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Final Report to CPAC for funded project: Low Water Use Rotational Crop Options for San Luis Valley Potato Cropping Systems - Crop Year 2013

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Colorado State University
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Summary

Nineteen crops with potential for use in San Luis Valley potato rotations were evaluated during the summer cropping season of 2013. The green manure crops evaluated were grown under limited irrigation to determine which of these crops would yield highest aboveground biomass, compete most aggressively against weeds, and contribute most to the fertility status of the field in preparation for the potato crop to follow. Top performers by category: Fastest Rate of Growth = Caliente 61 Indian Mustard, Monida Forage Oats, Yellow Sweet Clover TH Line, Mancan Buckwheat; Yield and Water Use Efficiency = Winfred Kale-Turnip hybrid, Elbon Cereal Rye, TiffLeaf3 Pearl Millet; Aggressive Competition Against Broadleaf Summer Annual Weeds = Winfred hybrid, Elbon, Caliente 61 and TiffLeaf3; Fertility Nutrient Cycling as Green Manure = Terra Nova Radish, Soil Saver Black Oats, Yellow Sweet Clover TH Line, TiffLeaf3. The evaluations of aboveground biomass, growth, and soil fertility do not take into account potential negative impacts on soilborne pests (e.g. host status of Columbia Root Knot Nematode) due to the growth of specific crops and cultivars, as this was outside of the scope of the CPAC project funded. Selection of cultivars for farmer's use either singly, or in combination with other species and varieties, can be informed in part by data related herein, along with information available from local pest control specialists familiar with these crops' capacities and limitations.

2013 Study Findings

Cultivars and crop types field trialed in the San Luis Valley during Summer 2013 are listed in Table 1. The cultivars and crop types chosen for trialing possessed potential for being highly

Table 1. Crops field trialed for potential rotational options with potatoes, seeded 24 June 2013.

2013 Small Plot Trial Entries				
Type	***Crop***	***Cultivar***	***Lbs Seed/Acre***	***Seed Cost/Acre***
Brassica	*Arugula*	*Trio*	8	$32
Brassica	*Ethiopian Cabbage*	*Corrine*	3	$12
Brassica	*Fodder Radish*	*Anaconda*	8	$32
Brassica	*Fodder Radish*	*BioFum*	15	$60
Brassica	*Fodder Radish*	*Cassius*	8	$32
Brassica	*Fodder Radish*	*Defender*	20	$65
Brassica	*Fodder Radish*	*Doublet*	8	$32
Brassica	*Fodder Radish*	*Terra Nova*	8	$32
Brassica	*Indian Mustard*	*Caliente 61*	6	$30
Brassica	*Winfred*	*Winfred*	6	$21
Cool Season	*Black Oats*	*Soil Saver*	100	$34
Cool Season	*Cereal Rye*	*Elbon*	100	$25
Cool Season	*Forage Oat*	*Monida*	100	$34
Legume	*Fava Bean*	*Snowbird*	40	$28
Legume	*Yellow Sweet Clover*	*YBSC-TH Line*	10	$30
Warm Season	*Buckwheat*	*Mancan*	40	$30
Warm Season	*Polyculture - Sordan 79*	*Poly Sord 79*	39	$35
Warm Season	*Polyculture - Terra Nova*	*Poly Terra Nova*	20	$35
Warm Season	*Pearl Millet*	*TiffLeaf3*	20	$25

Cover Crop Mixes - Blends Formulated For $35/acre Target Cost				
Polyculture - Sordan 79	**Cultivars Blended Together:**	**Lbs Seed/ac**	**Total = 39 lbs/ac**	**= $35/ac**
Yellow Sweet Clover	YBSC GCS VNS	2		
Sorgum Sudan	Sordan 79	15		
Black Oats	Soil Saver	20		
Ethiopian Cabbage	Corrine	0.8		
Buckwheat	GCS VNS	1		
Polyculture - Terra Nova	**Cultivars Blended Together:**	**Lbs Seed/ac**	**Total = 20 lbs/ac**	**= $35/ac**
Yellow Sweet Clover	YBSC GCS VNS	1		
Black Oats	Soil Saver	9		
Radish	TerraNova	7		
Ethiopian Cabbage	Corrine	0.8		
Buckwheat	GCS VNS	1.2		
Sainfoin	Shoshone	1		

water use efficient, rapid growing, competitive with weeds, readily available for seed sourcing and/or drought tolerant. Seeding rates used were high to assure maximum competitive capacity of the cover crop against weeds. Single species plantings and multi-species plantings were trialed to evaluate potential synergistic effects of increasing diversity, and to distinguish especially strong candidates for inclusion in future cover crop seed blends. Seed costs were generally capped at $35/acre, with the exception of two of the brassica entries, namely BioFum and Defender, which were seeded at rates normally used where some biofumigant response is anticipated upon crop termination and incorporation. Seeding occurred on 24 June 2013, using an experimental-scale small-plot drill from Colorado State University's San Luis Valley Research Station. Plots were established within a field to be seeded to cover crops, and the area designated to the plot study had been in a mix of brassica and warm season grass cover crops during the 2012 season, as well. Plots were 20 feet long x 6 feet wide, with each CPAC-funded entry seeded in 5 replicate blocks across the plot area. No fertilizer was added to the plots prior to or during the trial.

Soil sampling of each plot area to be seeded occurred prior to crop establishment, to serve as a fertility baseline. Record of irrigation timings and quantities were maintained by the farm hosting the experiment. Measurements of crop canopy development (i.e. percent cover), incremental crop height as specific target dates through the trial period, and of the competitive capacity of the crops trialed at withstanding or overcoming weed competition. In comparison to recent years, 2013 proved an incredibly favorable year for development of the summer annual weeds Redroot Pigweed and Common Lambsquarters in the trial field, and throughout the San Luis Valley. Weed competition became a primary focus of this study due to the incredible onslaught of germinated weed seedings in plots. Water inputs utilized, accounting for both irrigation and effective precipitation, are listed in Table 2. In general, the experimental area was managed to allow for some water stress to occur between irrigations. With the arrival of the July/August monsoon season, irrigation inputs were effectively ended prior to the chopping and incorporation of residues. The 2013 summer growing season was generally mild, as indicated by the limited accumulation of growing degree days for the warm-season (base temperature 50 degrees F) plants trialed such as buckwheat, pearl millet and sorghum-sudangrass relative to the higher level of heat units accumulated by the cool-season (base temperature 40 degrees F) crops such as cereal rye, forage oats, the brassica cultivars, and the legumes trialed during the 50-day period from planting to crop destruction as a vegetative green manure.

Two primary factors drove the timing of crop destruction in the 2013 growing season. Because the plot study contained many different species of plants, and because numerous plots intentionally were seeded with both cultivated grasses and broadleaves for use as a green manure crop, the trial area was not treated with herbicides during 2013. Pigweed and lambsquarters did emerge in large number. To avoid depositing additional weed seeds into the field's seedbank, care was taken to monitor the progress of the weedy species, and to affect weed control prior to weed seed maturation and dispersal. General observations from this 2013 study indicate Pigweed to be one of our quickest weeds to set seed, and that in 2013 it took roughly 50 days after early-summer planting for the pigweed seeds to reach the milk stage. Careful monitoring of cover crop/green manure/forage fields will be necessary to assure the crop seeded can be terminated in a timely fashion (e.g. 45-55 days after planting), to limit the risk of increasing weed competition indefinitely into the future. The second major factor in deciding when to terminate the cover crop and incorporate it as a green manure was the availability of irrigation water. The field on which the trial was conducted had been managed to receive approximately 5.9" of irrigation water, and had received an additional 1.74" as rain, falling primarily during the late establishment through early vegetative growth stages of the plots. Having met budget desired, and keeping in mind the weed seed concern, the plots were terminated following 50 days-days-after planting. Along those same lines, please note that buckwheat flowers indeterminately, starting at roughly 10 days after planting, and setting its first mature seeds at right around 45 days after planting, so assuring that this species is planted in fields or in mixtures that will be terminated early is important, unless having volunteer buckwheat in future crops is of only minor concern for your farming operation.

