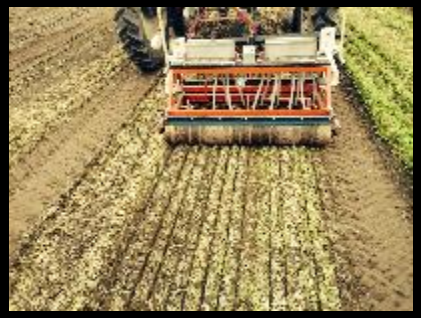
Leafy Green Production

Using a Systems Approach from Seed to Market

Tom Thornton, Charlene Grahn, Carol Miles & Chris Benedict

Project Partners

Washington State University

WSDA Washington State Department of Agriculture — Specialty Crop Block Grant Program

Cloud Mountain Farm Center — community | education | sustainability

NABC northwest agriculture business center

Community Food Co-op Farm Fund

Whatcom Community Foundation

College of Agricultural, Human, and Natural Resource Sciences — CAHNRS COUGS

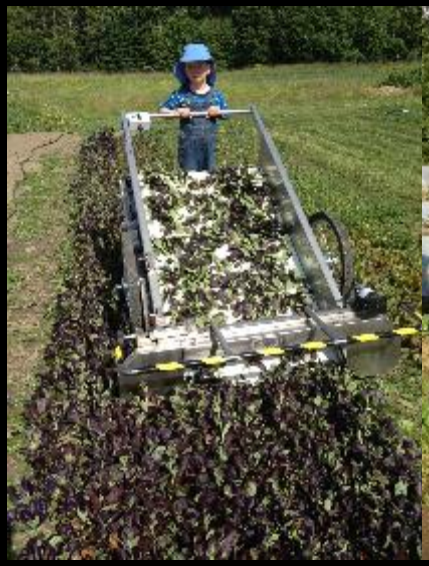
Participating Farms

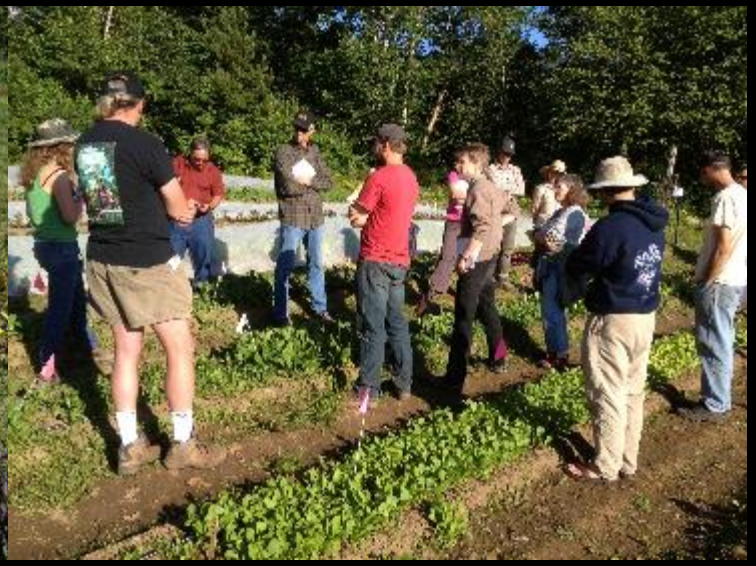
- Carrot and Stick Farm
- Cedarville Farm
- Cloud Mountain Farm Center
- Moondance Farm
- Rabbit Fields Farm
- Red Mountain Farm
- Sage and Sky Farm
- Red Mountain Farm
- Terra Verde Farm

Project Goals

Build an organic salad green production system that targets larger institutional markets and maintain or improve profitability

