Part 2: Winter Production with Passive Solar


WEST SIDE


BRACE
END

Operation:

- open on warm days to encourage ventilation, and control diseases (powdery and downy mildew)
- night: Coleman: two layer, plus third layer over sensitive crops on nights below upper 20s (most sensitive: cilantro, dill, lettuce; next: spinach and parsley; next: beets, carrots, small leaf tatsoi; most cold tolerant: collards, kale, large leaf tatsoi, mache, scallions)
- pick greens mid to late afternoon to avoid nitrate buildup, which occurs overnight and dissipates during day

Pests:

- voles & meadow mice (sonic repellers, traps, cats)
- slugs (hand pick, drop in salt or 10% ammonia solution; spray w. 10% ammonia solution)
- aphids (rub out; prune seriously infested leaves/dispose)

Greenhouse Materials List, Costs, Sources, 2000

For a 10' x 25' greenhouse covering a 5 x20' bed with 2.5' wide paths on sides and ends

Element	Materials	Cost	Source
Base:	8-2x4x10'	$16.00	YBC, Lowes
	1-1x4x8' for lapping base boards	2.28	"
	hardware: 4 corner brackets, bolts, wood screws	8.00	Houts
	rebar to hold base to ground: 4-2' pieces	2.00	Lowe's
Frame:	29-10' lengths of 1/2" indoor electrical metal tubing (emt); actual OD=11/16"	41.00	Lowe's
	4' wood dowel to connect conduit, replaced years later with emt connectors	1.60	Houts
	hardware: 56-8x1.25" pan head sheet metal screws, galvanized, Phillips, to connect pipe; 44-8x3/4" pan head sheet metal screws, galvanized, Phillips, to connect purlins; 1# box 6x1-5/8 drywall screws, Phillips to connect pipe arches, braces to frame	25.00	Houts
Door:	two-2x2x8' (avoid ripping 2x4s)	8.00	YBC, Lowe's
Covers:	100' roll of 10' wide 6 mil Tufflite IV, UV resistant plastic (ship UPS ground).	67.00 14.00	Farm Tek
	80 1/2" clips to hold plastic to frame:	73.00	Territorial Seed
	50' UV poly rope to hold down plastic		Lowes
	68' of 1x2" boards to hold plastic down on base frame (rip 1x4 boards)	11.40	YBC, Lowe's
	110-6x1-5/8 drywall screws, as above	above	Houts
	Row cover: Pro-17 Row Cover, 10x50'. Reemay will also work.	19.50	Fedco
	70-80' #9 gauge wire hoops to support row cover. 10' per hoop	7.00	O.W. Houts
	clothes pins to hold row cover onto wire (3/hoop)	2.50	Lowe's
Tools A:	1/2" pipe bender for conduit	18.00	Lowe's
Tools B:	drill, wood bits, good metal bits; wood saw, hacksaw; screwdrivers, wrenches, pencil, tape measure, clamps, good workbench, metal and wood punches, hammer, sledge hammer, protractor		On hand
	Total Cost (2000 prices):	$316.28	

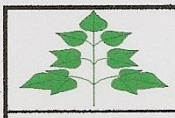
Greenhouse Temperature Performance Data

We measured the temperature performance with a battery-operated digital min-max thermometer with "inside" and "outside" probes to measure temperatures under the row cover and inside the greenhouse (outside the row cover). We used a mercury min-max thermometer to measure ambient temperatures outside the greenhouse (in the shade of the north side of the greenhouse).

We collected data from November through March under a variety of conditions -- really cold days (and nights), sunny and cloudy days. We collected temperature data at various times during the day, but the summary below is limited to minimum and maximum temperatures. Minimum temperatures correspond generally to nighttime conditions and maximum temperatures to daytime conditions.

The table below shows the range of monthly average increases in temperature due to each of the two envelopes -- the outer skin and the row cover -- for maximum and minimum temperatures.

Temperature Performance of Winter Greenhouse

	**Range average T increase across outer skin**	**Range average T increase across row cover**	**Range average total increase**
Nighttime Increases	**3.7 - 5.8 deg F**	**2.9 - 3.8 deg F**	**7.0 - 9.6 deg F**
Daytime Increases	**6.2 - 12.0 deg F**	**2.3 - 10.0 deg F**	**11.5 - 19.2 deg F**

