Heron Pond Farm

From Steam to Steel: System Approaches to Weed Management

Heron Pond Farm

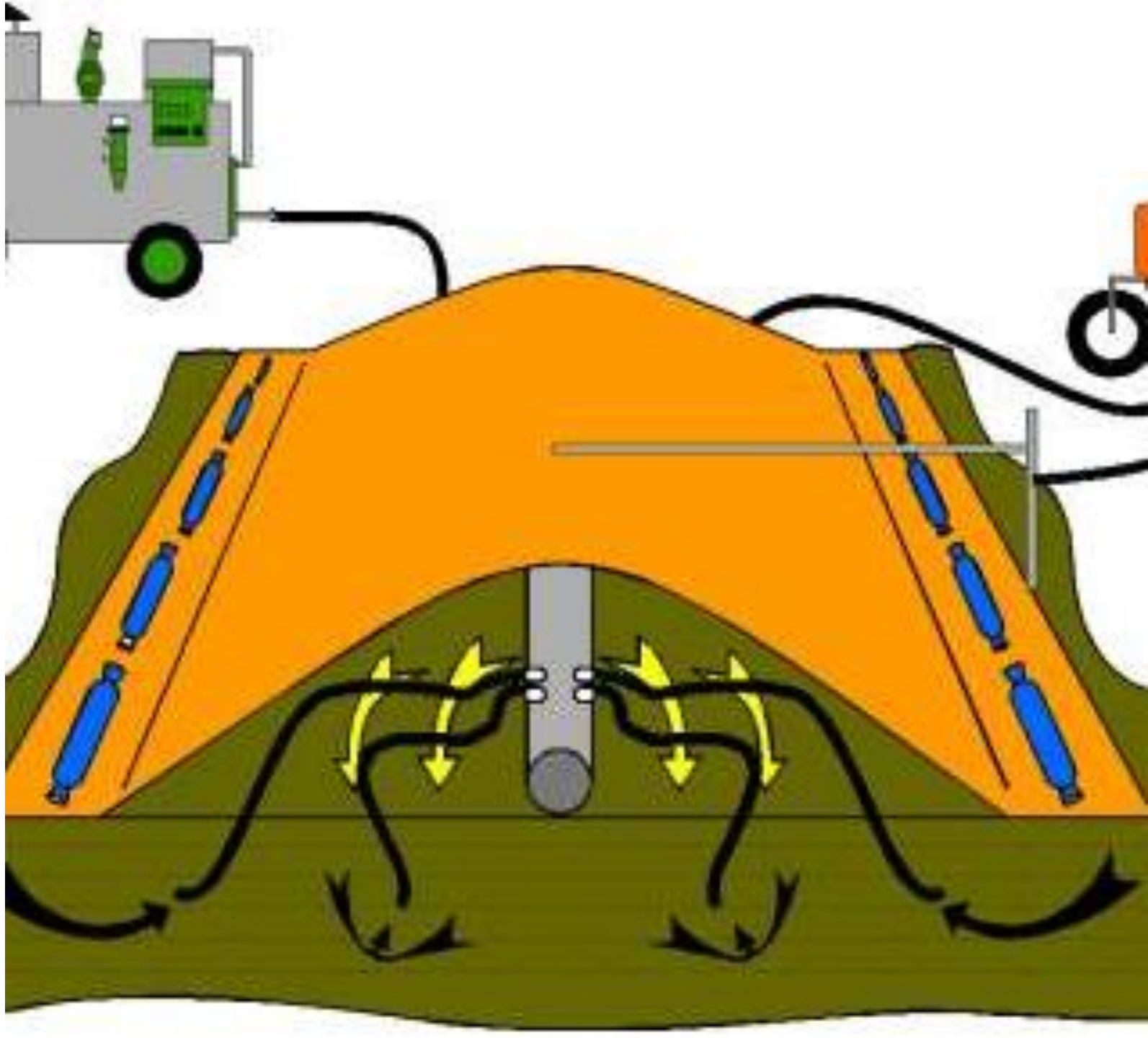
South Hampton, NH

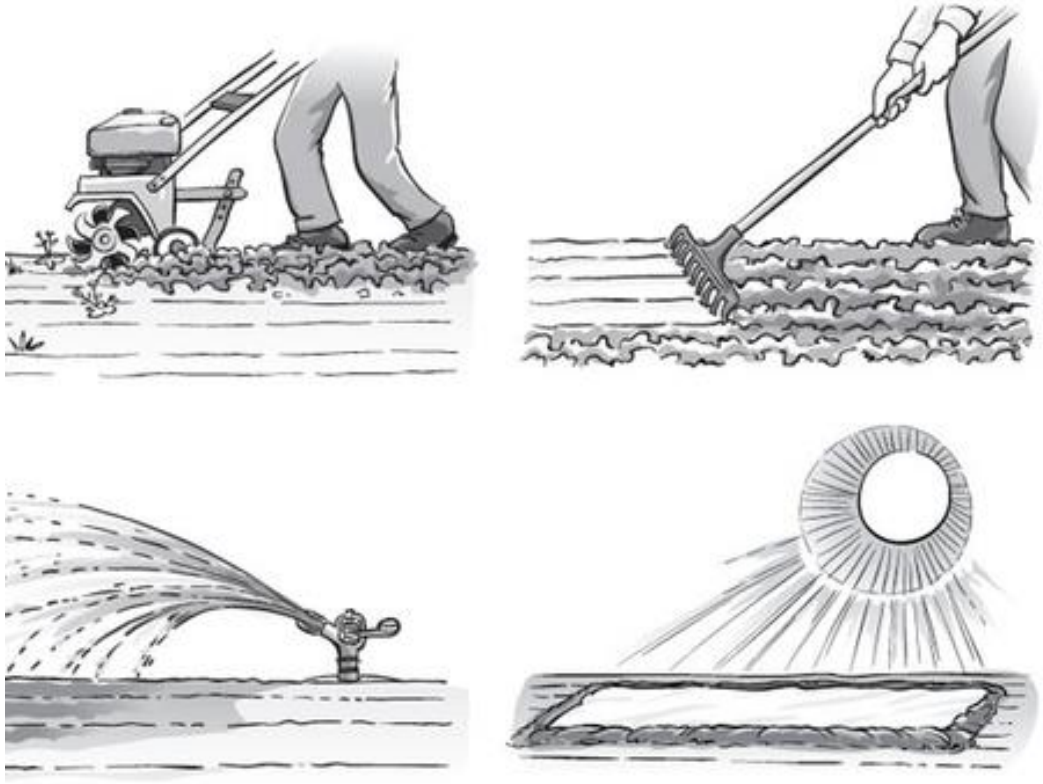
42.8809° N, 70.9626° W

When the weeds get this bad you are better off not growing!

General soil steaming set up

- Heat tube carries steam supply down entire length of treated area.
- Sides must be weighted down the entire way. No gaps. We use chain.
- Do not take test temp at beginning or end of run.
- Do not take test temp from middle or against weighted side of bed.





Bed prep is done prior to treatment.

- Deep and/or finish tillage will bring up viable weed seed.
- Smoothing off will allow not only for a better seed bed but for more consistent heating of soil bed.
- Watering for heat conductivity and retention. Soil must still be friable. Over saturation leads to uneven heat and unobtainable BTU load. Soil moister should be 25%.
- Use of a power harrow post watering will aid in optimal treatment conditions.