Engage market farmers in evaluating new production strategies and equipment

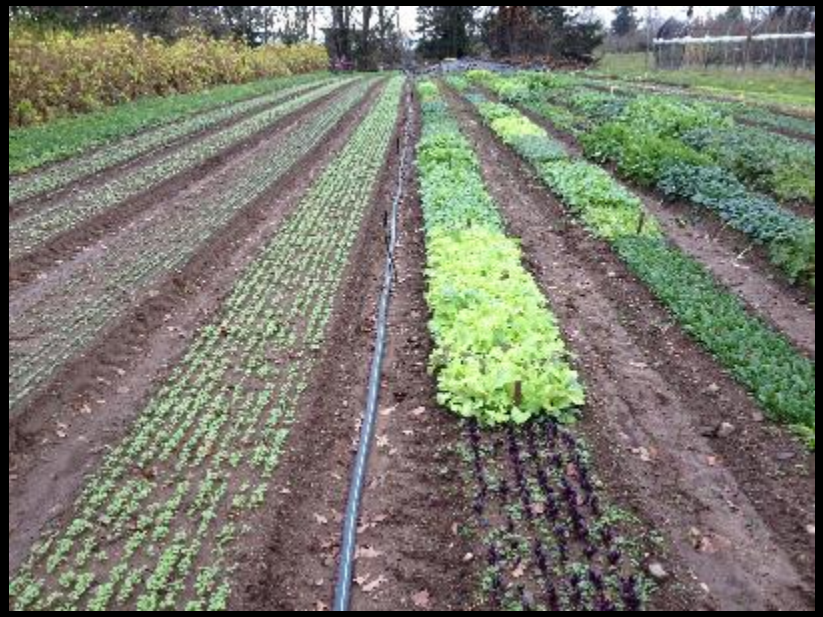




Have farmers adapt new strategies into their production operations

Field Research Objectives

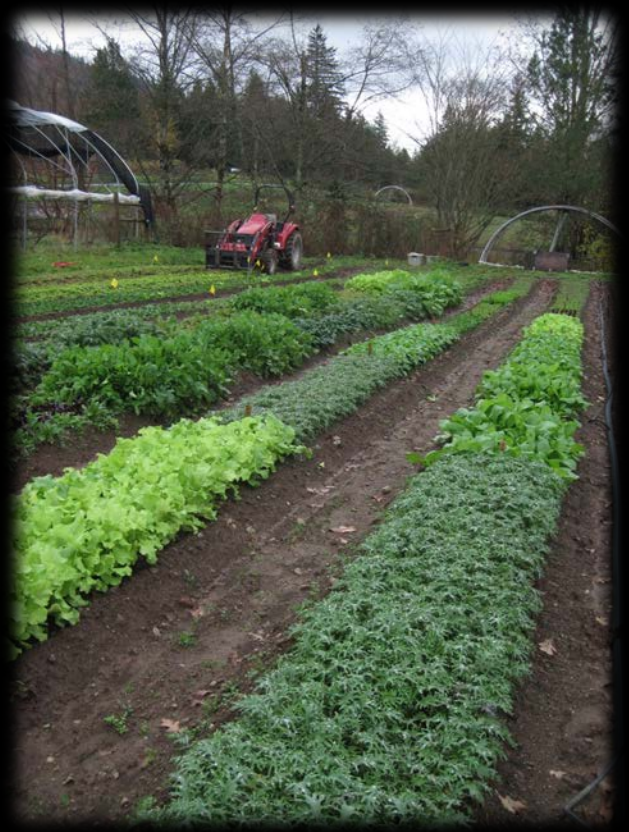
- Identify leafy green varieties that are well suited to fall, winter and spring production
- Evaluate leafy greens for suitability for salad mix and braising mix



Field Research Objectives

- Develop production recommendations for open field production

- Reduce cost of production with introduction of appropriate scale mechanized equipment



Current Situation in NW Washington

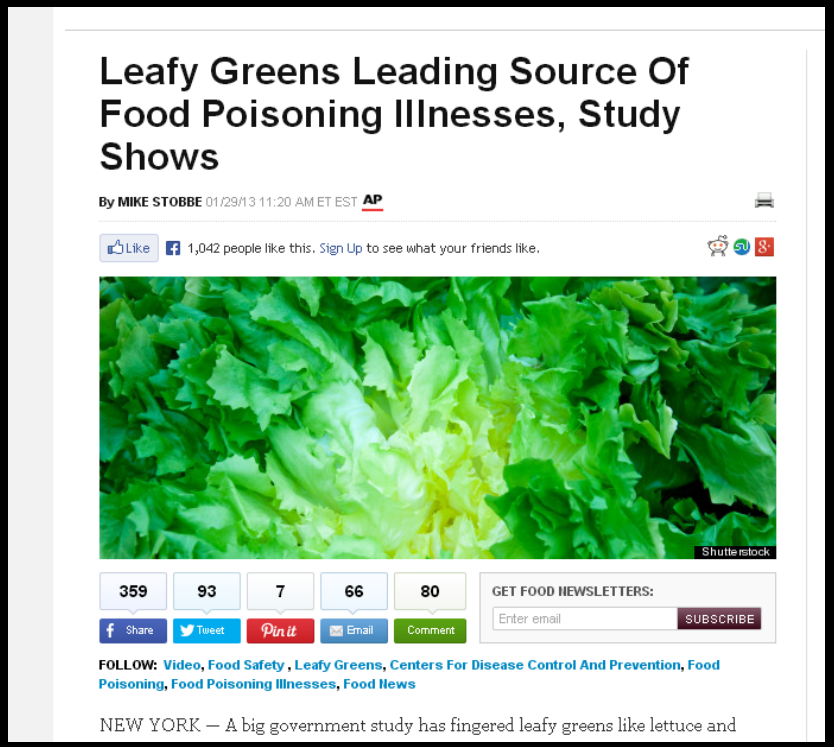
Current Market Situation

- Directly marketed extensively through farmers markets, CSA's and Food Co-ops
  - Market demands product year round
  - Wholesale pricing: $3.75-$5.00/lb
  - Cost of production est: $4.00-$5.00/lb

