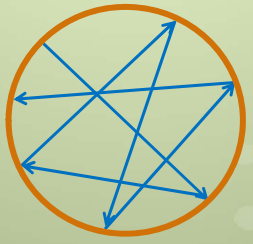
Animal Performance

By

Ian Mitchell-Innes

Whole Under Management

Holistic Goal



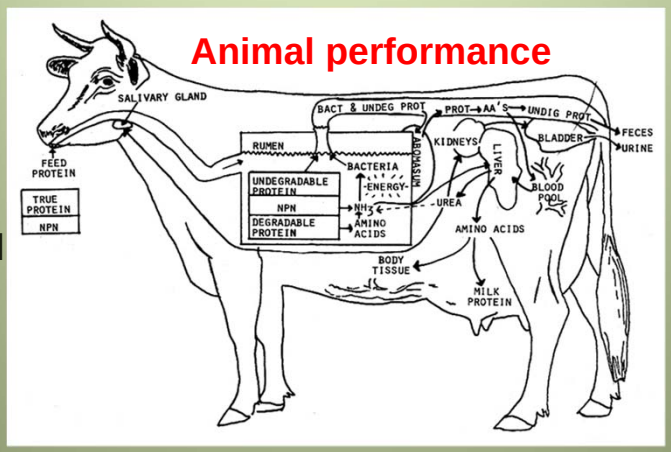
Water Cycle | Mineral Cycle | Energy Flow | Community Dynamics