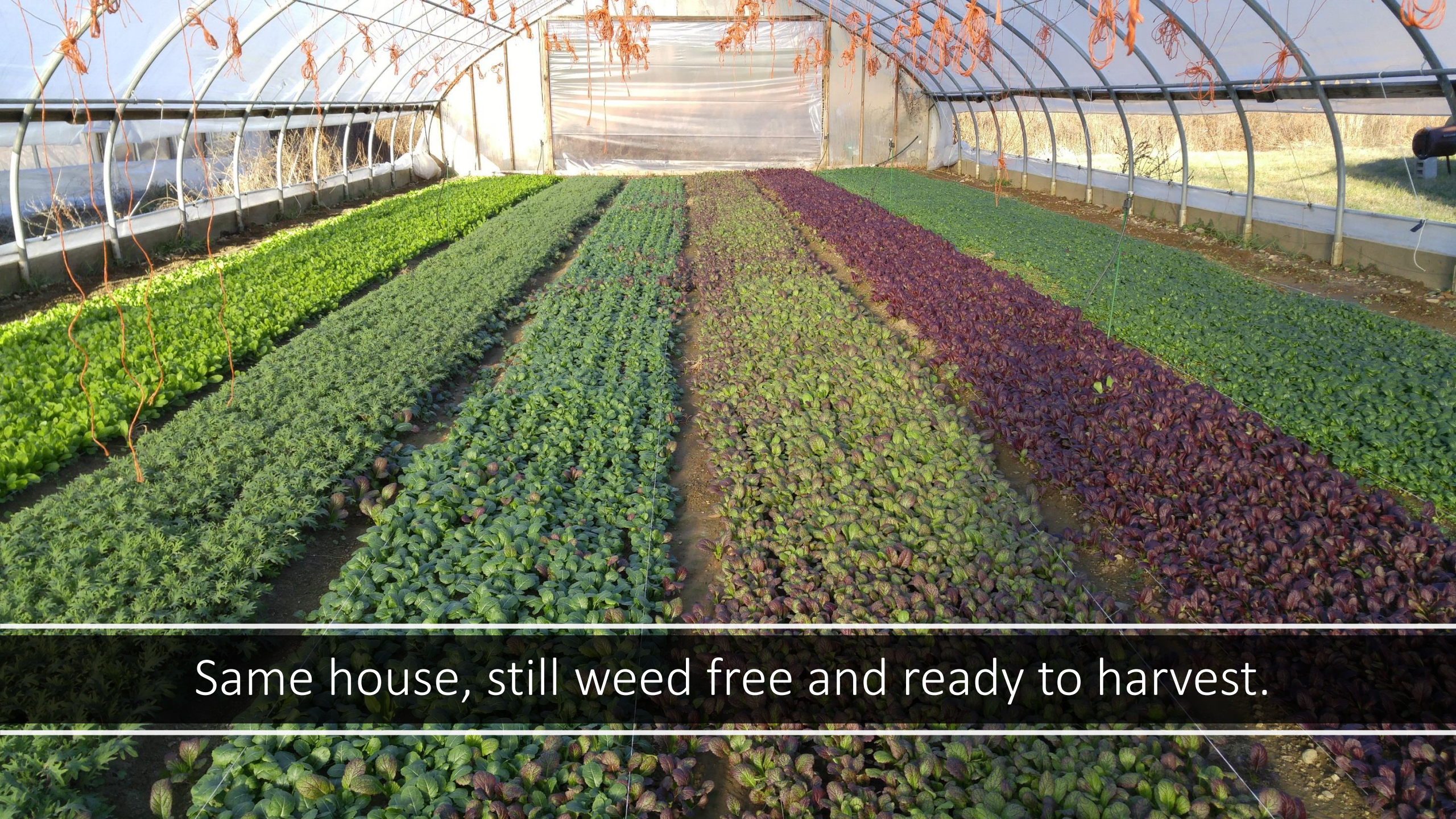

We use mini wobblers to water our prepped and leveled beds.

Sioux Model SF-20 Steam-Flo

- 20 Boiler HP (15 Boiler KW)
- 690 Lbs/Hour Steam Output (313 Kg/Hour Steam Output)
- 791,000 BTU/HR Input
- 15 PSI Maximum Operating Pressure (1.03 BAR Maximum Operating Pressure)
- 115V/1PH/60Hz Operating current 5 amps
- Oil fired burner (Diesel fuel or kerosene) with flame safe guard
- Fuel filter with water separator


Grommet holes in woven hose let out more steam.

Baby greens coming up well and weed free.



Same house, still weed free and ready to harvest.

Steaming turned an unprofitable house from this…

To this!

In the field we were looking for the magic tool that would turn this….

Into this…

Cleaning rocks from field

- Area on left raked and picked.
- Area on right unpicked, smoothed of with perfecta harrow.
- Center is windrow that will be sifted by rock picker.
- Adds considerable time to field prep,
- but it should be done on our farm anyway.

Seed beds laid out

- Beds are relatively stone free.
- Nice straight beds aid with cultivation even with a steerable cultivation system.
- Flat bed tops make for generally even and level seedling emergence.