Current Production Issues

- Lack of current technology exposure in region

- Farmer's lack food safety plans required by wholesale markets
- Delivery systems to move production into larger institutional markets



Leafy Greens Leading Source Of Food Poisoning Illnesses, Study Shows

By MIKE STOBBE 01/29/13 11:20 AM ET EST AP

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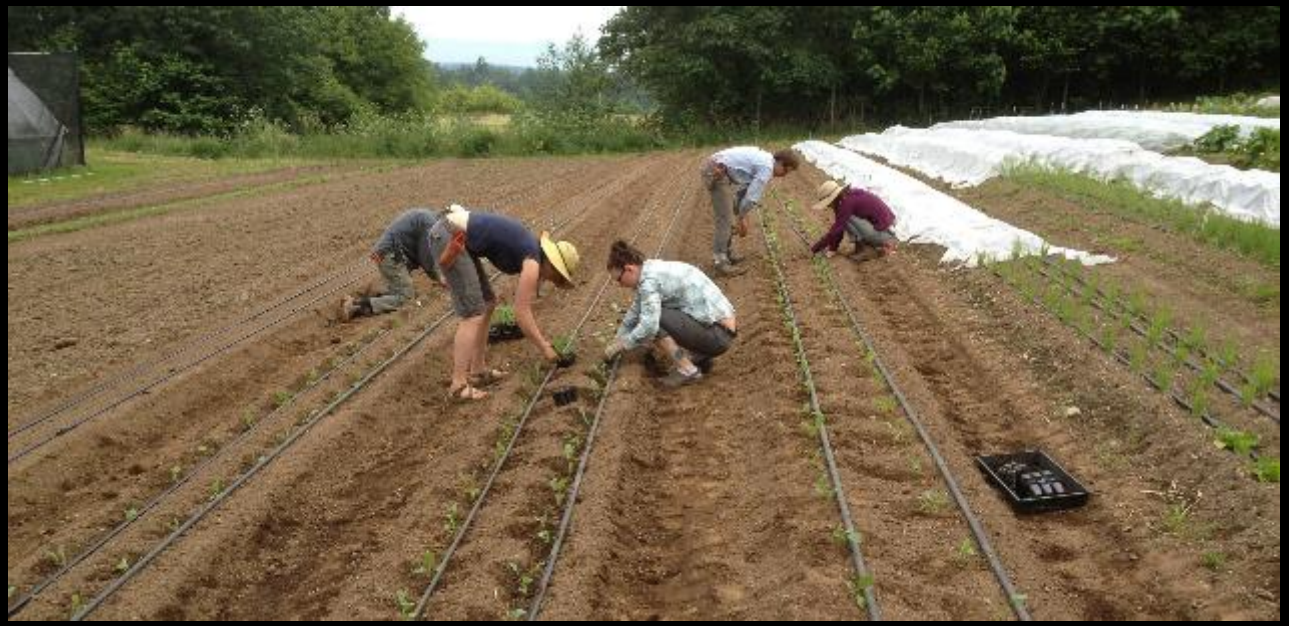
NEW YORK — A big government study has fingered leafy greens like lettuce and

Current Leafy Green Production Practices

- Seeding into flats
- Daily watering flats
- Transplanting in the field
- Hoe/hand weeding to harvest
- Hand harvesting- full head or multiple harvests
- Hands touch every plant multiple times



Current Seed to Harvest Intervals

Spring Mix:

- 15 - 28 days to transplant
- 18 - 28 days to harvest
- 33 - 56 days per rotation

Lettuce:

- 30 - 35 days to transplant
- 35 - 40 days to harvest
- 65 - 75 days per rotation

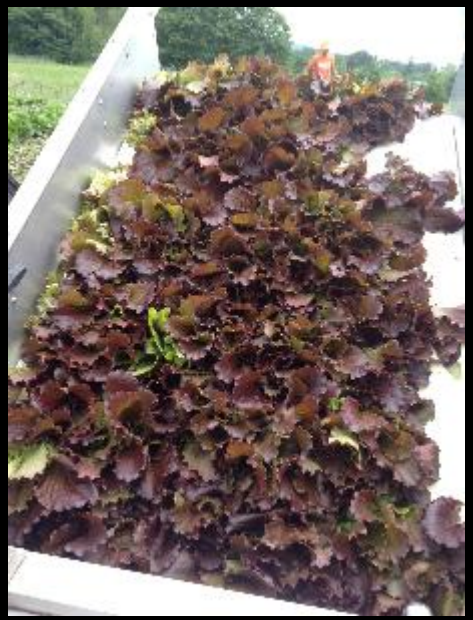
Access to larger markets is driven by lowering the cost of production