Worst condition: 0 deg outside, 6.8 deg inside, 11.2 deg under row cover

Crop Chart, 2012 Growing Season at Neo-Terra

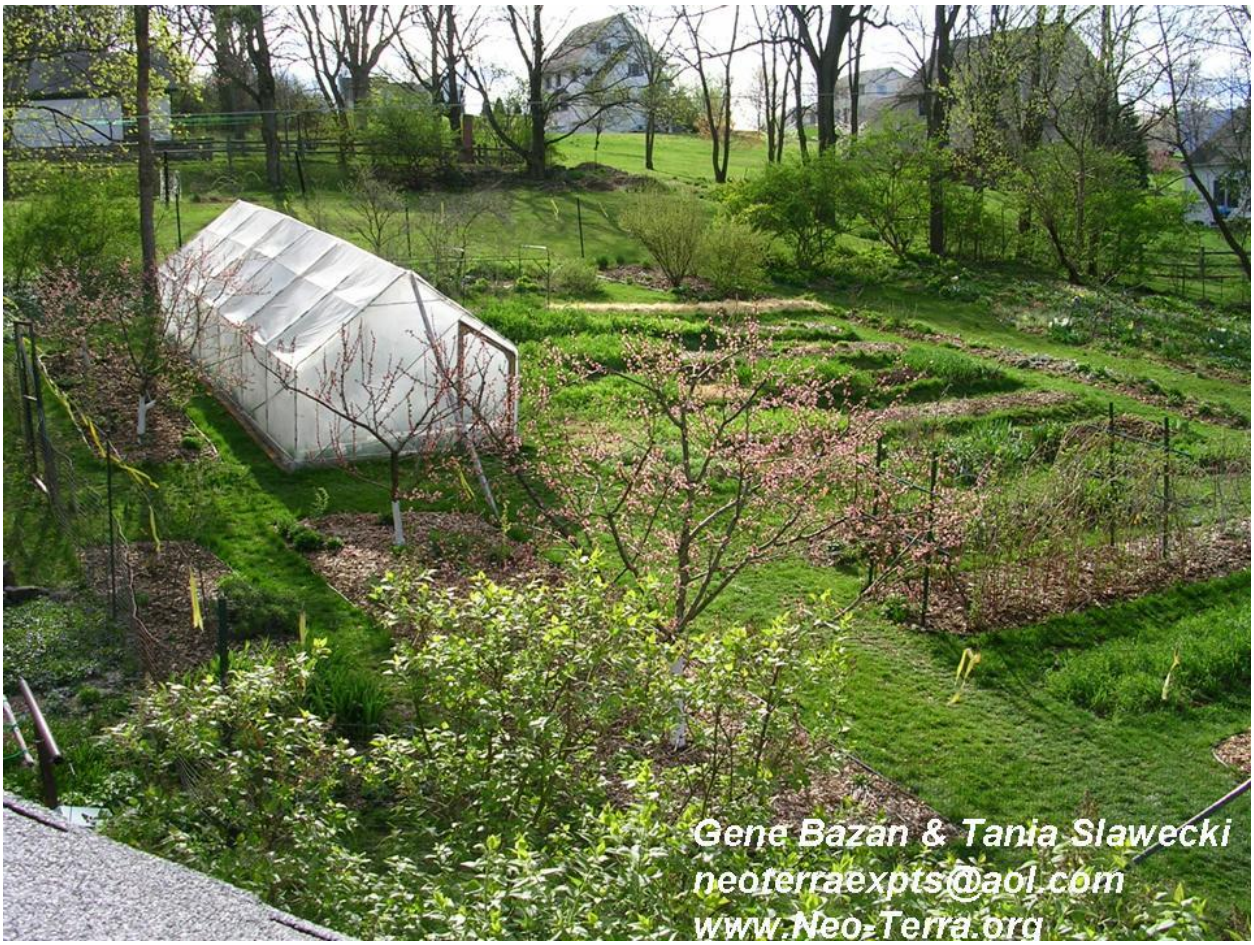
file=c:Garden/12CROPS

WINTER CROPS 12: BED 8	Source	D=	sow dat targ/act	# flats	time in flat	date transpl: targ/act	date 1st yield	sq ft plant ed
Cover Crops: Barley, vetch	F8101, F8231		5-4/	broad-cast			cut, skim 7-24/	115
Bng onions	above	65/	7-24/	0.75f	6-8	8-24/		12
Bts:Det. Red	Above	48/	7-24/	7r	3-4	8-14/		5
Ct: Danvers	Above	75/	7-24/	0.5f	3-4	8-20/		10
Parsley [1] 5"	above	70/	8-1/	6r	7-8	9-1/	12-1/	7.5
cilantro (5")	ours		8-1/	0.75f	3-4	8-26/	10-15/	12
Dill (5")	Ours		8-1/	8r	4-5	8-26/	10-15/	6
Lettuce: 8" [2]	Ours	65	8-7/	5r	3-4	9-1/	9-24/	15
Spinach [3]	Ours	43	8-14/	6r	3-4	9-7/	10-21/	10
tatsoi (8")	F3245TO	45/	8-14/	1.5r	3-4	9-4/	10-1/	2.5
Hardy tatsoi (6")	F3198SO	45/	8-14/	1 r	3-4	9-2/	10-1/	5.0
Kale (2 red, 3 white) 15"	Above	59/	8-14/	1r	3-4	9-8/	12-5/	10
arugula	F3193AO	45/	8-14	1r	3-4	9-5/	10-1/	w lettuce
mache (5") [4]	F3102VC	45/	8-21/	0.5f	5	9-26/	11-1/	12+40
			9-5/	0.5f	8-9	11-23/	2-21/	
Green ice	F2713GO	45	9-2/	4r	3-4	9-28/	10-14/	10
							Total	115
							Avail	115
Garlic [5]	Ours	*17-26*	10-1/	ds			7-5/	15

[1] Soak and rinse three times
[2] Chill; split between lettuce, mesclun.
[3] Soak spinach prior to planting
[4] Mache: only 60% germination rate; plant enough to replace lettuce, dill, cilantro (after thanksgiving).
[5] Planted 162 cloves in 15 sq.ft., down from 183 cloves this past year and 165 the previous year, when they were small! Tip: In Warmer Climates Store Your Hardneck Garlic in a Cool Spot Before Planting. Hardneck garlics need to go through a cold period to trigger sprouting. If your soil temperatures stay warm, store the garlic in a cool, dry place, 7 - 10°C (45 - 50°F), for about three weeks before planting. Plant hardneck cloves at least two inches below the surface.

Winter Bed Layout 2012-13

5x23' bed (115 sq.ft.)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