Flame Weeding Beds 6,000,000 BTU

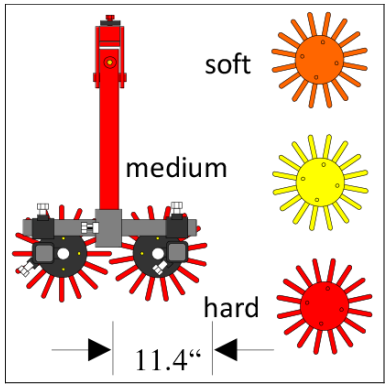
Two side sweeps with different action

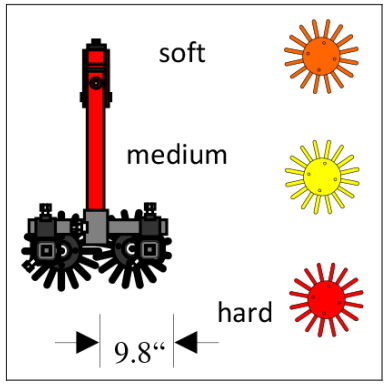
Down cut sweep: minimal soil movement, perfect for direct seeded stuff.

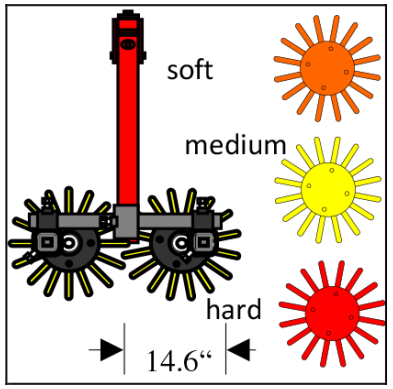
Up cut Sweep: Moves soil, will bury direct seeded stuff, lift arm is smooth so you don’t pull transplants out.

Choose the proper finger size and hardness for what you want to do

- **The Medium Fingerweeder**
  (Ø 11.4”) is recommended for row distances from 15.75-21.65” for sugar beets, soybeans und leek.
- **The Small Fingerweeder**
  (Ø 9.84”) is recommended for row distances from 9.84 – 13.78” for salad and tree nursery cuttings.
- **The Large Fingerweeder,**
  (Ø 14.6”) is recommended for row distances from 19.69”, for strawberries, cabbage, maize, tobacco and tree nurseries.







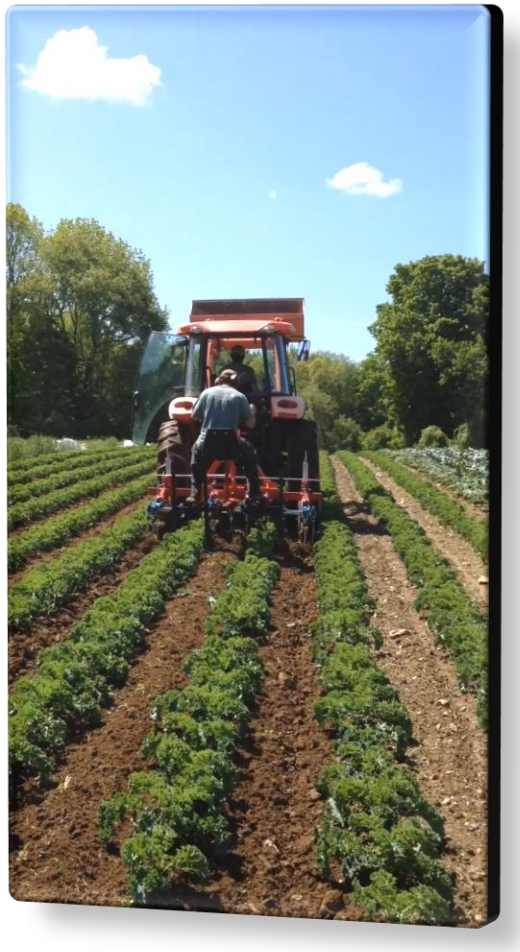
Direct seeded crop cleaned up with Down Cut Sweeps

- Rocks will catch in fingers and wipe out strips of crop fast.
- Correct finger size is key to getting good in-row cultivation without lifting crops out of ground.
- Hardness of fingers is dictated by soil type. And small crops will benefit from softer fingers.

