implement** |
|---|---|---|
| Tractor 160 hp | sub-soiler | $6367 |
| Tractor 160 hp | field cultivator-28ft. | $11,300 |
| Tractor 60 hp | Cultipacker-12ft. | $2500 |
| Tractor 75 hp | 2 row tobacco planter | $2500 |
| Tractor 40hp | 2 row cultivator | $1500 |
| Tractor 60hp | flail cutter 10ft | $5808 |
| Tractor 160hp | 1 row used potato digger | $5000 |
| Tractor 75hp | used wind rower | $2500 |
| Tractor 60hp | 2 flat rack wagons | $1600 |

**Other Assumptions:**

Echinacea plugs can be planted with a standard 2 row tobacco planter with 30 inch rows, but with an additional 6 people hired to help plant. The six additional hired help are distributed as follows: 4 people on the planter, one person to walk behind to check sets and one person taking care of the plug trays.

Angustifolia Echinacea plugs are purchased at a cost of $0.25 per plug and Purpurea and Pallida Echinacea plugs at $0.20/plug[4]. 12,500 plugs are needed per acre of Echinacea.

Lime is applied at a rate of 2 tons per acre at a cost of $18/ton. No other fertilizer is required.

Because no income will be received for 3 years, a 12% interest rate is assumed for input expenses.

Harvested Echinacea is used as a herbal medicine which has little value if it not grown organically. For this reason, it was assumed that the crop is planted on old tobacco field in hopes of a smaller weed bank. Hand hoeing is required and calculated at 160 hours per acre, at $7.35/hour, over the three-year period. This is broken into 80 hours during the 1st year, 50 hours in the 2nd year and 30 hours in the final year.

Organic certification costs equal $225 per year plus 1% of gross sales.

The potato digger requires six extra people to operate the equipment. Also, 35 hours of labor per acre is assumed in the budget for washing and drying of the roots.

Energy expenses total $217.69 per acre, broken down as follows: Gasoline, $40.36, Diesel fuel, $21.11, Propane, $147.00 and engine lubrication at $9.22.

Repair and maintenance expenses equal $170.90/acre.

Marketing and other miscellaneous costs equal $200/acre for the three years.

A charge for land and taxes has been omitted from this budget. The budget was constructed this way because of the difficulty getting a consensus on the land value. If this information is used for a specific farm, then deduct land rent and taxes from the net returns of the budget to come up with an accurate number.

Lastly, it is assumed that 1125 lbs. of dried Angustifolia Echinacea roots, 1000 lbs. of Purpurea Echinacea and 1800 lbs. of Pallida Echinacea were harvested per acre.

**Results:**

Angustifolia Echinacea dried roots were worth about $16/lb at the time of this report. With the assumptions made in this report, Angustifolia Echinacea would return $3766 per acre per year to land and management or $11,298 for the three year period.(see Table 2)

Purpurea Echinacea dried roots were worth about $2/lb at the time of this report. This is a price drop of $8/lb form just a year ago.[5] With the assumptions made in this report, Purpurea Echinacea would be worth a negative $1506 per acre per year resulting in a loss of $4518 over the three year period (see Table 3).

[4] Price quoted for plugs from Steve Birkinbine, Director, Division of Native Plants of Agricole, Sun Prairie, WI

[5] Price quoted from Barbara Letchworth, Frontier Herbs, Norway, Iowa

Dried Pallida Echinacea roots have no market at the time of this report. Pallida Echinacea has many of the same characteristics as Angustifolia Echinacea, so one could see a market in the future.[6] Pallida Echinacea in better suited for Wisconsin's growing conditions then Angustifolia Echinacea and has a better opportunity for production. At only $4/lb, Pallida Echinacea will still return $207 per acre per year to land and management or $621 for the three year period.(see Table 4)

The breakeven point for the three types of Echinacea are as follows:

Angustifolia = $5.84/lb
Purpurea = $6.57/lb
Pallida = $3.65/lb

***Table 2. Angustifolia Echinacea net returns to land and management per acre per year over a range of prices***

| $/lb. | $2 | $4 | $6 | $8 | $10 | $12 | $14 | $16 | $18 |
|---|---|---|---|---|---|---|---|---|---|
| $/ac/yr | $-1424 | $-683 | $59 | $800 | $1542 | $1651 | $3024 | $3766 | $4507 |