- Tools
- Testing Guidelines
- Planning Procedures
- Monitor

The Whole

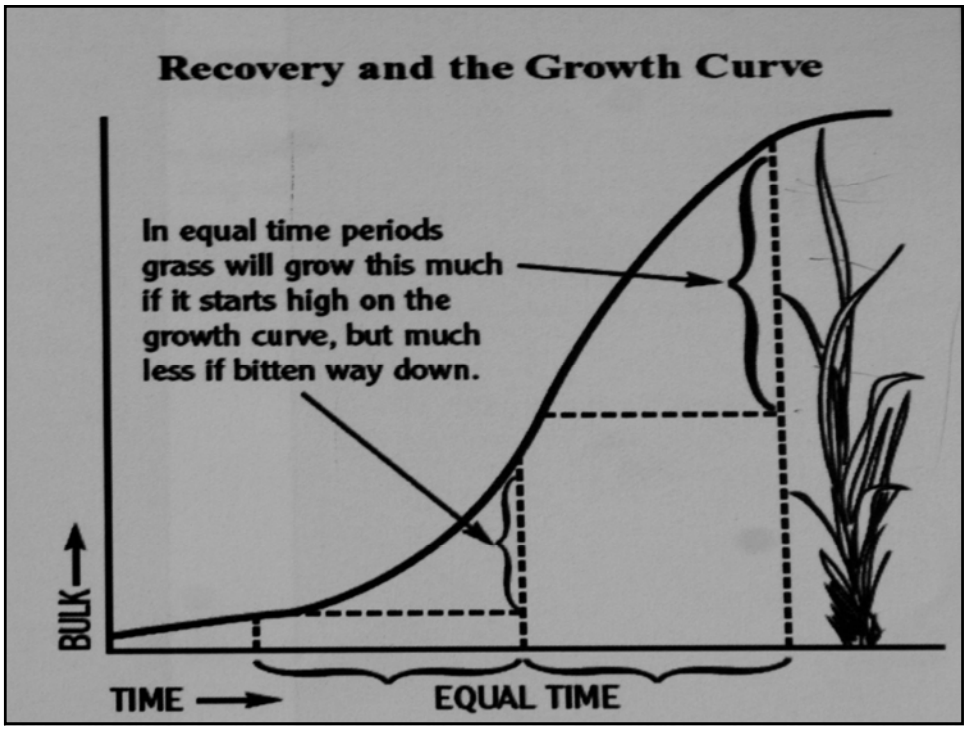
Animal performance

Animal

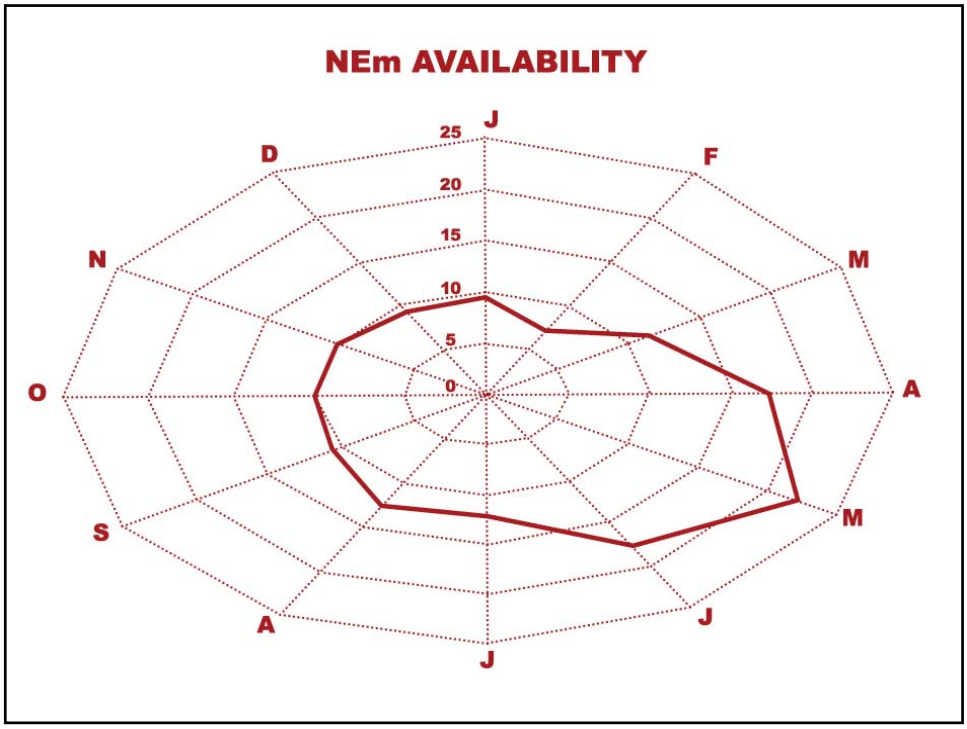


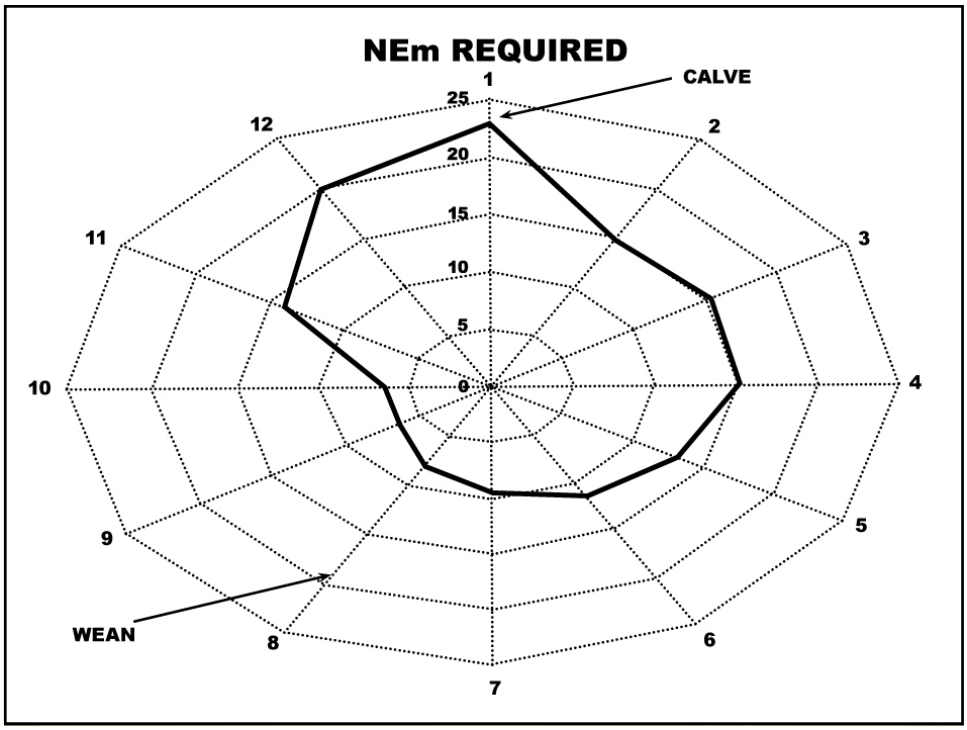
Soil

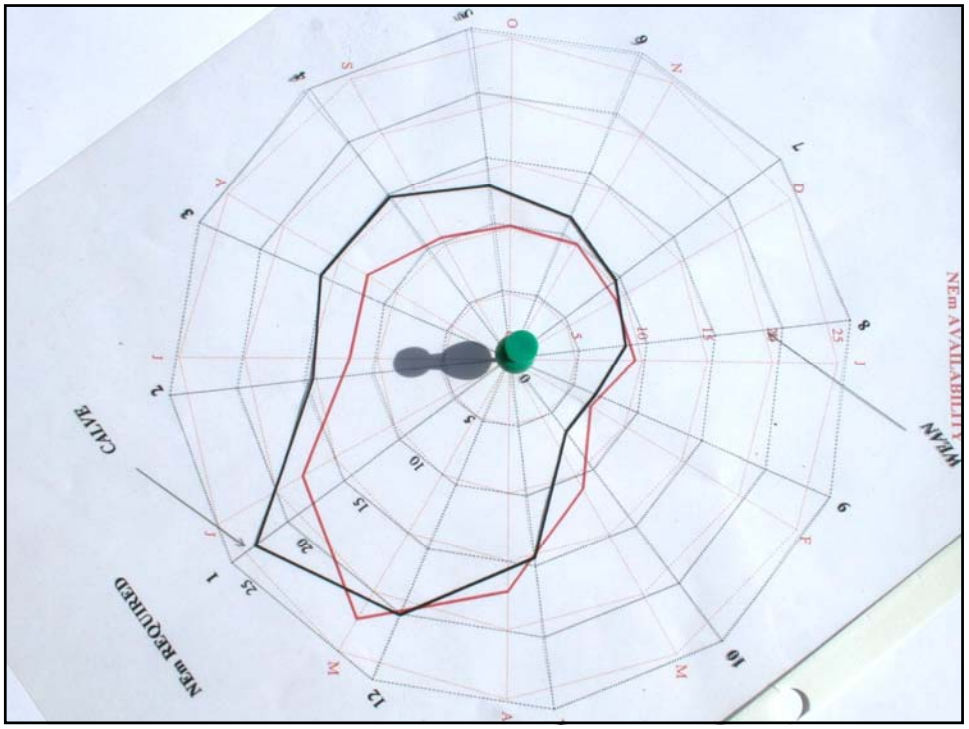
Grass




Allow for selection to
achieve animal Performance
At least cost


NEm AVAILABILITY
J
F
M
A
M
J
J
A
S
O
N
D
25
20
15
10
5
0


NEm REQUIRED
CALVE
WEAN
1
2
3
4
5
6
7
8
9
10
11
12
25
20
15
10
5
0



IAN MITCHELL-INNES

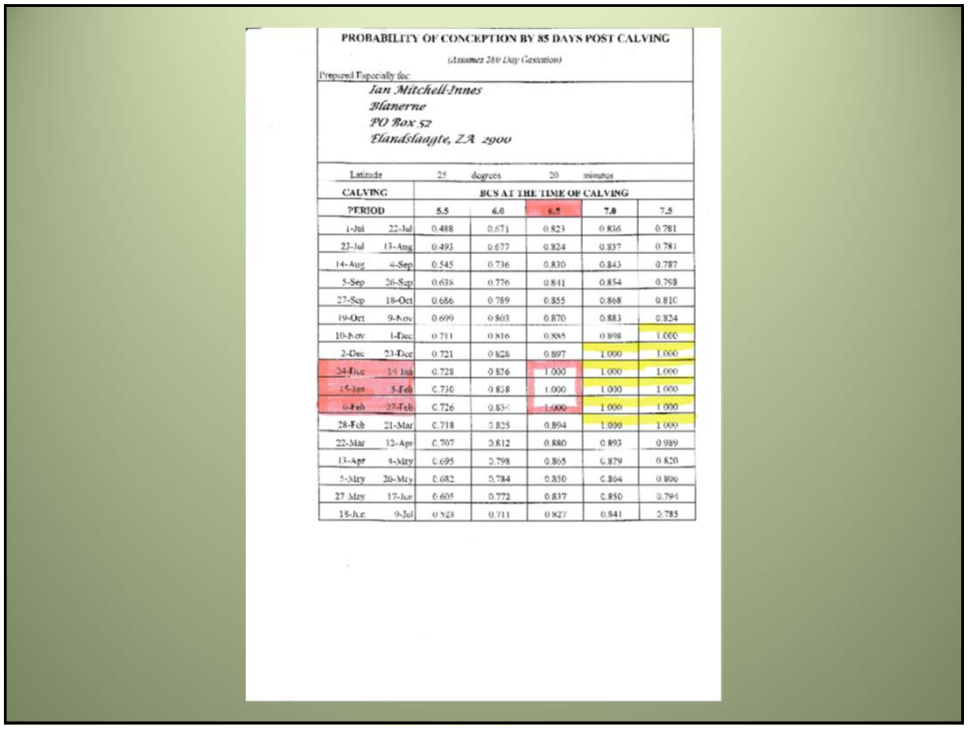
Date 5/5/2012

WORKSHEET

Planning Sheet Column Reference BIOLOGICAL

Worksheet No. 1

	January	February	March	April	May	June	July	August	September	October	November	December	
CALVES	8	9	10	11		1	2	3	4	5	6	7	Total
HEIFERS 1	20	21	22	23	12	13	14	15	16	17	18	19	
HEIFERS 2	32	33	34	35	24	25	26	27	28	29	30	31	
COWS	+	+	+	+	36	37	+	+	+	+	+	+	
BULLS													
STEERS 1	20	21	22	23	12	13	14	15	16	17	18	19	
STEERS 2	32	33	34	35	24	25	26	27	28	29	30	31	
CALVING													
BULLING													
ANIMAL PERFORMANCE													
MARKETING													
DEHORNS VAC													
WEAN													
Total													



PROBABILITY OF CONCEPTION BY 85 DAYS POST CALVING