Table 2. Amount of Water Supplied to Trial Area During the Experimental Period.

2013 Water Totals

Inches Irrigation + Effective Precipitation

1.50	**Preplant Irrigation**	**Running Total**	**GDD base 50 F**	**GDD Base 40 F**	**DAP**
0.25	**Seeded 24-Jun**	1.75	0	0	0
0.55	26-Jun	2.30	43	73	2
0.55	01-Jul	2.85	122	202	7
0.50	*02-Jul*	3.35	134	224	8
0.60	06-Jul	3.95	191	321	12
--	09-Jul	3.95	248	408	15
0.50	14-Jul	4.45	333	543	20
--	16-Jul	4.45	357	587	22
0.65	22-Jul	5.10	457	747	28
--	23-Jul	5.10	476	776	29
0.65	28-Jul	5.75	551	901	34
0.25	*30-Jul*	6.00	574	944	36
0.65	03-Aug	6.65	636	1046	40
0.15	*05-Aug*	6.80	668	1098	42
0.07	*06-Aug*	6.87	681	1121	43
0.10	*08-Aug*	6.97	701	1161	45
0.05	*09-Aug*	7.02	708	1178	46
0.62	*11-Aug*	7.64	727	1217	48
--	13-Aug-14		**747**	**1257**	**50**
Total for Cover Crop Season		**7.64**	**GDD base 50 F**	**GDD Base 40 F**	**DAP**
(9 irrigation events + 7 rain events)					

Figures 1, 2, 3 and 4 relate the growth rates measured by crop type and by cultivar, along with accounting for the growing degree days and calendar days after planting on the same graphs.

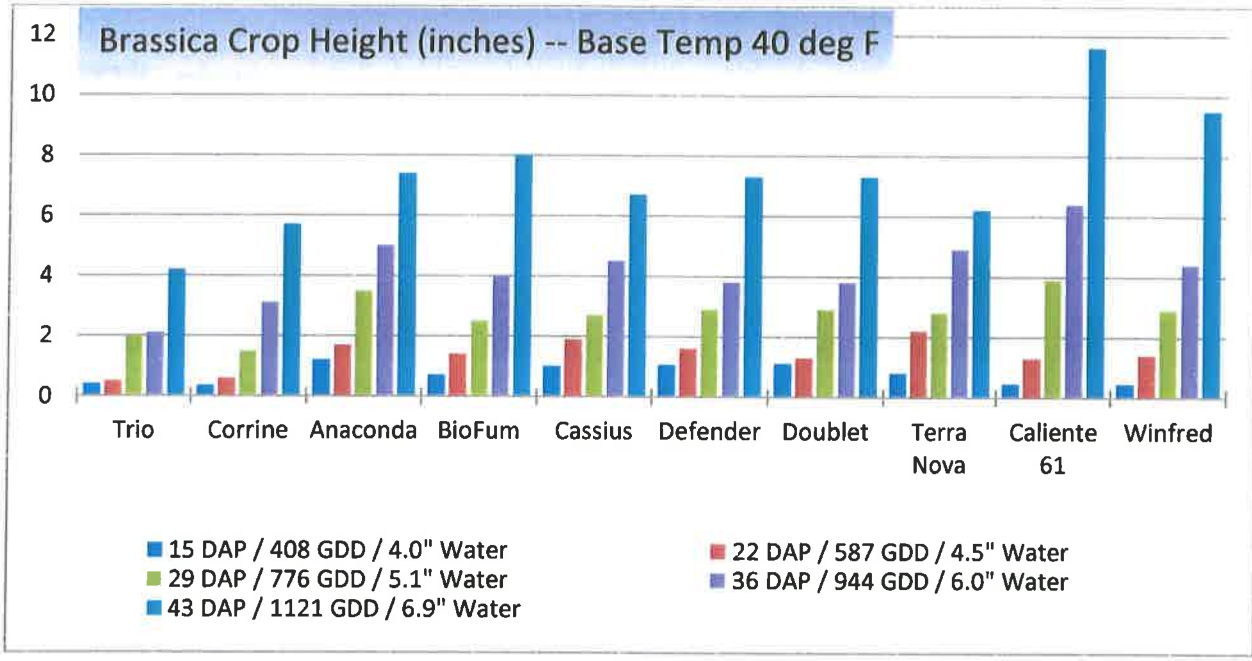

Figure 1. Rate of Brassica cover crop growth (measured as plant height) relative to growing-degree-day, time and water inputs to a fertile soil system.

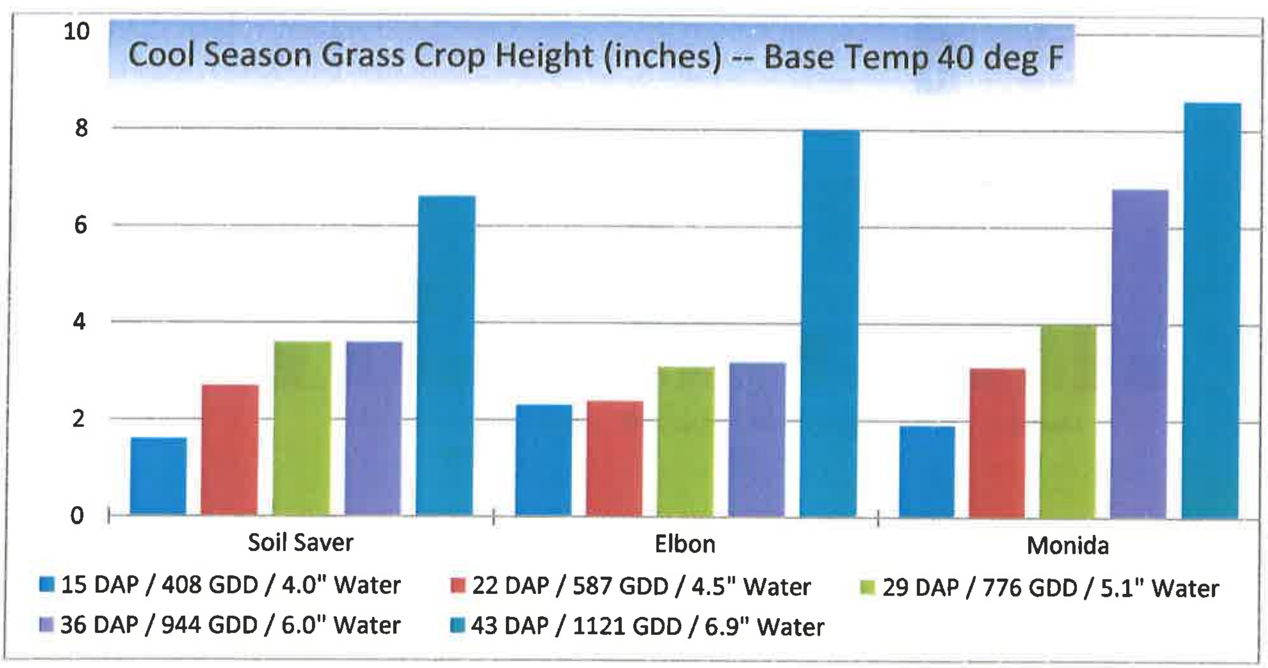

Figure 2. Rate of Cool Season Grass cover crop growth (measured as plant height) relative to growing-degree-day, time and water inputs to a fertile soil system.