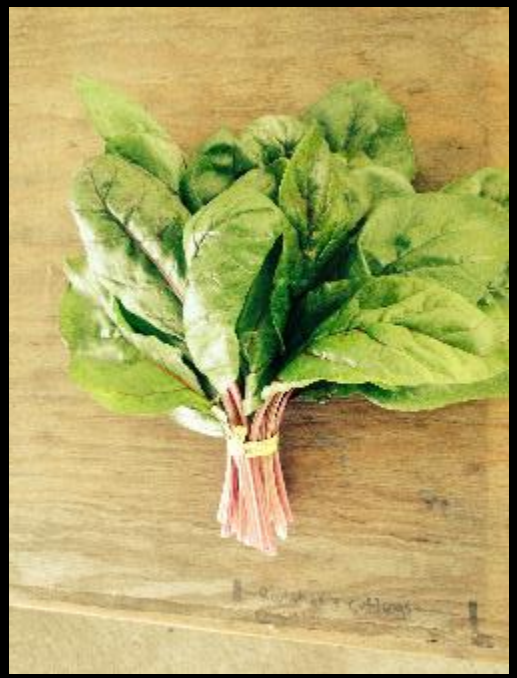
Providing Extended Season Education and Technology for Specialty Crop Growers

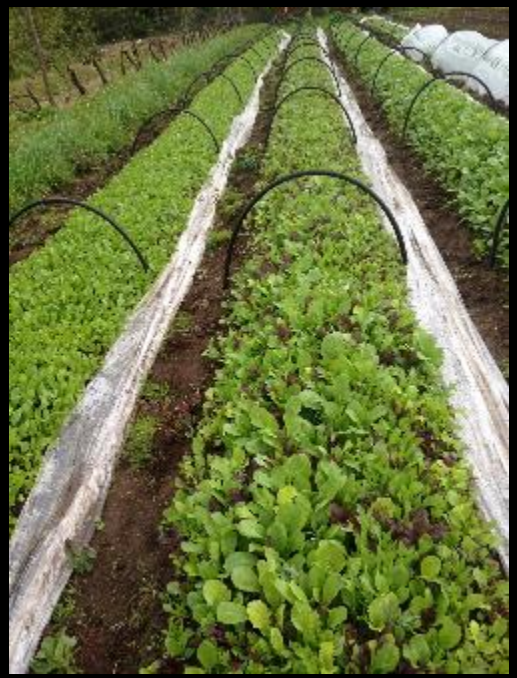
WSDA Specialty Crop Block Grant

Identify suitable varietals for mechanized harvest

- Chenopods
- Brassicas-Kale, Mustards, Asian Greens
- Lettuce

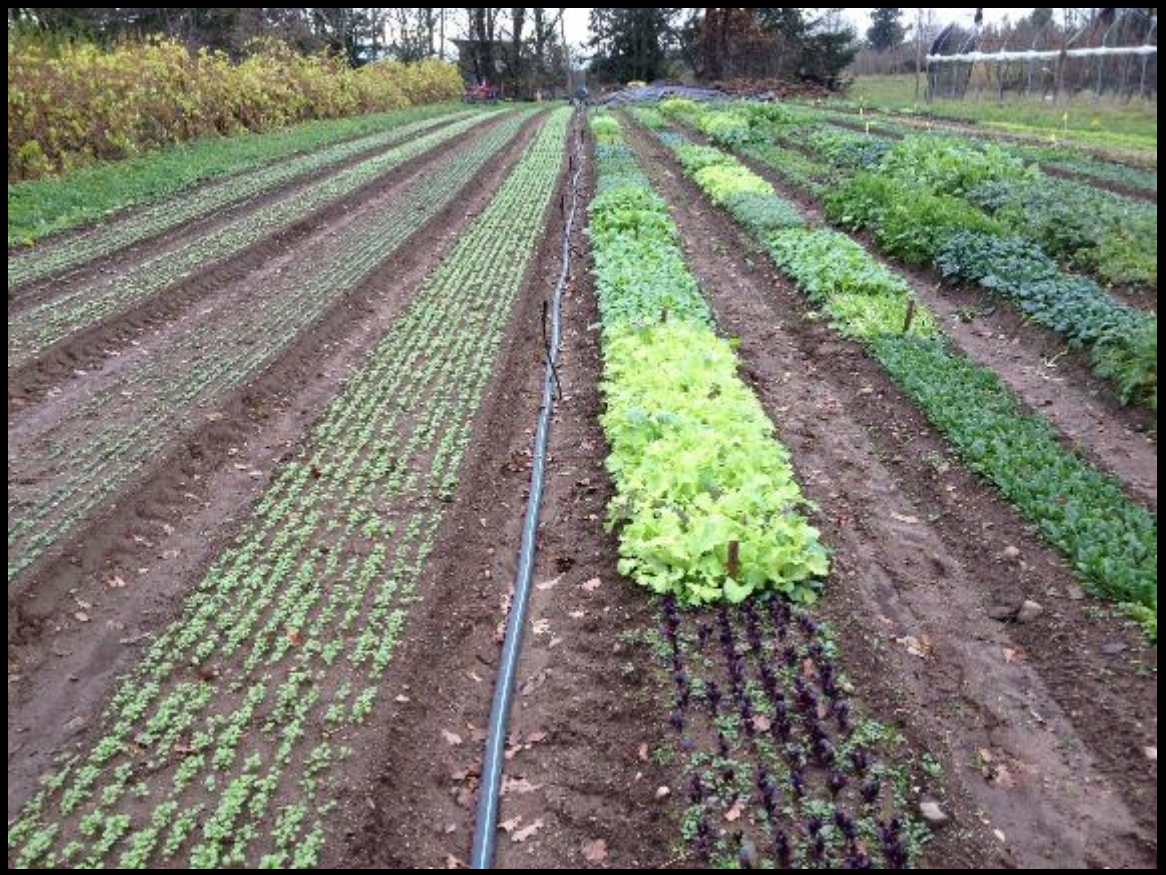






Variety Selection Considerations

- Growth Rate
- Loft
- Color
- Texture
- Taste
- Shape



Building an Adaptable System for Open Field Production

- Change in management strategies