Steering function is key to close cultivation of fine seeded crops.

- Proper center link length is needed to control down pressure of fingers.
- Center link length can effect steering. Be sure to balance any moves made at center link with corresponding moves on drive wheels.
- Rocks will effect the steering system on the Kress. Making you jump into your crop. Always at the worst time.

Kale Cleaned up with Up Cut Sweeps



Shallow action of Kress sweeps can “replant” weeds after cultivation

Sweeps undercut weeds, fingers mix them up!

- Note that the soil conditions are not ideal for cultivation.
- Shallow sweeps are up rooting weeds but placing them down in a soil clump.
- Finger Weeders are mixing the soil.
- It’s not just the rubber fingers that provide action, the drive component of fingers mix soil as well.


Sweep action through soil. Getting tons of weed threads, but leaving more established weeds behind.

Result difference between fingers and shallow sweeps.

Sweep rakes disturb soil clumps

- Attach directly to sweep arm.
- Hinged to allow for hopping action.
- Weights control amount of action. Close to sweep less action, further away more.
- Tines are adjusted with 13 mm wrench.
- Can be welded in place if you have one standard set up. This will stop tines from shifting.

Shallow sweeps with rakes “tool stacking.”

Weeds left replanted by sweeps.

Rakes have now flipped those weeds over.

Highly effective one pass cultivation.

Finished product weed free and ready for harvest

- Proper down pressure on fingers makes for better action.
- Shallow sweeps reduce the amount of “new” weed seed brought up.
- “Tool Stacking” with fingers, sweeps, and rakes allow for more effective one pass weed control.
- How fast? Faster then you think. Our last passes can be at 4 MPH!
- No tool can replace proper cultivation timing.
- No tool can put your butt in a tractor seat.

I have a $13,000 cultivator, why can’t I get great weed control?

- Area on right was cultivated three days before area on left.
- It had rained in between cultivation days.
- Cultivations were done by two different operators.
- Tools can not change environmental conditions.
- Tools can not pick their operators, nor “choose” to be used correctly.
- Beds on left needed a steeper down angle on fingers, faster ground speed, and the addition of sweep rakes.

Conclusions

The steep learning curve will scare folks away from this weeding system. Spending some time wiping out crops is no fun. Taking the time to learn and invest in this system can pay off in better all around weed control. The adaptability of this tool will allow for reduction in the need for other weeding equipment. Nothing will replace or change the fact that timely cultivation is the best tool in our tool box. We have found that when we do make the effort to get out there when we can, it is nice to have the most effect tool for the job and get the best bang for our buck.

Contact Information

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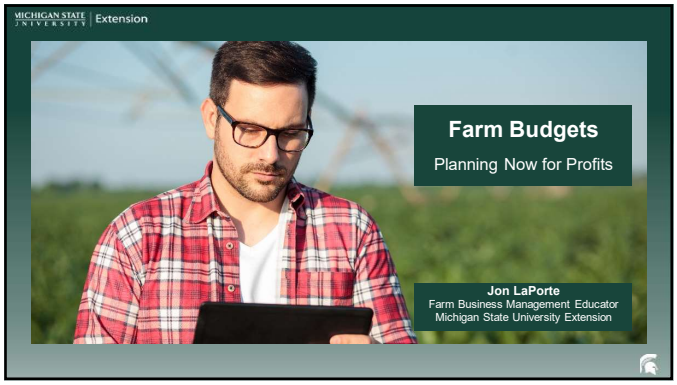
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Farm Budgets
Planning Now for Profits
Jon LaPorte
Farm Business Management Educator
Michigan State University Extension

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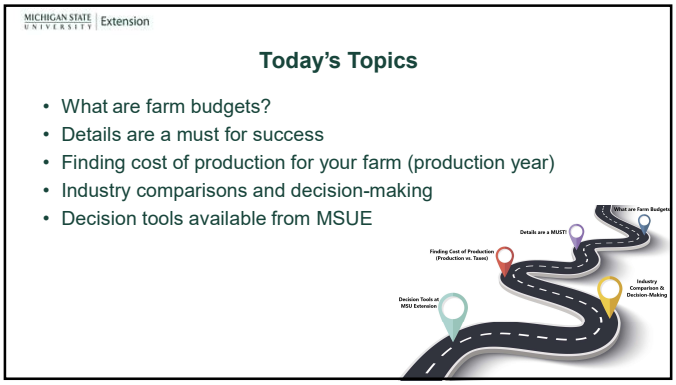
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Today's Topics
What are farm budgets?
Details are a must for success
Finding cost of production for your farm (production year)
Industry comparisons and decision-making
Decision tools available from MSUE