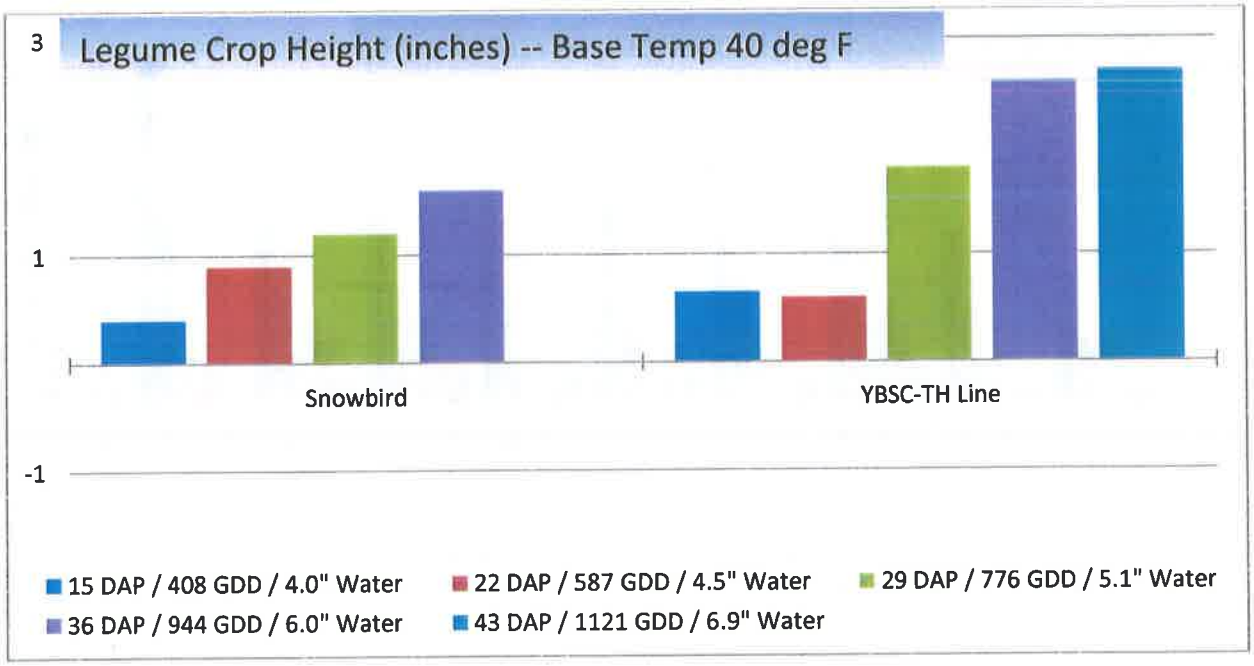

Figure 3. Rate of Legume species cover crop growth (measured as plant height) relative to growing-degree-day, time and water inputs to a fertile soil system.

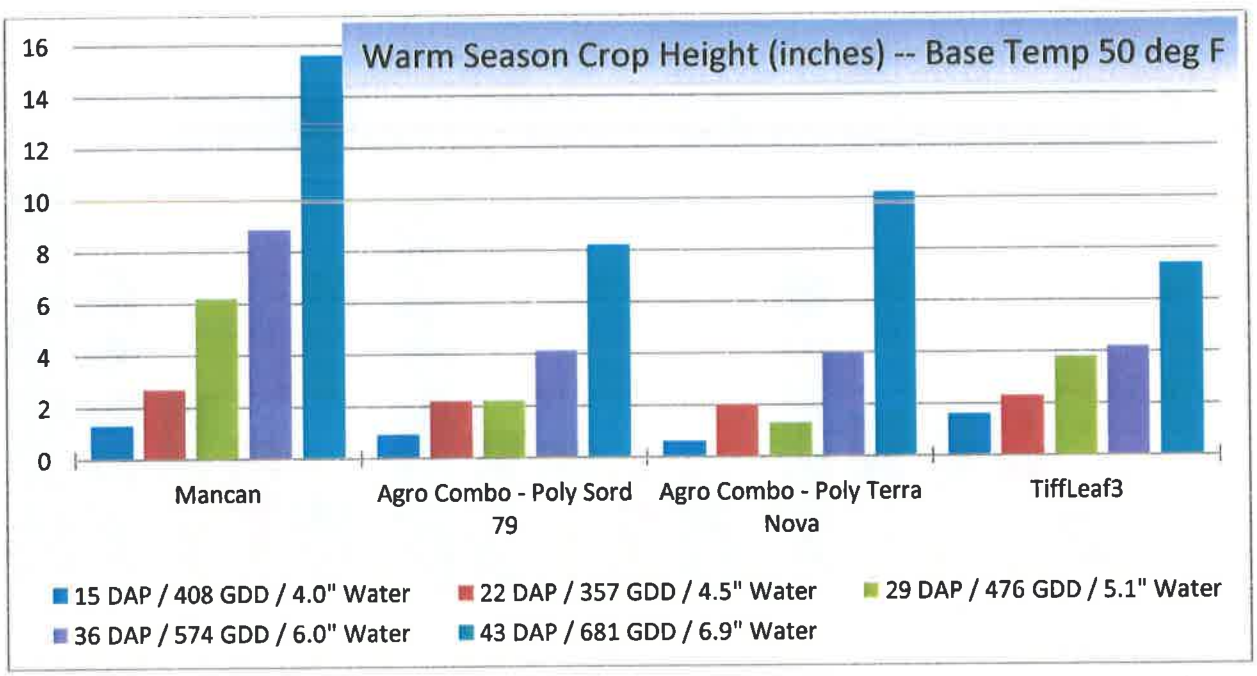

Figure 4. Rate of Warm Season crop growth (measured as plant height) relative to growing-degree-day, time and water inputs to a fertile soil system.

Where faced with extreme water limitations, farmers should look to those cultivars and crop types which have capacity to produce height (which can be correlated with biomass) quickly within the first 35-45 days after planting (DAP), as this is the period when rapid vegetative growth is beginning on the earliest of crops & cultivars in the categories of brassicas, cool season grasses, and most notably within this time frame for mid-June planted warm season mixes, for buckwheat, and for the warm season grasses. Timing seeding to optimize the crop's potential to capture monsoon moisture, assuming the monsoons will occur at the end of July, would allow an initial 5.0 inch irrigation investment to stretch into the equivalent of a 6.5 "-7.5" benefit from, with the yield potential increasing with each additional rain event to arrive. Delaying seeding until June 20th may be a useful practice to help forgo several irrigation events during the cover crop cycle. Further, be sure to drill cover crops and place seed at a depth that they will remain moist -- shallow seeding of cover crops is likely not a good use of a limited water resource, and even small seeded species like mustards and radishes are capable of emerging from ¾" depth where the soil is moist and warm. Use of infrequent but substantial irrigations (e.g. 0.60") during the early establishment phase will allow for greater application efficiency than attempting to maintain a very moist seedbed for the 3-7 days needed to get the crop(s) emerged during normal summer growing conditions.