- Pre-plant soil management
- Direct seeding
- Germination
- Weeding
- Harvest

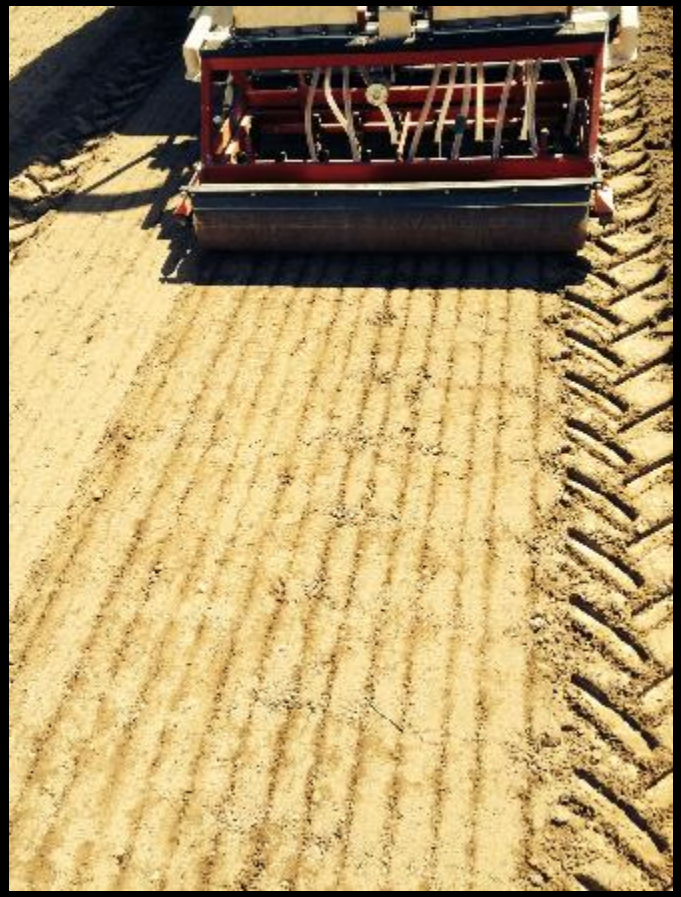
What we learned…

Pre-Plant Soil Preparation

- Cover crops
- Good weed management
  - stale seed bed
  - flamed beds
- Good fertility
  - rotation, compost, pH, available nutrients

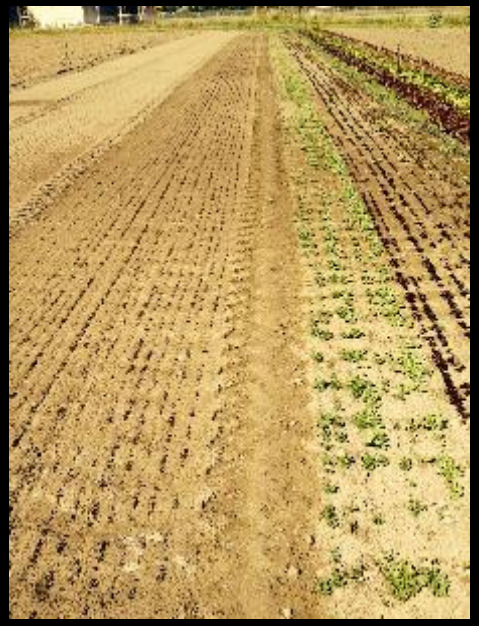
Direct Seeding

- High density drop seeder
- 80” bed with a 69” planting surface
- 32 rows per bed
- 2300 seeds per running foot
- Closed canopy crop by 2.5 – 3 weeks
- Use varieties with same vigor



