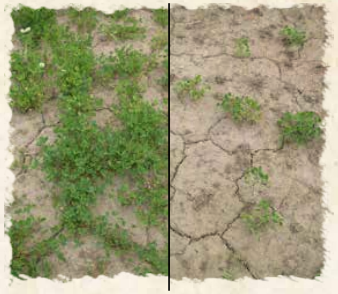
FIXATION VARIETAL BACKGROUND

Grassland Oregon has been investigating the potential of annual clovers for both a forage and nitrogen source. Escalating fertilizer prices as well as an increased interest in the utilization of cover crops in the Midwestern United States led us to believe that there would be a demand for a forage/nitrogen fixing legume that could fill that particular need. FIXatioN is the result of our efforts.

FIXatioN matures approximately 14 days later than Dixie Crimson Clover and as much as 28 days later than other commercially available Balansa varieties. Despite being later in maturity, overall growth is greater than that of the earlier maturing Balansa clover varieties throughout the growing cycle. The later maturity allows for multiple cuttings/grazing and reduces the likelihood of unwanted re-seeding. Fully developed plants exhibit excellent re-growth, and recover more rapidly than other clovers.

Forage yield is quite impressive, yielding as much as 5,250 lbs of extremely digestible dry matter in a single cutting. Plants are able to support growth up to 3 feet high with stems as long as 8 feet long. Crude protein levels range from 22% to 28.4% with relative feed values measured as high as 277.



FIXATION BALANSA CLOVER VS. DIXIE CRIMSON CLOVER

Broadcast seeding on unprepared seedbed 60 days after seeding (planted May 11, 2011).

STEM OF FIXATION BALANSA CLOVER

Stems of FIXatioN Balansa Clover can reach up to 8 feet long with a forage yield of up to 5,250 lbs/acre.

STEM OF DIXIE CRIMSON CLOVER

PLANTING INSTRUCTIONS

	Monoculture	In Mixes
Seeding Rate	5 lbs/acre drilled 8 lbs/acre broadcast	3 lbs/acre drilled 5 lbs/acre broadcast
Planting Depth	1/8 – 1/4 inch	
Ideal Soil	Soil pH of 4.5-8.0, tolerates poorly drained soils with moderate salinity.	

FIXatioN balansa clover has proven again and again to truly be an innovative step in seed research and sustainable agriculture. Not only does it save us from the rising cost of commercial inputs, it saves our soil from the detrimental and erosive effects of those inputs. The results: higher yields, healthier soil, and a cleaner earth.

Novel solutions for growing concerns.

GO

GrasslandOregon.com

NEW!

FIXatioN BALANSA CLOVER

We've combined the best in forage and cover crop research to find an effective new solution for your growing concerns.

GO

BACKGROUND

Balansa clover, *Trifolium michelianum*, is a cool-season annual legume that is native to the northeastern Mediterranean region. Balansa clover is capable of high forage performance over an extremely wide range of soils and offers great performance on both acid and alkaline soils (pH4.5 to pH 8.3). The species is quite tolerant of waterlogged soils and can even withstand short periods of flooding. Balansa clover is mildly tolerant to saline soils.

Balansa clover can be used in mixtures with other legumes and grasses in pasture situations, where it can re-generate from seed under proper management conditions. In pasture applications, Balansa clover will not only improve the quality and yield of the forage, but it can also create substantial quantities of nitrogen. This improves both the quality and quantity of forage long after the clover has reached the end of its life cycle.

Other applications include silage (by itself or in rotation with corn silage), as a cover crop for nitrogen production and weed control, and in over-seeding warm season grasses and crops that can utilize the nitrogen created by the clover over the winter months.

Balansa clover is quick to germinate, however the first stage of its growth is spent in forming a multi-branched rosette emerging from a single taproot.

During this stage Balansa is somewhat vulnerable to competition as the branches are close to the ground. Survival can be increased by sowing into a clean weed-free seedbed or by grazing/mowing competing species. This growth pattern allows Balansa to persist under intensive grazing regimens. It will continue to form branches under grazing pressure. As temperatures warm or grazing pressure is reduced the stems will turn upright, forming a multi-branched hollow stem with copious amounts of plant mass up to 3 feet high.

As the plant matures it will continue to grow and produce blossoms that are very attractive to pollinators. Balansa clover is capable of producing large amounts of hard seed and if managed properly can regenerate itself from seed for up to 3 years.

Cover Crop

FIXatioN performs best when fall seeded. The rosette growth habit that hugs the ground assists FIXatioN in its ability to withstand cold temperatures.

In laboratory studies FIXatioN survived an experiment in which clover plants were taken from 65 degrees Fahrenheit during the day and placed in a cold growth chamber overnight that was set at 5 degrees Fahrenheit. FIXatioN has survived winter temperatures as low as 5 degrees with no snow cover. In the early spring as temperatures begin to warm up, stems begin to elongate and quickly outgrow the weed population. In Oregon field trials, FIXatioN was able to outgrow and smother rogue daikon radish plants that had not winter-killed.

FIXATION HAS SURVIVED WINTER TEMPERATURES AS LOW AS 5°F WITH NO SNOW COVER.