Of all 19 entries tested, the top 6 crops for competitiveness against weeds are shown on Figure 5. The Cassius radish, Caliente 61 Indian mustard, Winfred kale x turnip hybrid, Elbon cereal rye, TiffLeaf3 pearl millet, and the blend labeled AgroCombo-Sordan 79 all showed good capacity to establish in spite of weeds (blue bars on the graph show the % of the 5 replicate plots of each cultivar which rated as growing well despite the weeds), and an ability to crowd out weeds instead of being overwhelmed by the pests (red bars on the graphs show the % of the 5 replicate plots were dominated by the crop instead of by the weeds).

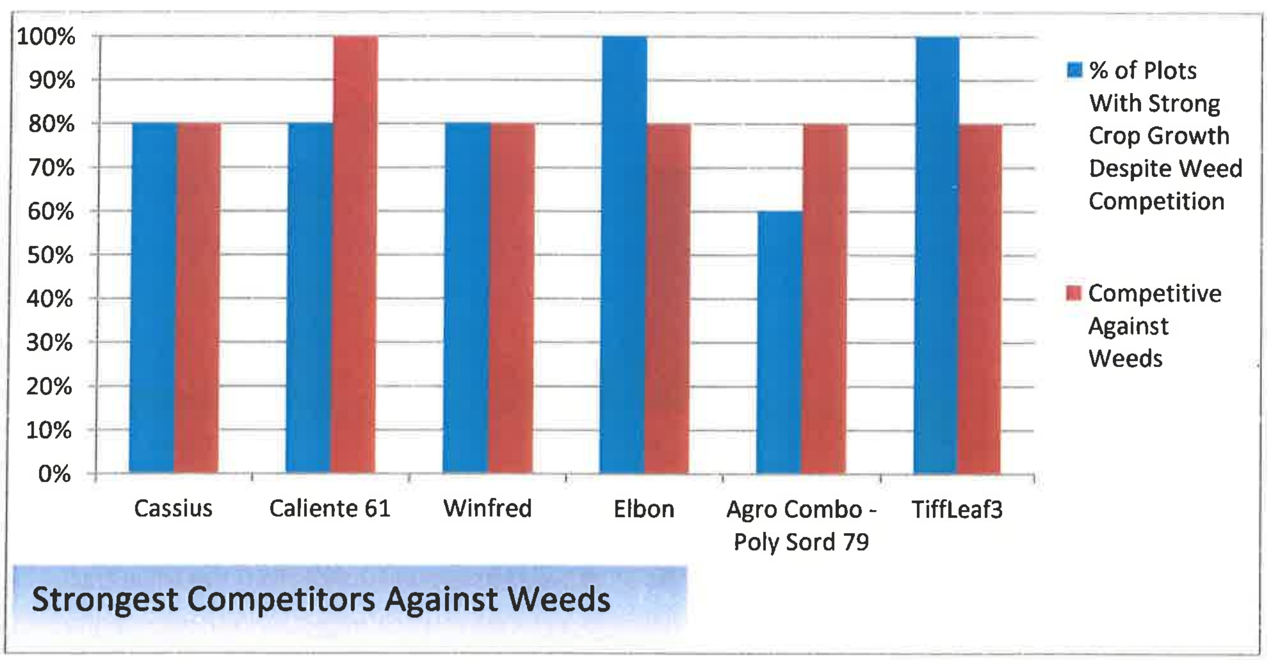

Figure 5. Weed Competitiveness Rating by Cultivar - Summer 2013.

Total aboveground biomass produced by the end of the trial period, following the monsoon rains, is shown in Figures 6-9. Again, 2013 proved to be an especially weedy summer. The blue bars on these graphs show the total biomass produced, while the red bars note what portion of that production was made up by the seeded cover crop's vegetation, the difference between the bars being the mass of vegetation that was pigweed and lambsquarters in the case of this trial.

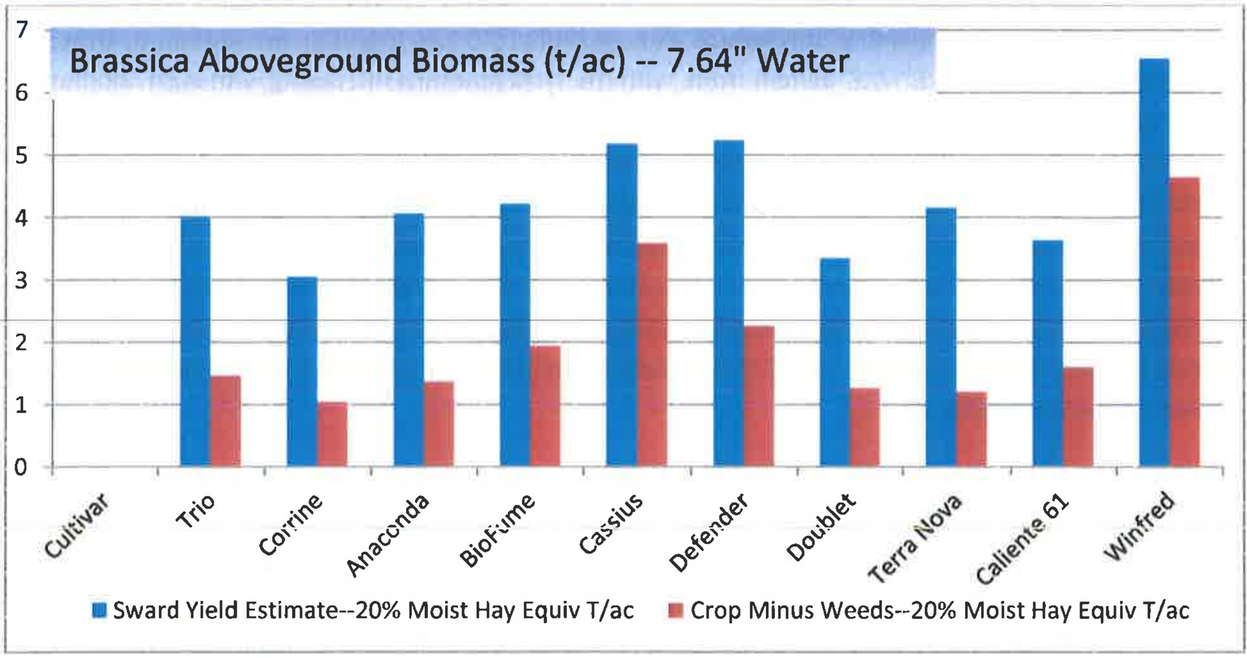

Figure 6. Brassica yield by trial end.