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What are Farm Budgets?
Goals for the year
(Production and Financial Achievements)
Reflection of farm's capabilities and concerns
(Strengths and Weaknesses)
Reasonable and accurate expectations
(Historical "Cost of Production" and Industry Comparisons)
Outline of the path to success
(Can't See Where You're Going If You Don't Know Where You've Been)

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Details are a MUST for Success
Farms pay attention and track production details (Why?)
Understand farm's abilities (production history and potential)
Recognize areas of concern (limitations to reaching potential)
Plan to address concerns and improve performance

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Details are a MUST for Success
Same reasons apply to tracking details in farm records
Understand what the farm has been able to achieve
(Profitability, Cash Flow, Growth of Business)
Details mean you can compare accurately to industry
(Identify Areas of Concern)
Your records are the foundation to this year's farm plan
(Detailed Records Provide a Guide)
Farm Records Book
For Management

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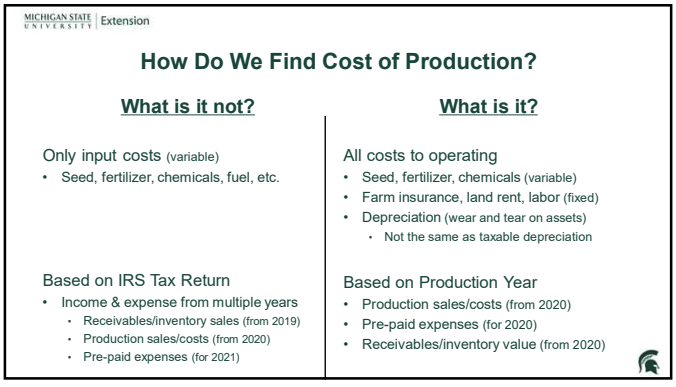
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How Do We Find Cost of Production?
What is it not?
Only input costs (variable)
Seed, fertilizer, chemicals, fuel, etc.
Based on IRS Tax Return
Income & expense from multiple years
Receivables/inventory sales (from 2019)
Production sales/costs (from 2020)
Pre-paid expenses (for 2021)
What is it?
All costs to operating
Seed, fertilizer, chemicals (variable)
Farm insurance, land rent, labor (fixed)
Depreciation (wear and tear on assets)
Not the same as taxable depreciation
Based on Production Year
Production sales/costs (from 2020)
Pre-paid expenses (for 2020)
Receivables/inventory value (from 2020)

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How do we go from taxes to production year?

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Sweet Corn Example (5-acre farm)

Actual

	+ Pre-paid (2019) for 2020	+ In Year (2020) Cash Transaction	- Pre-paid (2020) for 2021	= Actual 2020 Total Expense	Cost/Acre
Seed	$ 500.00	$ 1,050.00	$ 600.00	$ 950.00	$ 190.00
Nitrogen	$ 300.00	$ 425.00	$ 250.00	$ 475.00	$ 95.00
	Balance Sheet	Income Statement "Tax Return"	Balance Sheet		

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Planned

	Pounds/Acre	Price/Pound	Cost/Acre
Seed	15.00	$ 12.00	$ 180.00
Nitrogen	240.00	$ 0.40	$ 96.00

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Sweet Corn Example (5-acre farm)

Actual

- 12/31/2019 Accts Receivables	+ Sales In Year (2020)	+ 12/31/2020 Accts Receivables	= Actual 2020 Total Income	Gross Income/Acre	Crates/Acre	$/Crate
$ 2,000.00	$ 14,500.00	$ 2,500.00	$ 15,000.00	$ 3,000.00	320.00	$ 9.38
Balance Sheet	Income Statement "Tax Return"	Balance Sheet				

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Planned

	$/Crate	Crates/Acre	Gross Income/Acre
Income	$ 9.00	340	$ 3,060.00

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Farm Records... **MUST HAVE DETAILS!!!**

Expenses

- Seed — can't just be "seed"
  - Seed "cucumbers"
  - Seed "pumpkins"
  - Seed "sweet corn"
- Fertilizer — can't just be "fertilizer"
  - Fertilizer "cucumbers"
  - Fertilizer "pumpkins"
  - Fertilizer "sweet corn"

Income

- Sales — can't just be "sales"
  - units sold (dozen, crates, cwts)
  - price received

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Comparison to the Industry

How can we use budgets and industry comparisons to make decisions?