(Assumes 280 Day Gestation)

Prepared Especially for:

Ian Mitchell-Innes
Blanerne
PO Box 52
Elandslaagte, ZA 2900

Latitude 25 degrees 20 minutes

CALVING PERIOD		BCS AT THE TIME OF CALVING				
		5.5	6.0	6.5	7.0	7.5
1-Jul	22-Jul	0.488	0.671	0.823	0.836	0.781
22-Jul	13-Aug	0.493	0.677	0.824	0.837	0.781
14-Aug	4-Sep	0.545	0.736	0.830	0.843	0.787
5-Sep	26-Sep	0.638	0.776	0.841	0.854	0.798
27-Sep	18-Oct	0.686	0.789	0.855	0.868	0.810
19-Oct	9-Nov	0.699	0.803	0.870	0.883	0.824
10-Nov	1-Dec	0.711	0.816	0.885	0.898	1.000
2-Dec	23-Dec	0.721	0.828	0.897	1.000	1.000
24-Dec	14-Jan	0.728	0.836	1.000	1.000	1.000
15-Jan	5-Feb	0.730	0.838	1.000	1.000	1.000
6-Feb	27-Feb	0.726	0.834	1.000	1.000	1.000
28-Feb	21-Mar	0.718	0.825	0.894	1.000	1.000
22-Mar	12-Apr	0.707	0.812	0.880	0.893	0.989
13-Apr	4-May	0.695	0.798	0.865	0.879	0.820
5-May	26-May	0.682	0.784	0.850	0.864	0.806
27-May	17-Jun	0.605	0.772	0.837	0.850	0.791
18-Jun	9-Jul	0.628	0.711	0.827	0.841	0.785

Energy

- Energy is Money
- Money is Energy
- Time is Money
  - and
- Water is Money

Energy Values

- **Carbon** 9,000 calories per gram
- **Hydrogen** 25,000 calories per gram
- **Oxygen** - 3,125 calories per gram