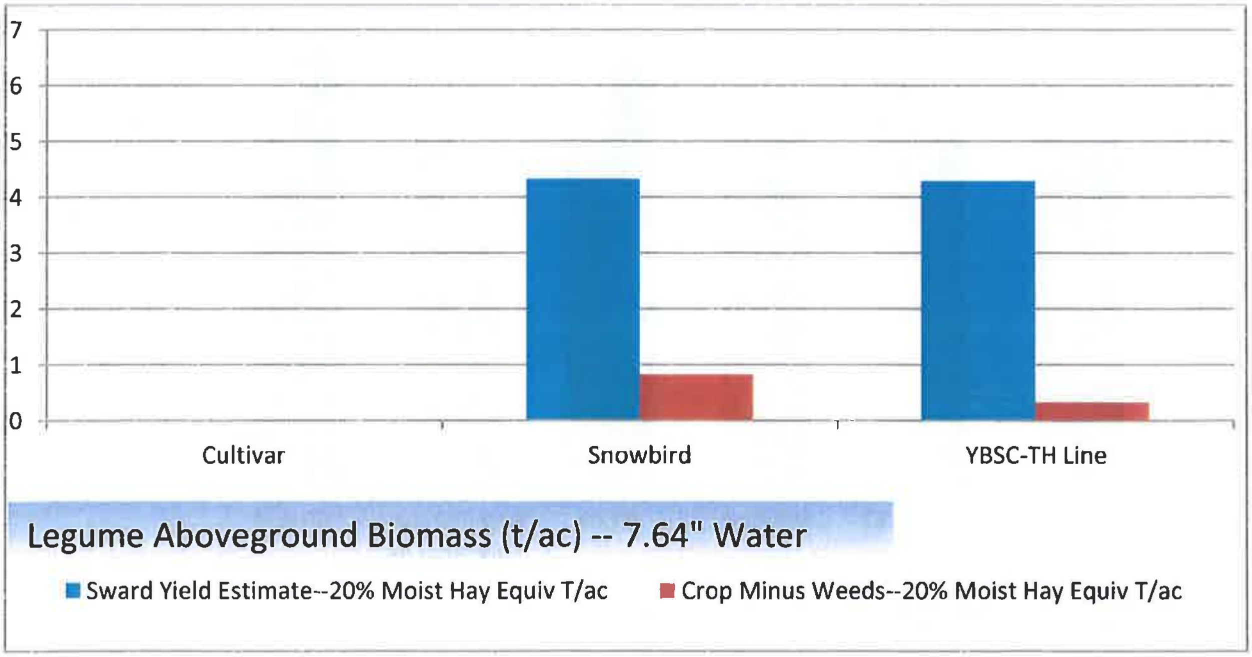

Figure 7. Legume yield by trial end.

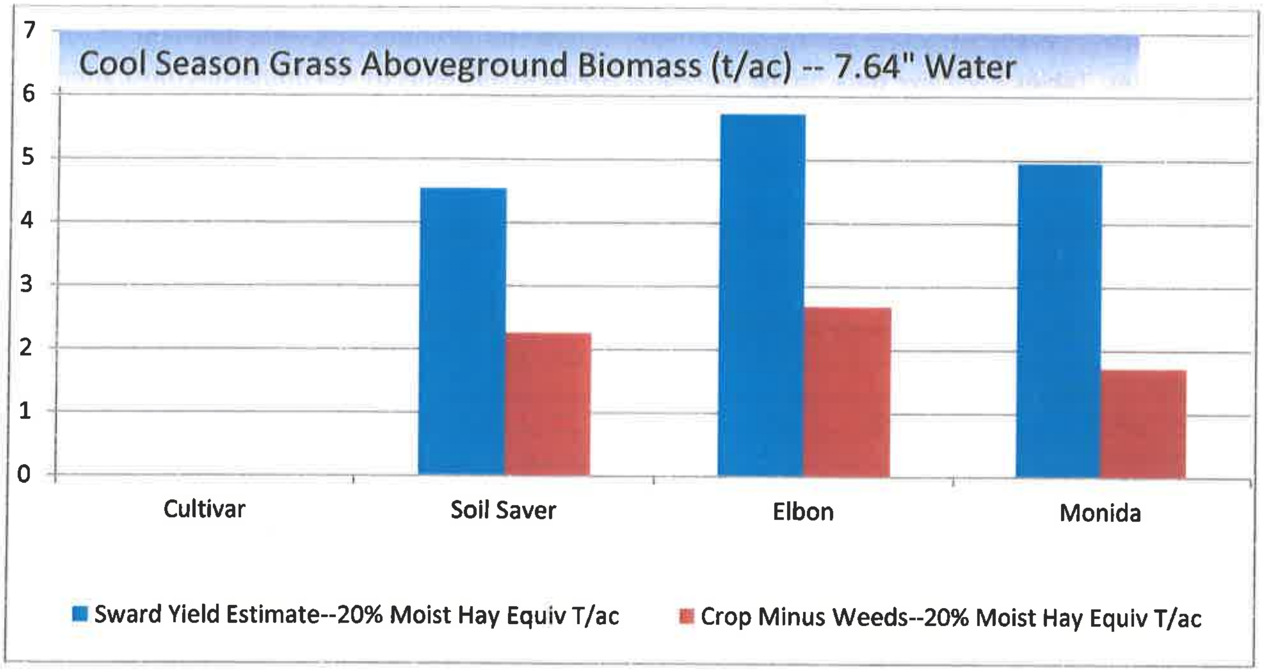

Figure 8. Cool season grass yield by trial end.

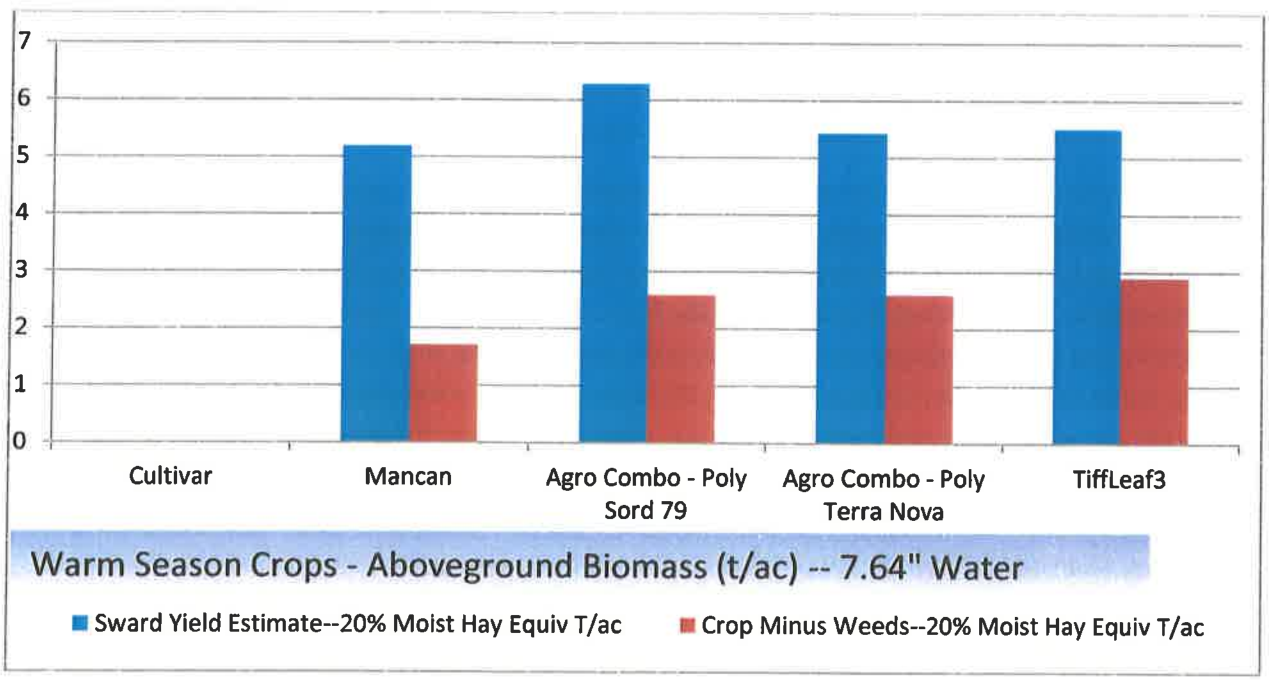

Figure 9. Warm Season Crop yield by trial end.