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Where Do We Get Industry Comparisons?

finbin.umn.edu/

Fruit and vegetable growers needed to build the database

Contact MSU Extension's Farm Business Management Team

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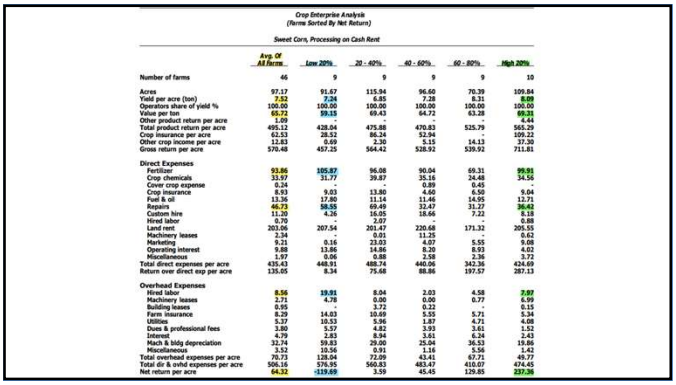

Crop Enterprise Analysis
(Farms Sorted By Net Return)

Sweet Corn, Processing on Cash Rent

	Avg. Of All Farms	Low 20%	20 - 40%	40 - 60%	60 - 80%	High 20%
Number of farms	46	9	9	9	9	10
Acres	97.17	91.67	115.94	96.60	70.39	109.84
Yield per acre (ton)	7.52	7.24	6.85	7.28	8.31	8.09
Operators share of yield %	100.00	100.00	100.00	100.00	100.00	100.00
Value per ton	65.72	59.15	69.43	64.72	63.28	69.31
Other product return per acre	1.09	-	-	-	-	4.44
Total product return per acre	495.12	428.04	475.88	470.83	525.79	565.29
Crop insurance per acre	62.53	28.52	86.24	52.94	-	109.22
Other crop income per acre	12.83	0.69	2.30	5.15	14.13	37.30
Gross return per acre	570.48	457.25	564.42	528.92	539.92	711.81
Direct Expenses						
Fertilizer	93.86	105.87	96.08	90.04	69.31	99.91
Crop chemicals	33.97	31.77	39.87	35.16	24.48	34.56
Cover crop expense	0.24	-	-	0.89	0.45	-
Crop insurance	8.93	9.03	13.80	4.60	6.50	5.04
Fuel & oil	13.36	17.86	11.14	11.46	14.95	12.71
Repairs	46.73	58.55	69.49	32.47	31.27	36.42
Custom hire	11.20	4.26	16.05	18.66	7.22	8.18
Hired labor	0.70	-	2.07	-	-	0.88
Land rent	303.06	207.54	301.47	220.68	171.32	295.55
Machinery leases	2.34	-	0.01	11.25	-	0.62
Marketing	9.21	0.16	23.03	4.07	5.55	9.08
Operating interest	9.88	13.86	14.86	8.20	8.93	4.02
Miscellaneous	1.97	0.56	0.88	2.58	2.36	3.71
Total direct expenses per acre	435.43	448.91	488.74	440.06	342.36	424.69
Return over direct exp per acre	135.05	8.34	75.68	88.86	197.57	287.13
Overhead Expenses						
Hired labor	8.56	19.91	8.04	2.03	4.58	7.97
Machinery leases	2.71	4.78	0.00	0.00	0.77	6.99
Building leases	0.05	-	3.72	0.22	-	0.15
Farm insurance	8.29	14.03	10.69	5.55	5.71	5.34
Utilities	5.17	10.53	5.96	1.87	4.71	4.08
Dues & professional fees	3.80	5.57	4.82	3.93	3.61	1.52
Interest	4.79	2.83	8.94	3.61	6.24	2.43
Mach & bldg depreciation	32.74	59.83	29.00	25.04	36.53	19.86
Miscellaneous	3.52	10.56	0.91	1.16	5.56	1.42
Total overhead expenses per acre	70.73	128.04	72.09	43.41	67.71	49.77
Total dir & ovhd expenses per acre	506.16	576.95	560.83	483.47	410.07	474.45
Net return per acre	64.32	-119.69	3.59	45.45	129.85	237.36