Oxygen 40.5%

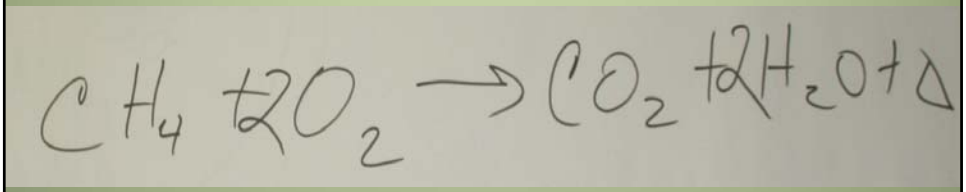
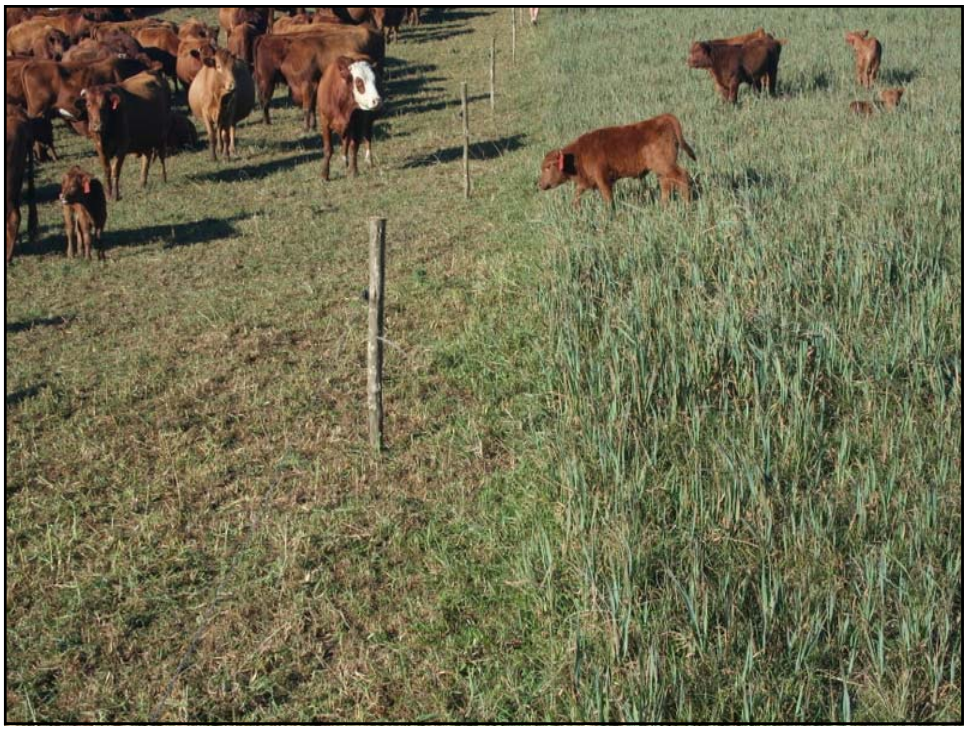


Table 4. Hydrogen And Corresponding Protein Requirements For Desired Production in Cattle

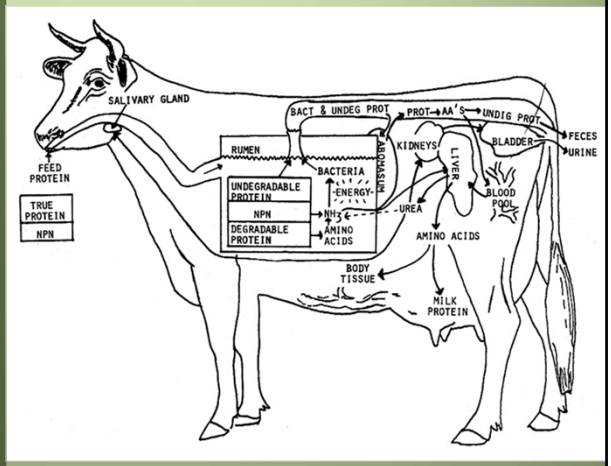
Liveweight Gain kg/day	Milk kg/day	Fat kg/day	O %	When is . H %	N %	Require Protein %
-0.2	0.0	0.0	40.5	5.7	0.48	3.0
0.0	0.0	0.0	40.5	5.8	0.64	4.0
0.2	7.1	68.0	40.5	5.9	0.80	5.0
0.5	10.2	98.0	40.5	6.0	0.96	6.0
0.7	14.4	125.0	40.5	6.1	1.12	7.0
0.9	16.5	159.0	40.5	6.2	1.28	8.0
1.1	19.6	187.0	40.5	6.3	1.44	9.0
1.4	22.6	216.0	40.5	6.4	1.60	10.0
1.6	25.6	245.0	40.5	6.5	1.76	11.0
1.8	28.8	275.0	40.5	6.6	1.92	12.0
2.0	32.2	307.0	40.5	6.7	2.08	13.0
2.3	36.4	348.0	40.5	6.8	2.24	14.0
2.5	40.9	391.0	40.5	6.9	2.40	15.0
2.7	45.9	435.0	40.5	7.0	2.56	16.0
2.9	50.5	472.0	40.5	7.1	2.72	17.0