To address the issue of benefits or detriments that a particular green manure crop may have on a field in rotation with potatoes, specific to the fertility status of that field coming out of a green manure and cycling back to potato planting in spring, soil samples before and after the crop were taken for comparison. Tables 3 & 4 give data on the individual chemical nutrients or soil properties most affected by each green manure evaluated, being those factors that would subsequently affect the overall fertility budget for the potato crop to follow.

Table 3. Largest contributing positive and negative factors affecting soil fertility and associated costs following the incorporation of each green manure.

Crop	Cultivar	Green Manure Fertilizer Value		Largest (+) Factor	Largest (-) Factor
Arugula	Trio	$	(16)	Increased Ca	Decreased POXC
Ethiopian Cabbage	Corrine	$	107	Decreased Salts	Increased pH
Fodder Radish	Anaconda	$	125	Increased S	Decreased Inorganic-P
Fodder Radish	Biofum	$	9	Increased K	Decreased Free Lime
Fodder Radish	Cassius	$	(39)	Increased S	Decreased Inorganic-P
Fodder Radish	Defender	$	72	Increased POXC	Decreased Free Lime
Fodder Radish	Doublet	$	60	Increased K	Decreased Inorganic-P
Fodder Radish	Terra Nova	$	180	Increased S	Decreased Inorganic-P
Indian Mustard	Caliente 61	$	160	Increased S	Decreased Inorganic-P
Black Oats	Soil Saver	$	171	Increased K	Increased pH
Cereal Rye	Elbon	$	40	Increased POXC	Decreased Inorganic-P
Forage Oat	Monida	$	65	Increased POXC	Decreased Inorganic-P
Fava Bean	Snowbird	$	69	Increased K	Decreased Inorganic-P
Yellow Sweet Clover	YBSC - TH Line	$	83	Increased S	Decreased pH
Buckwheat	Mancan	$	145	Increased Ca	Decreased Inorganic-P
Polyculture-Sordan79	Poly Sord 79	$	104	Increased Ca	Decreased Nitrate
Polyculture-TerraNova	Poly Terra Nova	$	97	Increased Ca	Decreased Free Lime
Pearl Millet	TiffLeaf3	$	153	Increased S	Decreased Free Lime

Aggregating the gains and losses to soil nutrient availability and quantifying these changes using an associated dollar value is done here, as well, shown on the graphs of Figures 10 - 13. Of note is the relative difference between cultivars within a general crop type, and that not all green manure crops assure a readily-available form of plant nutrients to be cycled back immediately to a future crop. The samples following green manure incorporation were taken 3 weeks after mowing and plowdown. Further nutrient release from these residues is likely through the winter and into the spring, but the potential rate of release is expected to follow the pattern laid out in the graphs on Figures 10 - 13. In addition to standard chemical analyses to determine organic matter content and macro- & micro-nutrient balances, a measure of biologically active carbon (potassium permanganate oxidizable carbon - POXC) was taken on each sample, to serve as an indicator of which green manure crops have supplied the most readily available carbon to power the soil microbial community and move closer to a thriving, healthy soil environment.

Table 4. Detailed differences of fertilizer costs comparing nutrient status prior to cover crop planting with condition of soil following green manure incorporation and partial decomposition.

Green Manure's Effect on Fertilizer Budget For Following Year's Potato Crop

Crop	Cultivar	Soil pH	EC dS/m	Free Lime	OM %	lbs NO3-N/ac	ppm P	ppm K	lbs S/ac	ppm Ca
Black Oats	Soil Saver	$ (24.00)	$ 17.60	$ (12.00)	$ 12.00	$ 37.67	$(25.30)	$52.56	$ 36.50	$ 25.82
Buckwheat	Mancan	$ (12.00)	$ 10.00	$ (18.00)	$ 8.00	$ 27.59	$(17.61)	$24.41	$ 4.93	$ 74.88
Cereal Rye	Elbon	$ (14.00)	$ (1.40)	$ (6.00)	$ 8.00	$ (3.91)	$(16.99)	$21.28	$ 1.48	$ 32.16
Arugula	Trio	$ (16.00)	$ 2.80	$ (18.00)	$ -	$ (2.77)	$(29.64)	$11.56	$ (44.45)	$ 62.50
Ethiopian Cabbage	Corrine	$ (22.00)	$ 40.60	$ (6.00)	$ (8.00)	$ 3.65	$(16.12)	$37.74	$ 40.40	$ (9.07)
Fava Bean	Snowbird	$ (24.00)	$ 4.60	$ (12.00)	$ 12.00	$ 11.84	$(33.11)	$41.89	$ 11.08	$ 40.94
Fodder Radish	Anaconda	$ (20.00)	$ 2.40	$ (6.00)	$ 16.00	$ 24.44	$(26.04)	$46.99	$ 47.20	$ (0.53)
Fodder Radish	Biofum	$ (24.00)	$ 29.20	$ (36.00)	$ 4.00	$ (23.18)	$(30.88)	$40.19	$ 39.75	$(18.58)
Fodder Radish	Cassius	$ (14.00)	$ (11.80)	$ (18.00)	$ 4.00	$ (7.18)	$(25.54)	$15.84	$ 20.85	$(16.46)
Fodder Radish	Defender	$ (22.00)	$ 6.40	$ (18.00)	$ 12.00	$ 8.69	$(17.36)	$27.88	$ 18.70	$ 19.30
Fodder Radish	Doublet	$ (22.00)	$ 18.80	$ (18.00)	$ (0.00)	$ 0.13	$(22.57)	$28.97	$ 27.75	$ 7.39
Fodder Radish	Terra Nova	$ (26.00)	$ 31.00	$ (6.00)	$ 20.00	$ 19.66	$(25.30)	$62.90	$ 58.00	$ 26.59
Forage Oat	Monida	$ (18.00)	$ 9.80	$ (12.00)	$ 8.00	$ 3.53	$(26.66)	$25.16	$ 21.50	$ 1.39
Indian Mustard	Caliente 61	$ (24.00)	$ 20.80	$ (12.00)	$ 12.00	$ 25.96	$(26.66)	$44.13	$ 54.93	$ 16.22
Pearl Millet	TiffLeaf3	$ (20.00)	$ 12.60	$ (24.00)	$ 20.00	$ 17.01	$(20.09)	$41.41	$ 52.88	$ 22.80
Polyculture-Sordan79	Polyculture-Sordan79	$ (19.50)	$ 22.85	$ 6.00	$ 4.00	$ (33.45)	$(15.35)	$30.53	$ (6.65)	$ 90.56
Polyculture-TerraNova	Polyculture-TerraNova	$ (16.00)	$ (10.60)	$ (24.00)	$ 20.00	$ 5.04	$(15.38)	$42.16	$ (6.20)	$ 61.20
Yellow Sweet Clover	YBSC - TH Line	$ (20.00)	$ 22.40	$ (12.00)	$ 8.00	$ (13.10)	$(17.61)	$29.17	$ 41.05	$ (6.82)

Green Manure's Effect on Fertilizer Budget For Following Year's Potato Crop (continued)