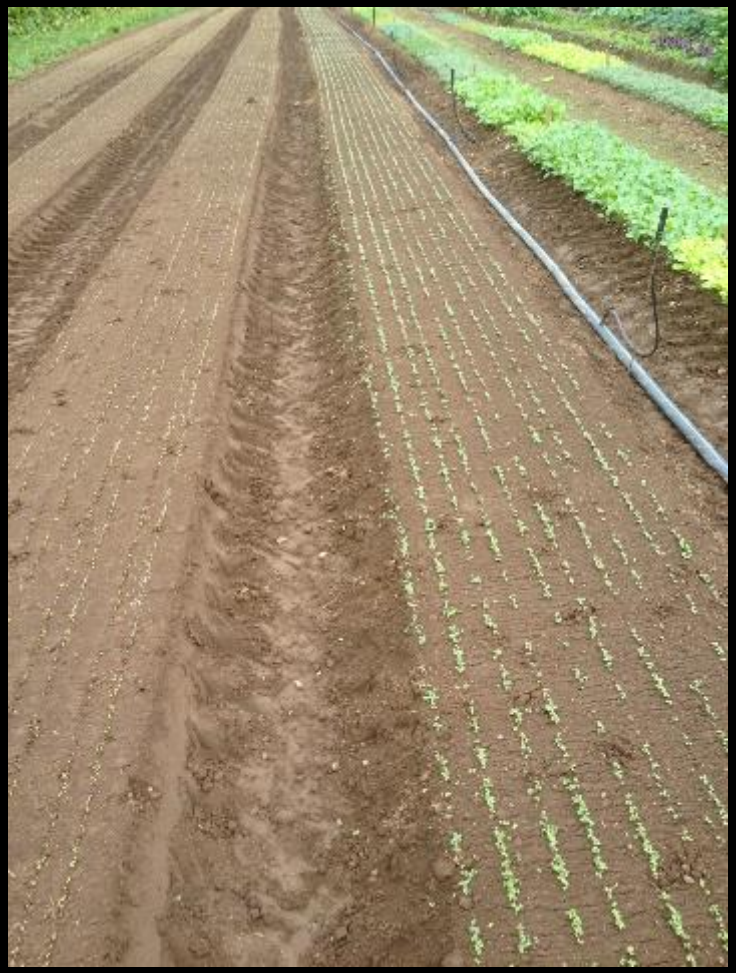
Germination

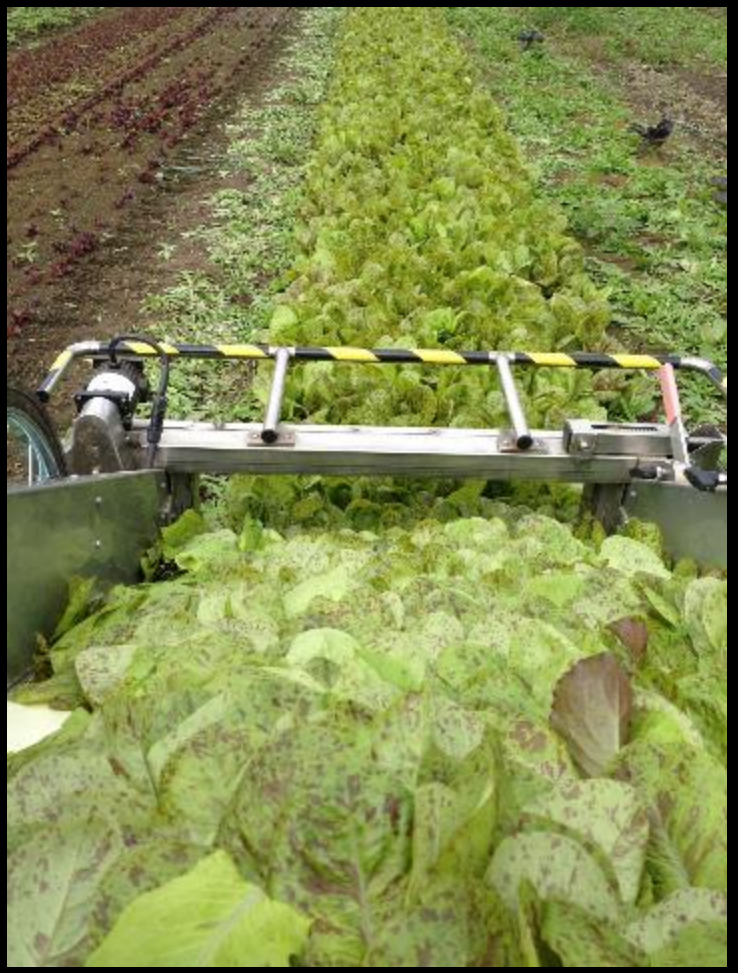
- Timed irrigation – critical
- Good fertility critical for first growth streak
- Even surface moisture leads to even stand