***Table 3. Purpurea Echinacea net returns to land and management per acre per year over a range of prices***

| $/lb. | $2 | $4 | $6 | $8 | $10 | $12 | $14 | $16 | $18 |
|---|---|---|---|---|---|---|---|---|---|
| $/ac/yr | $-1506 | $-847 | $-188 | $471 | $1130 | $1789 | $2448 | $3107 | $3766 |

***Table 4. Pallida Echinacea net returns to land and management per acre per year over a range of prices***

| $/lb. | $2 | $4 | $6 | $8 | $10 | $12 | $14 | $16 | $18 |
|---|---|---|---|---|---|---|---|---|---|
| $/ac/yr | $-979 | $207 | $1393 | $2580 | $3766 | $4952 | $6138 | $7324 | $8511 |

**Consideration:**

If you are interested in growing Echinacea, beware of the risk that could accompany it. Some of the risks are associated with varieties, seed stock identifications, price and yields. There are nine different kinds of Echinacea and some do not command a very high price or are much harder to grow than some of the others. For Example, Angustifolia is very hard to grow in heavier soils, it does much better in sandy soils.

If you buy seed stock, are you sure that you are getting what you are paying for? There was much talk at the 1999 Echinacea Seminar that what you think is Angustifolia Echinacea could really be something else which could be very traumatic if you find this out in the 3rd year. In addition, prices can be very volatile. Barbara Letchworth, a buyer from Frontier Herbs, said "Angustifolia Echinacea is worth $17 a pound today but may only be worth $2 a pound tomorrow." Is this something that you can live with? Lastly, Echinacea has to be grown organically in hope of getting the highest price. If growing a crop organically for the 1st time, do you feel confident that you can get the higher yields that you could with conventional management? Plus, you need to have land that is certified organic, a process that requires three years of using inputs allowed under certification.

[6] Echinacea: Botany and Chemistry Identification, By Tang-Sheng Peng, Ph.D., Laboratory Director, Nature's Herb, Inc.: Whole Foods/February 1997 p. 62

Keep growing tobacco as long as it is profitable to grow it. Or in other words, don't quit your day job. Growing tobacco can help reduce some price risk because of price support. Growing Echinacea is new, and many things need to be learned before a producer would feel comfortable in the Echinacea market. A beginning grower needs: suitable seed stock, the knowledge about how to plant the crop, how to tend it, how to harvest it and probably most importantly, how to market it.

Marketing Echinacea is very different than marketing tobacco. Everyone that this researcher interviewed said that you need to start finding a market six months before the crop ever comes out of the ground. This means getting on the phone, on the Internet, and getting letters out to find someone who is interested in your produce. Make sure to find out what form the buyer wants the produce in, ground up or in tack, wet or dried down. Some companies have very high standards and you need to know this before the roots come out of the ground so that you can meet these standards and get the highest price. Also, as in any market ventures, make sure your buyer's financial condition is stable and that the buyer can be trusted.

Echinacea has to be grown organically to demand the best prices. For most tobacco growers in the state of Wisconsin, this could be the biggest hurdle to over come. If you want to get into alternative markets, your mind set may have to change. Producers need to keep in mind that the final product is going to be used as a medicine and, because of that fact, a producer has to keep in mind how to keep the process clean. The open-air drying of tobacco is different than drying process of Echinacea. With organically grown crops, more attention to detail must be observed, and this doesn't mean only in the field but also with the paper work that goes with growing organic crops.

**Conclusion:**

Going from growing tobacco to growing Echinacea could prove to be very profitable for some growers. Making $3766 per acre with Angustifolia Echinacea looks better than any corn or soybean budget that you will find anywhere. But, there are risks, mainly from price fluctuation, marketing strategies and organic farming practices that play into this equation. This is not an endeavor to go into lightly. To grow Echinacea will take a lot of work and up front capital before any gains will be seen. Lastly, someone interested in growing Echinacea needs to do their own research before one Echinacea plant ever goes into the ground to make sure they know what they are getting themselves into and are not surprised along the way.

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