Crop	Cultivar	ppm Mg	ppm Na	ppm Zn	ppm Fe	ppm Mn	ppm Cu	ppm B	ppm POXC	Total
Black Oats	Soil Saver	$ (4.43)	$ (7.38)	$ 0.20	$ 9.33	$ (1.24)	$ 13.13	$ 0.69	$ 40.00	**$171.17**
Buckwheat	Mancan	$ (8.10)	$ 0.14	$ 2.24	$ 8.40	$ (3.11)	$ 8.36	$ 0.91	$ 34.40	**$145.44**
Cereal Rye	Elbon	$ (3.08)	$ (2.41)	$ (1.43)	$ 4.67	$ (4.35)	$ 0.00	$ 0.34	$ 26.08	**$ 40.44**
Arugula	Trio	$ (6.26)	$ 0.83	$ (2.04)	$ 11.20	$ (4.98)	$ (2.39)	$ 0.62	$ 21.52	**$(15.50)**
Ethiopian Cabbage	Corrine	$ (0.65)	$ (7.09)	$ 2.24	$ 13.06	$ (0.62)	$ 9.55	$ 0.51	$ 28.40	**$106.60**
Fava Bean	Snowbird	$ (5.45)	$ (3.89)	$ (8.55)	$ 9.33	$ (3.73)	$ 4.78	$ 1.89	$ 20.96	**$ 68.57**
Fodder Radish	Anaconda	$ (2.38)	$ (6.01)	$ (0.61)	$ 5.60	$ (1.24)	$ 13.13	$ 1.80	$ 30.72	**$125.47**
Fodder Radish	Biofum	$ (1.57)	$ (6.05)	$ 0.20	$ 9.33	$ (2.49)	$ (3.58)	$ 0.93	$ 31.84	**$ 9.12**
Fodder Radish	Cassius	$ (1.19)	$ (3.20)	$ (0.81)	$ 11.20	$ (5.60)	$ -	$ (0.11)	$ 12.80	**$(39.21)**
Fodder Radish	Defender	$ (3.24)	$ (2.77)	$ (4.07)	$ 8.40	$ (5.60)	$ (2.39)	$ 2.54	$ 43.20	**$ 71.68**
Fodder Radish	Doublet	$ (0.54)	$ (4.79)	$ (3.87)	$ 7.46	$ (2.49)	$ 25.07	$ 3.04	$ 15.20	**$ 59.56**
Fodder Radish	Terra Nova	$ (7.45)	$ (4.57)	$ (9.37)	$ -	$ (5.60)	$ (2.39)	$ 0.13	$ 48.40	**$180.00**
Forage Oat	Monida	$ 0.38	$ (1.84)	$ -	$ 14.93	$ (2.49)	$ 9.55	$ (0.13)	$ 31.76	**$ 64.88**
Indian Mustard	Caliente 61	$ (3.56)	$ (3.96)	$ 2.65	$ 3.73	$ -	$ 13.13	$ 0.81	$ 35.44	**$159.62**
Pearl Millet	TiffLeaf3	$ (3.51)	$ (4.97)	$ 0.61	$ 8.40	$ 1.87	$ 19.10	$ 1.08	$ 27.92	**$153.11**
Polyculture-Sordan79	Polyculture-Sordan79	$ (4.91)	$ (4.17)	$ (5.75)	$ 10.50	$ (3.42)	$ 4.78	$ 0.10	$ 28.16	**$104.28**
Polyculture-TerraNova	Polyculture-TerraNova	$ (7.02)	$ (1.91)	$ (8.76)	$ 8.40	$ (4.98)	$ 1.19	$ 0.41	$ 53.60	**$ 97.16**
Yellow Sweet Clover	YBSC - TH Line	$ 1.84	$ (6.41)	$ 2.24	$ 14.93	$ (1.87)	$ 17.91	$ 0.18	$ 22.88	**$ 82.79**

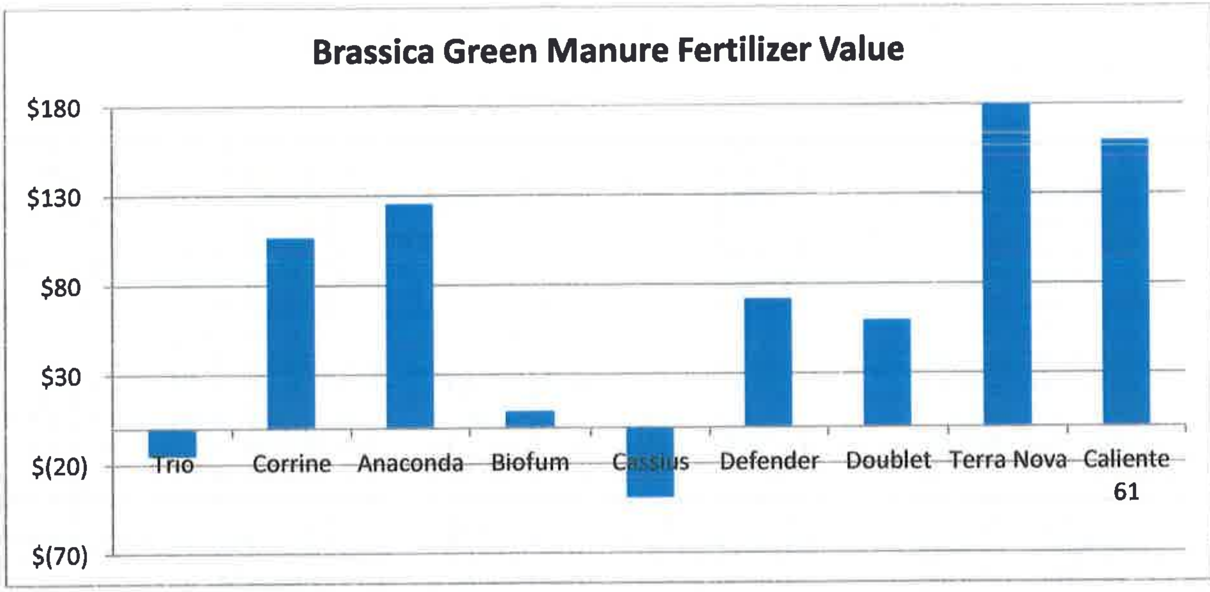

Figure 10. Costs or savings anticipated due to brassica green manuring, relative to the potato fertility budget.