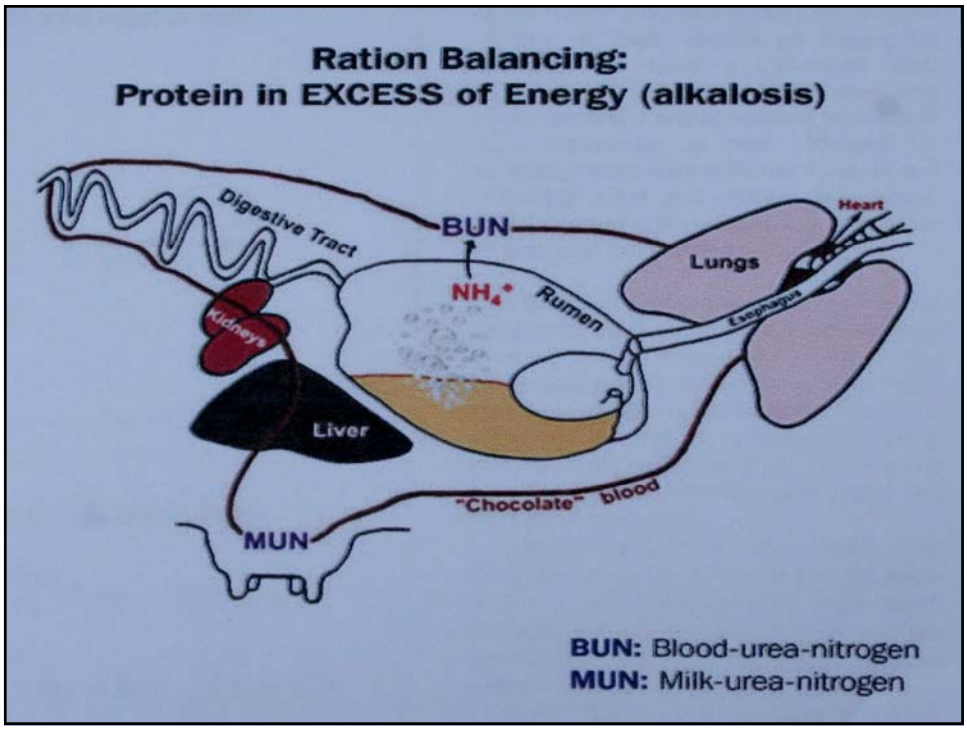

Animal Performance

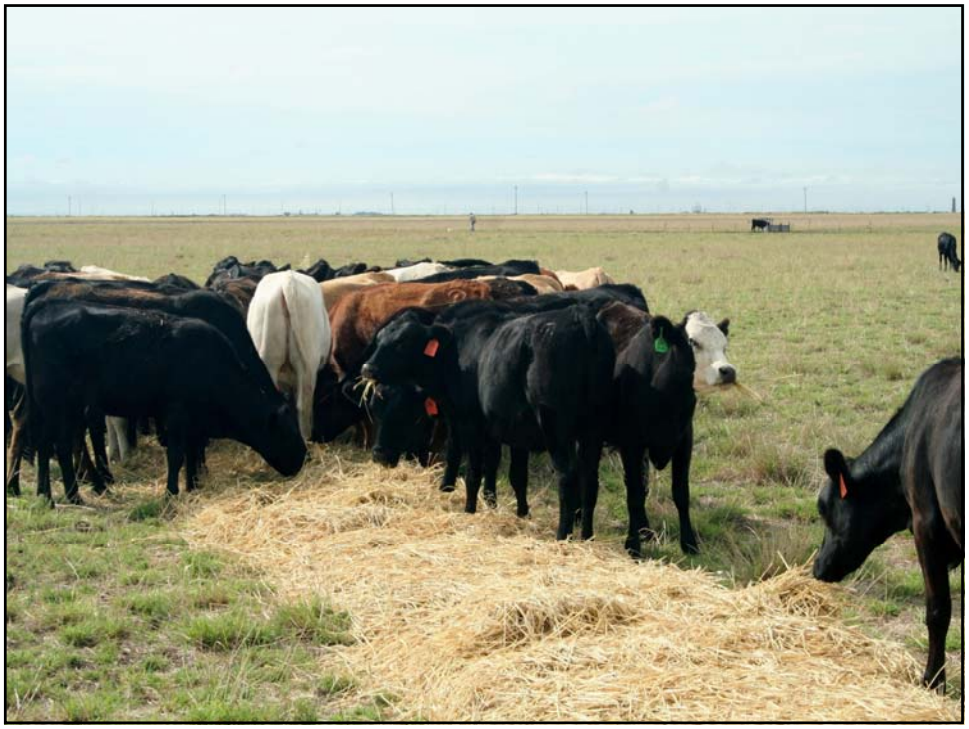


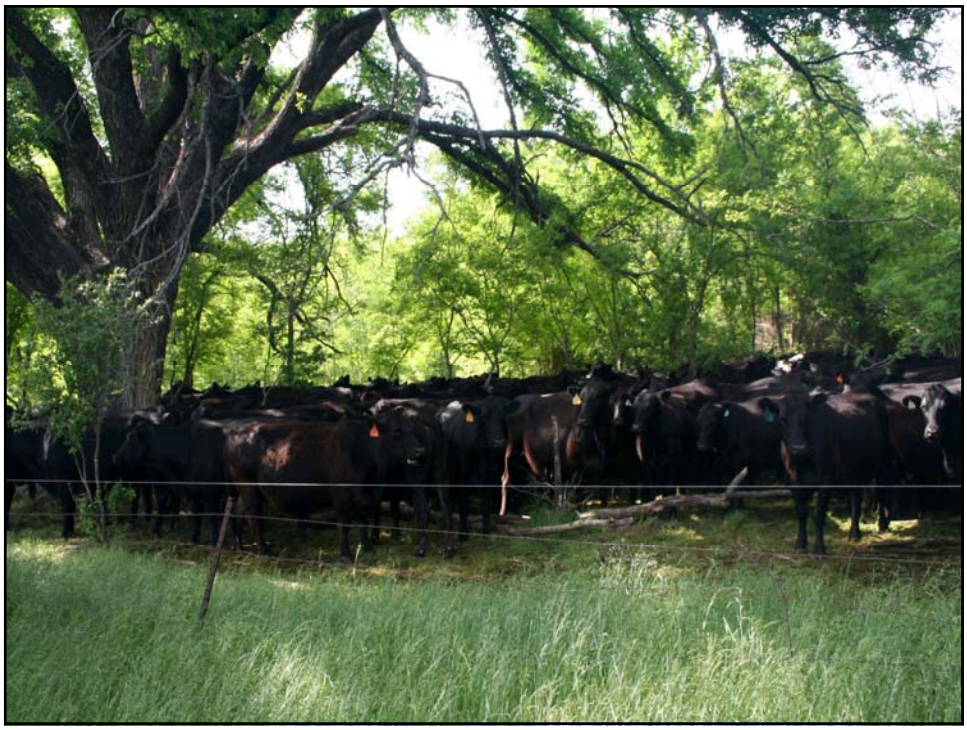
Nutrition

1. Carbon
2. pH
3. Protein
4. Energy
5. Water
6. Minerals



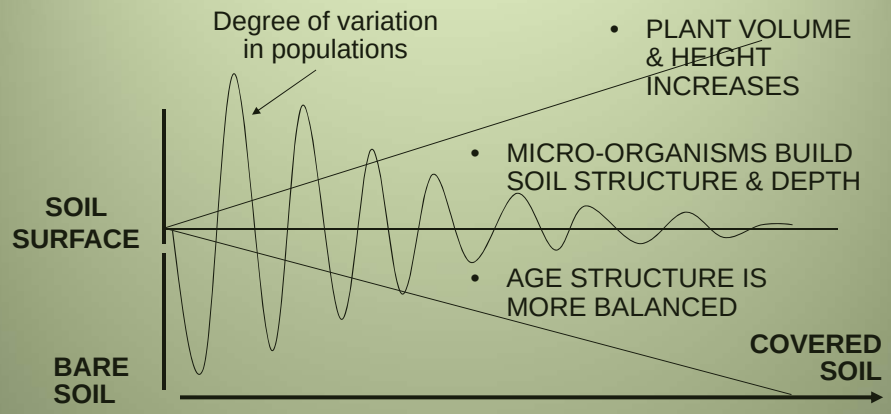







Levels of Energy

COMMUNITY DYNAMICS (Succession)