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How Do Industry Comparisons Help Make Decisions?

Identify Problem Areas

Revenue:

- Are we getting similar production? (bushels, cwt., tons, pounds)
- Are we getting similar prices?

Expenses:

- Are we spending more in expenses? (land rent, feed, labor, fertilizer)
- Are we not spending enough? (fertilizer, chemicals, feed, labor)

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If Problems Exist, How Do We Make Changes?

Time to consult with the farm's "Management Team"

Who's on Your Farm Management Team?

Agronomist
Nutritionist
Marketing Specialist (grain originator, sales broker)
Farm Lender
MSU Extension Educator(s)

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Decision Tools Available from MSU Extension

Crop Budgets

- Crop budget estimator tools:
  - Field crops & forages (simple & detailed)
  - All crops (simple only)
- Greenhouse cost of production worksheet
- Nursery cost of production worksheet

Livestock Budgets

- Livestock budget estimator tools
  - Dairy, Beef, Swine, Swine Contractors
- Cow-calf enterprise budget tool
- Feedlot enterprise budget tool

Decision Tools Available at:
www.canr.msu.edu/farm_management/budgets-cost-of-production

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Assistance Available from MSU Telfarm & Extension

"MSU Telfarm is an educational service program designed to assist farmers with their farm financial records and decision making."

Program participants:

- Receive recordkeeping support
- Obtain a financial analysis to compare against the industry
  - Converting IRS Tax records into Production level viewpoint
- Can contribute to FINBIN benchmarking database

For more information visit:
www.canr.msu.edu/telfarm

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Farm Budget Resources

- FINBIN - finbin.umn.edu/
- Decision Tools - www.canr.msu.edu/farm_management/budgets-cost-of-production
- Telfarm - www.canr.msu.edu/telfarm

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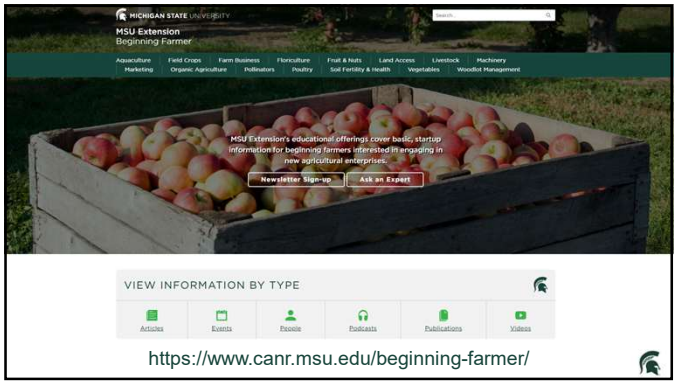

https://www.canr.msu.edu/beginning-farmer/

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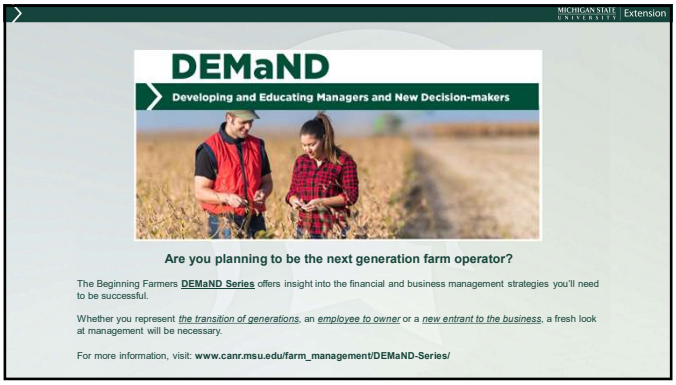

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