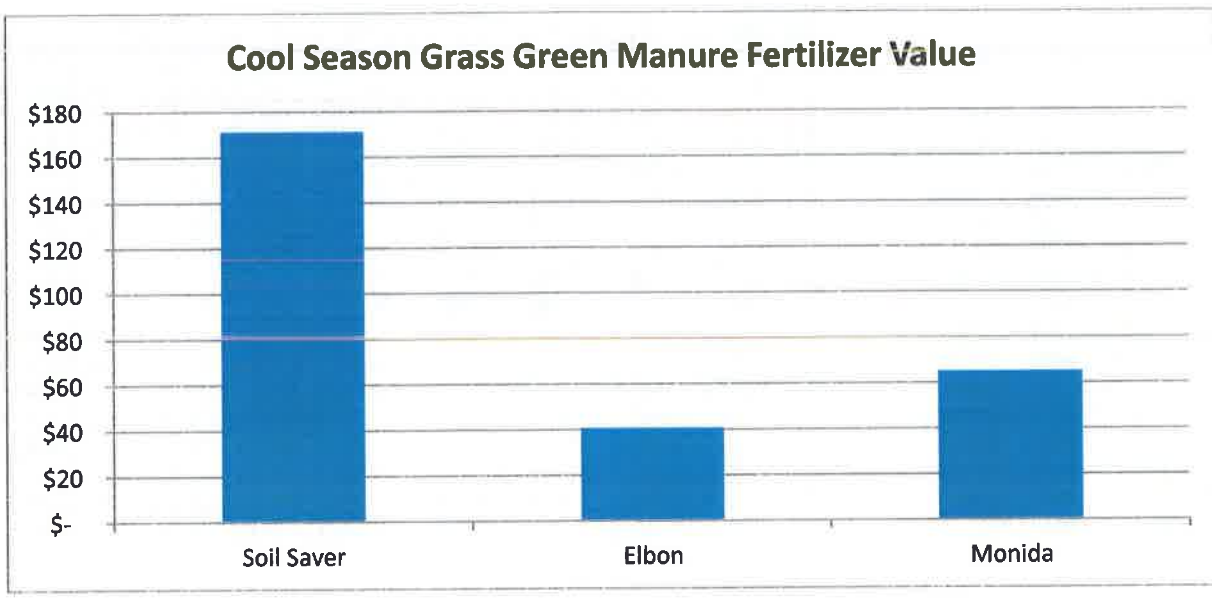

Figure 11. Costs or savings anticipated due to cool season grass green manuring, relative to the potato fertility budget.

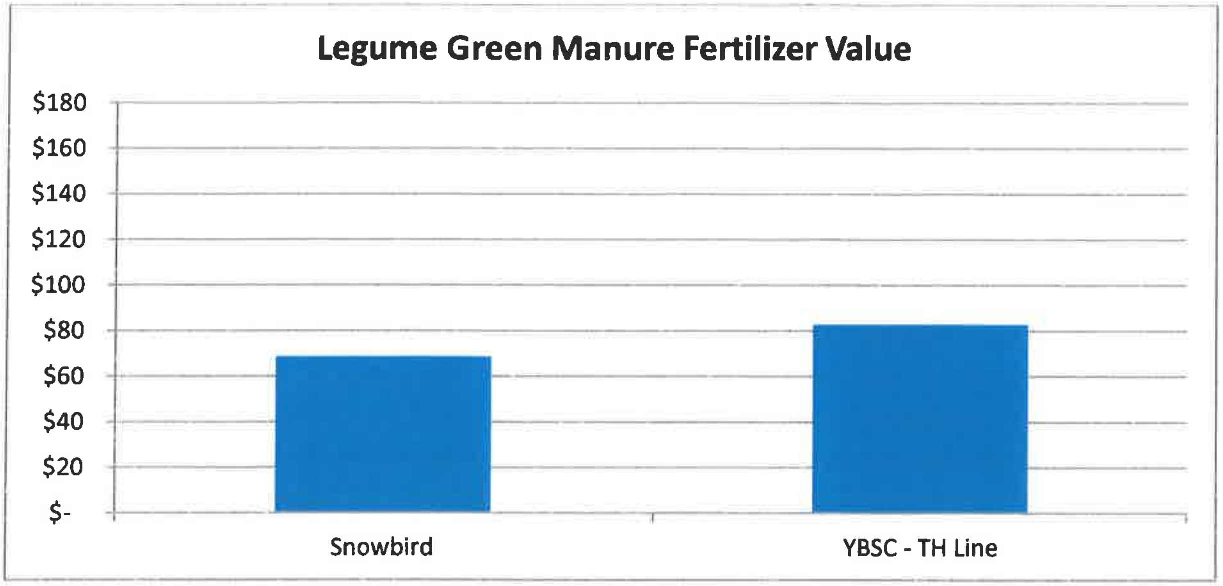

Figure 12. Costs or savings anticipated due to legume green manuring, relative to the potato fertility budget.

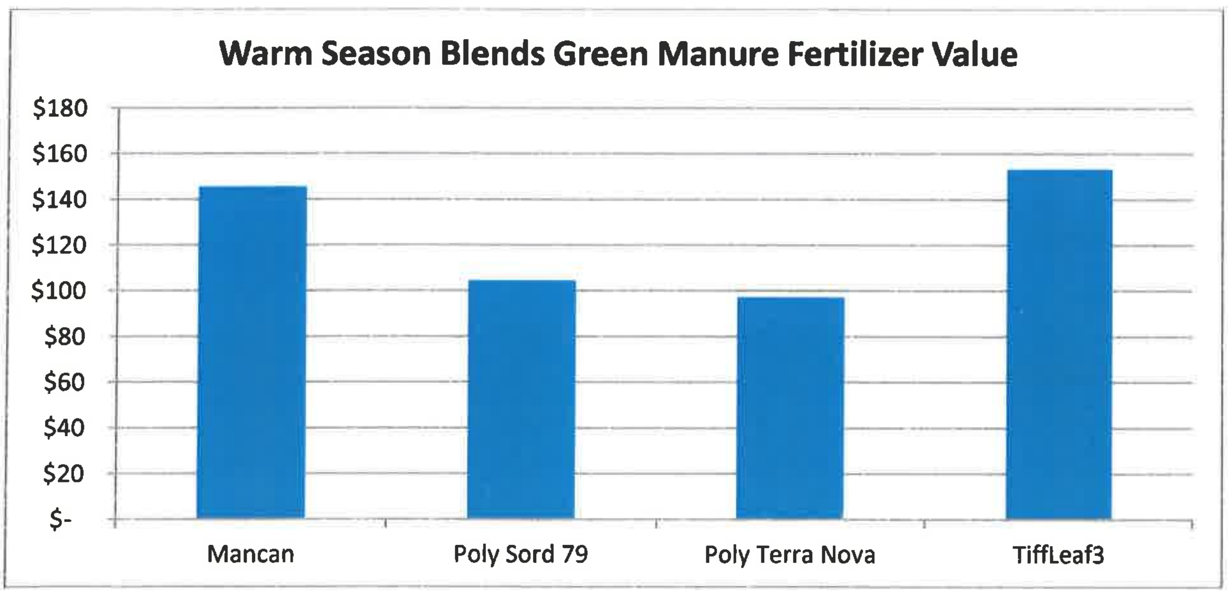

Figure 13. Costs or savings anticipated due to warm season crop green manuring, relative to the potato fertility budget.

Conclusions

The need for rotation crop options that can remain productive while receiving very limited water and fertility inputs persists in our region. Identifying top performers relative to weed competition, water use efficiency and drought tolerance as done here from this set of nineteen cultivars is an important early step in maximizing the productive capacity of our region's farms. Between the 2012 and 2013 CPAC-funded cover crop and green manure trials, numerous promising cultivars stand above the rest in their potential to yield biomass while maintaining soil fertility, or improving it, in anticipation of a potato crop to follow. Further study regarding the full spectrum of the uses, economic potentials, and the possible limitations for sustained use in potato rotations should continue. The choice of cover crop, or blends of cover crops, is a very particular decision to be weighed carefully, taking into account the goal you have for that particular field, and the goal you have for your farm as a whole. The observations related in this report can serve as a starting point to help guide you along that process, but hopefully your inquiry will not end there. Much more is to be learned, and additional resources and information on these crops and cultivars continues to be generated. We can work towards a short-list of crop types and cultivars useful for our region, but it is unlikely we will have the experience of one-size-fits-all potato farmers in the San Luis Valley. Your operation is unique, the concerns of each field are particular, as are the goals you have for how you will grow the food you produce. I recommend you use this research as your starting point in considering cultivars and crop types, and expand your inquiry from there.

Sincerely,

Patrick O'Neill

Patrick O'Neill

Agronomist / Certified Crop Adviser