Weeding

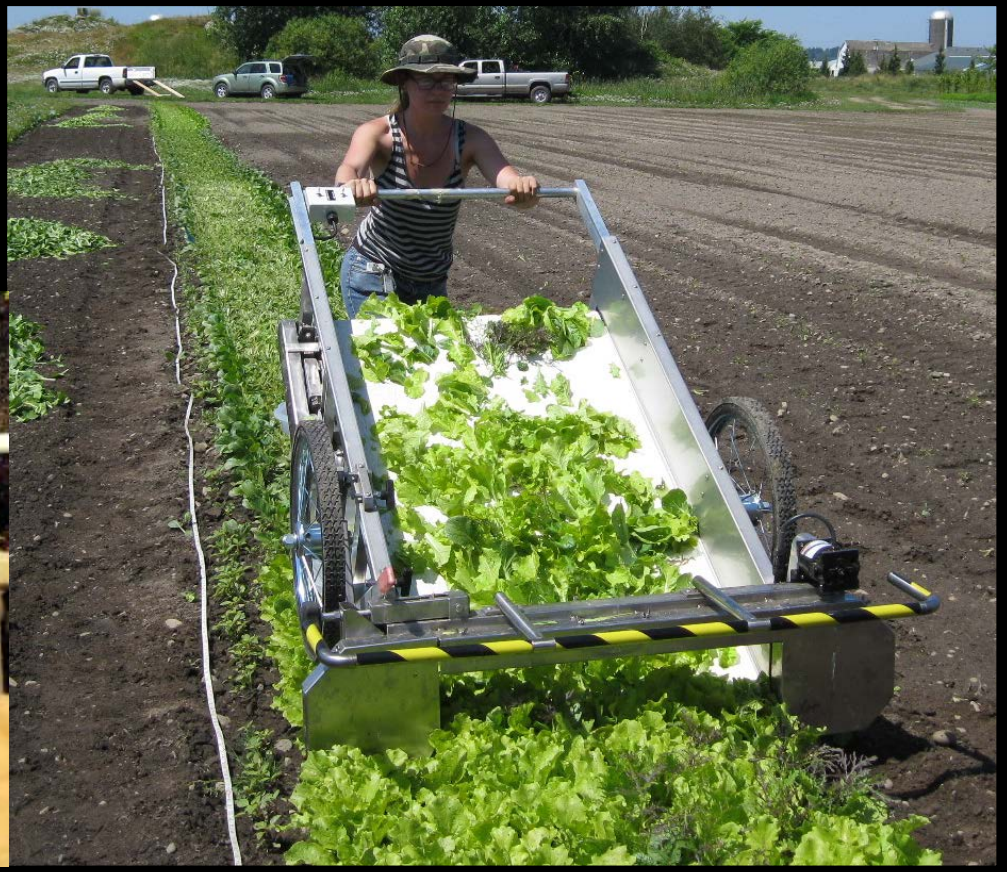
- Weeding at pre-harvest 1 time

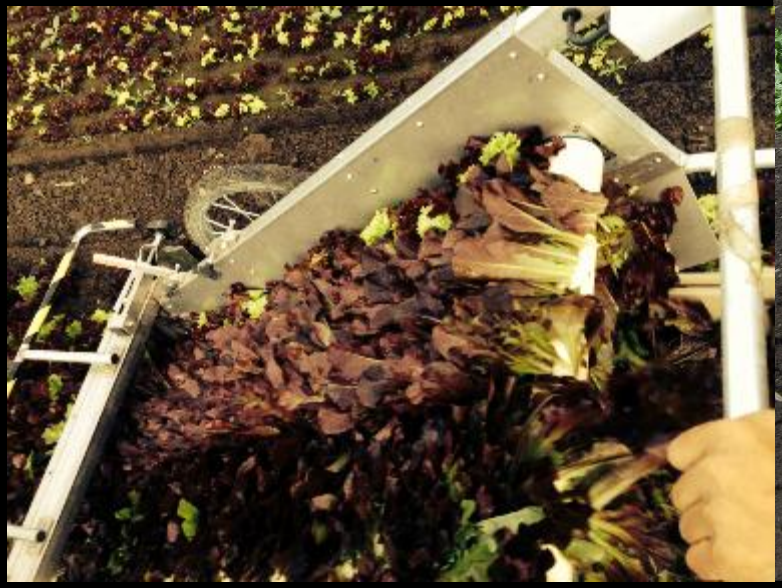




Harvesting Equipment

- Electric, walk-behind
- Ban saw blade with conveyor belt





Harvest

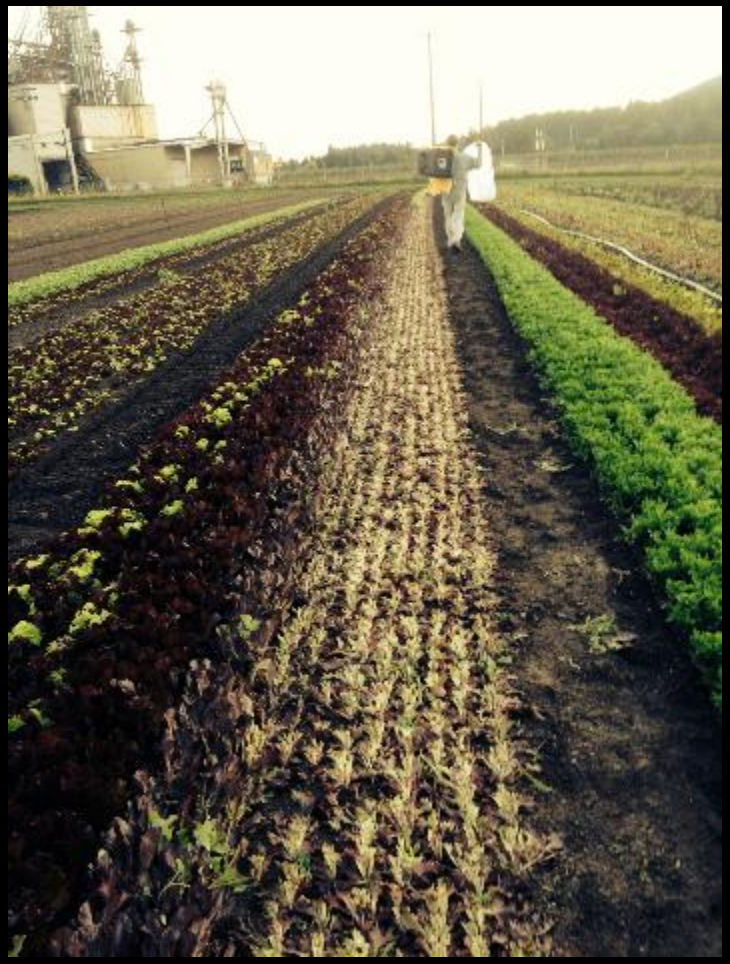
- Growth in final week contributes close to 50% of total weight at harvest.
- Weeding complete
- Irrigation night before- yield increase of 20% and better shelf life
- 20% less cullage (wilt) in processing
- Machine harvest into 20 gallon totes

Harvest cont

- Spring Mix- seed to harvest 18-28 days
- Lettuce- seed to harvest 28-35 days
- Total labor per bed @$18.hr = $113.99
- Harvest of 180 lbs per bed – 1 person 1hr
- Multiple cuts per bed – 1 person hr. each cut
- 5-8 days between 1, 2, 3 harvest cuts
- 4th cut 10 days not consistent

Managing Crop Availability

- Manage beds for 5 - 7 day harvest intervals
- Over production: timed cutting and managed re-growth for timely harvest
- 1 person hr/labor per bed to cut and dump



Harvest and Food Safety Benefits

- No hands come in direct contact post- harvest
- Product is cut clean, no mud, soil or debris
- Product is harvested into sanitized totes