SOIL SURFACE CONDITION IS KEY

SIMPLE COMMUNITY
GREAT FLUCTUATION

COMPLEX COMMUNITY
STABILITY

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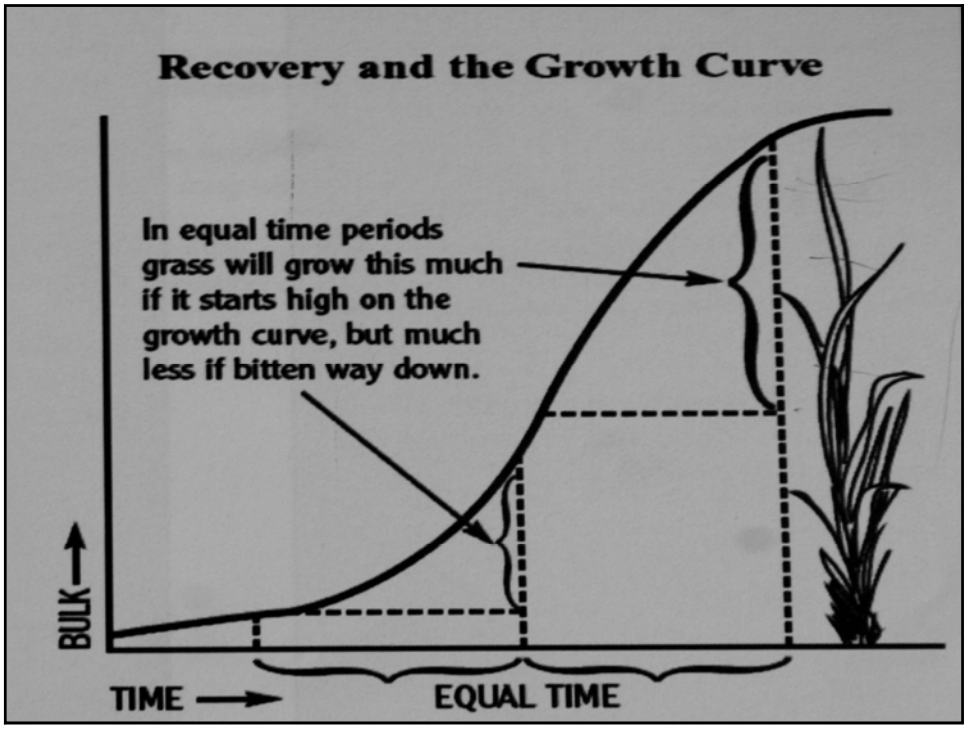
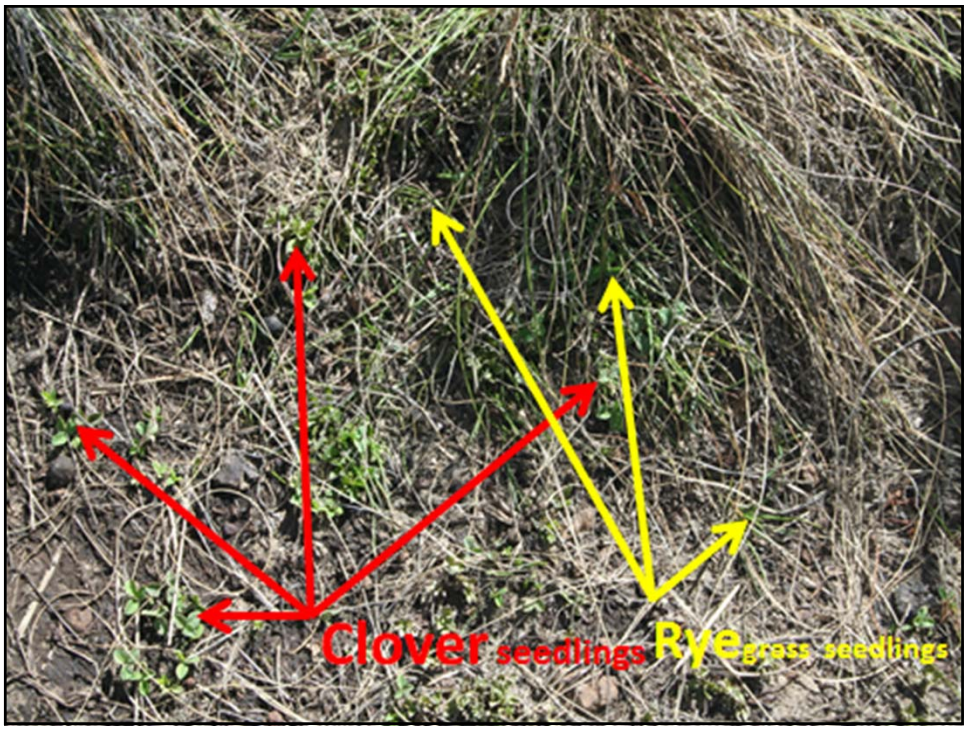
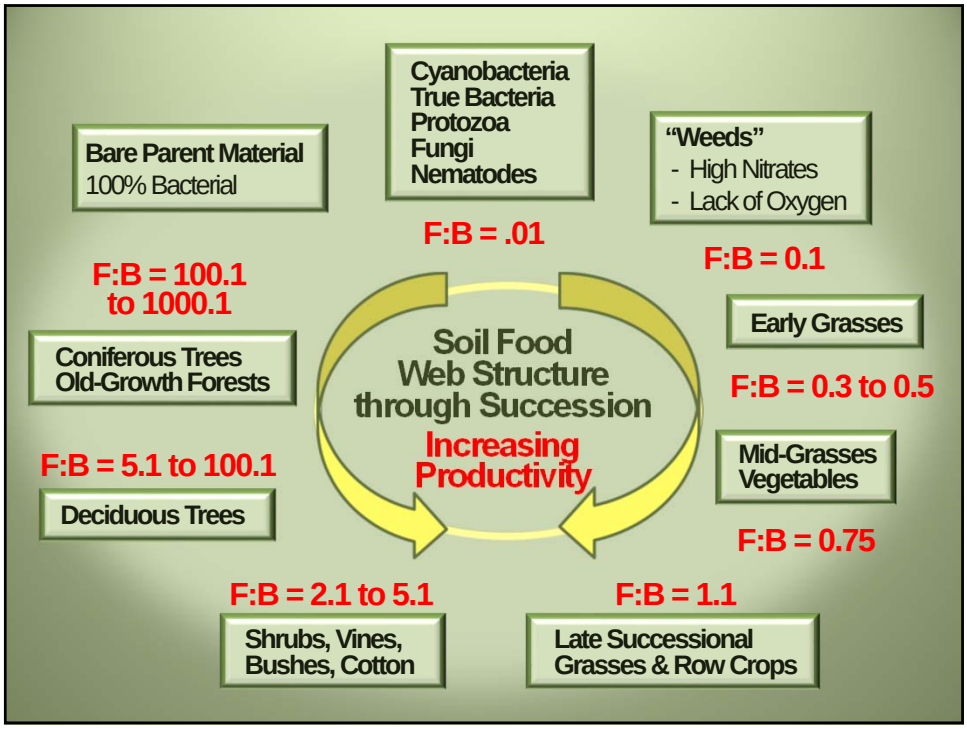
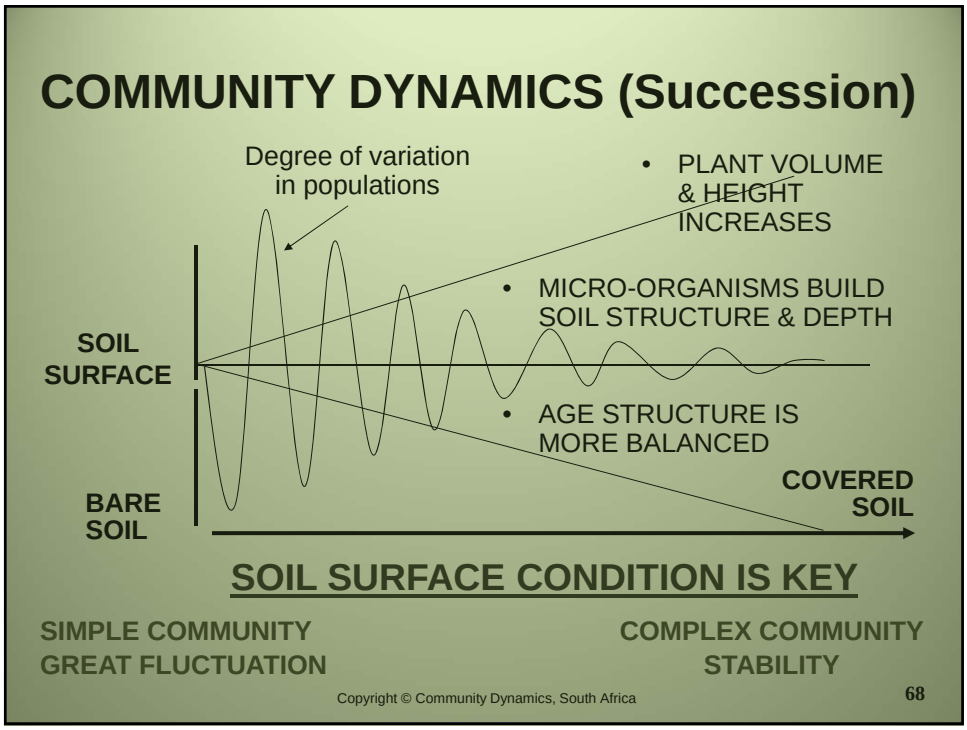

Recovery and the Growth Curve
In equal time periods grass will grow this much if it starts high on the growth curve, but much less if bitten way down.
BULK
TIME
EQUAL TIME


20/02/2015 17:46
Inclusion Zone


20/02/2015 17:44


Clover seedlings
Ryegrass seedlings


Bare Parent Material
100% Bacterial
Cyanobacteria
True Bacteria
Protozoa
Fungi
Nematodes
"Weeds"
- High Nitrates
- Lack of Oxygen
F:B = .01
F:B = 0.1
F:B = 100.1 to 1000.1
Coniferous Trees
Old-Growth Forests
Soil Food Web Structure through Succession
Increasing Productivity
Early Grasses
F:B = 0.3 to 0.5
F:B = 5.1 to 100.1
Deciduous Trees
Mid-Grasses
Vegetables
F:B = 0.75
F:B = 2.1 to 5.1
Shrubs, Vines, Bushes, Cotton
F:B = 1.1
Late Successional Grasses & Row Crops