- No damage to greens from over handling
- Product is washed using OMRI sanitizing agent
- Product is spun, dried and bagged and boxed in clean environment

2014 Cost of Production

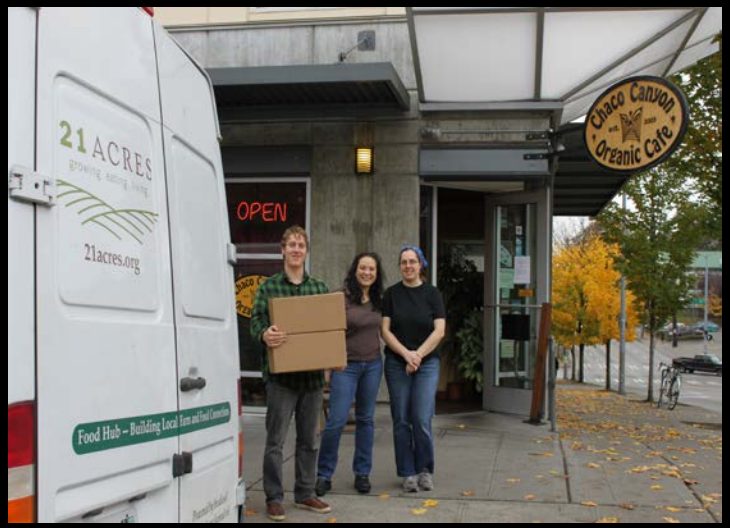
- Harvest
  - 1 cut only: $1.69/lb
  - 2 cuts: $ .85/lb
  - 3 cuts: $ .69/lb
- Processing and Washing
  - Well weeded pre-harvest $ .65/lb
  - Weedy greens post harvest $1.70/lb

Market Effects

- Trust in product comes from being able to outline food safety steps throughout your production
- More consistent delivered product
- Our storage trials in 2012 and 2013 demonstrated consistent 14 day shelf life of all categories of varieties
- Price competitive

Puget Sound Food Hub

- Seller eligibility requirements
- A marketing channel that didn't exist before
- Rules of Participation and Collaboration
- Food safety planning
- Value propositions
- Shared marketing and sales
- Farmer Advisory Committee



Collaborative Approach

- Famers working together
  - Equipment share = spread financial risks
  - Coordinate harvests = complement vs. compete
  - Share ideas = move innovation forward

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Q & A