COMMUNITY DYNAMICS (Succession)
Degree of variation in populations
• PLANT VOLUME & HEIGHT INCREASES
• MICRO-ORGANISMS BUILD SOIL STRUCTURE & DEPTH
• AGE STRUCTURE IS MORE BALANCED
SOIL SURFACE
BARE SOIL
COVERED SOIL
SOIL SURFACE CONDITION IS KEY
SIMPLE COMMUNITY
GREAT FLUCTUATION
COMPLEX COMMUNITY
STABILITY
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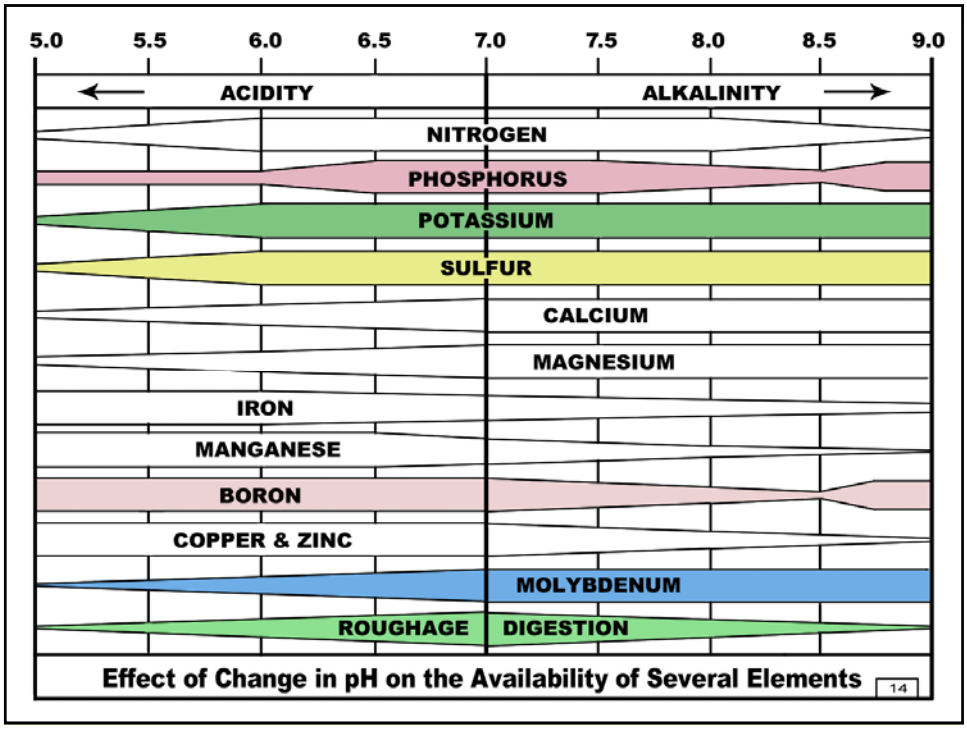
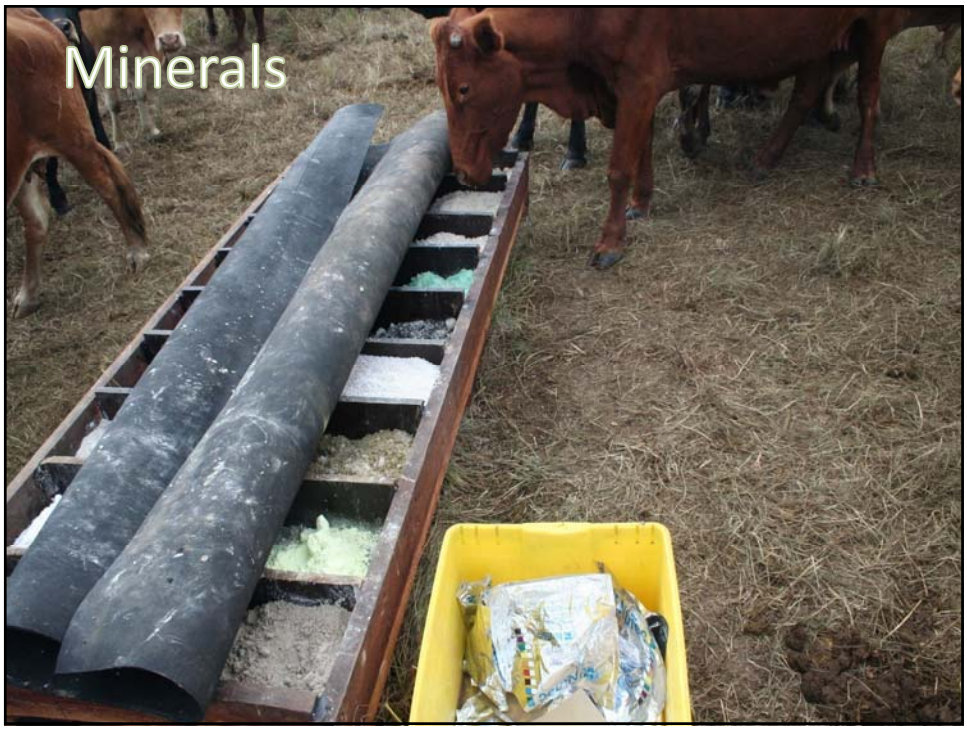

5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0
ACIDITY
ALKALINITY
NITROGEN
PHOSPHORUS
POTASSIUM
SULFUR
CALCIUM
MAGNESIUM
IRON
MANGANESE
BORON
COPPER & ZINC
MOLYBDENUM
ROUGHAGE
DIGESTION
Effect of Change in pH on the Availability of Several Elements
14


Minerals