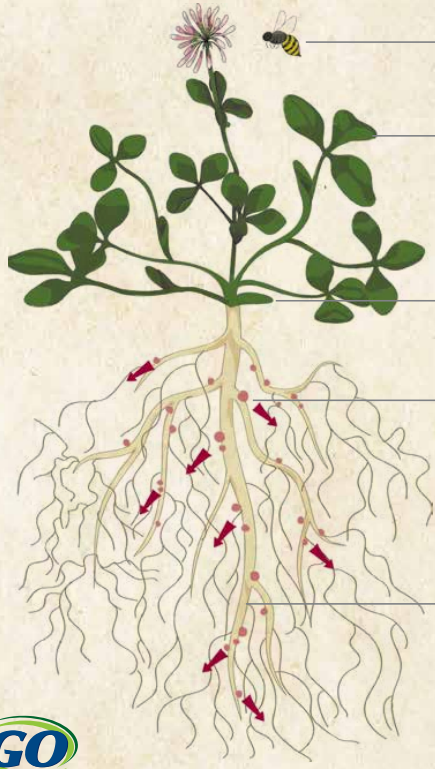
Forage

FIXatioN will aggressively produce forage in the spring – early summer months. Well established fields are capable of withstanding multiple cuttings/grazings. FIXatioN plants retain actively growing leaves from the tip of the stem to the rosette at the soil surface. This growth habit allows for better recovery than seen in Crimson, Arrowleaf, and other annual clovers. FIXatioN is capable of re-seeding if properly managed. Fields allowed to re-seed will need to have new seed applied after the third year as the populations will begin to thin. FIXatioN is capable of surviving water-logged soils and even short-term flooding.

FIXatioN can be frost seeded by broadcasting on established pastures. The small seed size and hardiness of FIXatioN allow it to successfully be broadcast, and establish under proper management in existing forage. Recent studies in New Zealand show that Balansa clover is a better component in pasture mixes than white clover. This is because the life cycle of the Balansa clover is ending when the grass component of the pasture is becoming stressed, leaving the available moisture and nutrients for the grass.

FIXatioN also excels in pastures because the nitrogen collected in the plant material is released annually back into the soil for the use of the grasses. Perennial clovers, such as white clover, will utilize the majority of the nitrogen that they create for their own preservation giving up little to the grasses. FIXatioN has a tap root structure that will delve deep into the soil, pulling up nutrients that can later be used for grasses. The deep root structure will pull moisture from below the root profile of the grasses and will not compete for limited moisture as will white clover.

The root systems of the grasses make use of the rooting pathways created by FIXatioN and as a result can go deeper into the soil profile increasing the summer performance of the grasses. The high forage quality of Balansa clover also makes it an excellent choice for over-seeding/ frost-seeding into alfalfa hay fields. The clover will thrive were the alfalfa is likely to succumb, filling in wet areas and other bare spots and thereby improving yields and quality.



ATTRACTANT

Attracts beneficial insects and pollinators.

INCREASED FORAGE

High dry matter yields. Crude protein levels range from 22% to 28% with relative feed values measured as high as 277. *(See forage analysis)*

PERSISTENT

Growth pattern allows balansa to persist under intensive grazing regimens.

SOIL BUILDING

Nitrogen collected in the plant material is released annually back into the soil. FIXatioN roots penetrate deeper levels of the soil profile, drawing nutrients that are subsequently made available to neighboring plants.

AERATION/ WATER INFILTRATION

Deep tap root allows balansa to break up soil compaction. It pulls moisture from below the root profile of grasses and will not compete for limited moisture.

FIXATION BALANSA CLOVER

ENDURO BALANSA CLOVER

OTHER KEY BENEFITS

- Suitable for weed suppression
- Creates channels for rainfall to penetrate deep into the soil
- Performs well in mixes with other cover crops
- Inherent cold tolerance allows it to be either fall sown or frost seeded
- Suitable as a cover crop in ley farming dryland systems
- Small seed size and breeding process allows it to establish and perform well on compacted soils
- Capable of excellent performance under multi-cut/ grazing systems.
- Tolerant of wet soils

Wildlife

Balansa clover is suitable for use in wildlife mixes. It is high in crude protein and has been a favorite food source for deer and waterfowl in all of our forage trials across the USA. As a highly digestible forage, the high protein levels are readily available to the deer leading to larger racks and body mass.

FORAGE TESTING LABORATORY

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Ph: 800.496.3344 Fax: 607.257.1350
www.dairyone.com

Lab received: 05/04/11
Date printed: 05/05/11
Lab use: .936

KIND DESCRIPTION	CODE	LAB SAMPLE
LEGUME PASTURE	010	16525310

DESCRIPTION 1
FIXATION BALANSA CLOVER

ANALYSIS RESULTS

COMPONENTS	AS SAMPLED BASIS	DRYMATTER BASIS
% Moisture	87.2	
% Dry Matter	12.8	
% Crude Protein	**3.6**	**28.4**
% Available Protein	3.5	27.3
% ADICP	.1	1.1
% Adjusted Crude Protein	3.6	28.4
Soluble Protein % CP		39
Degradable Protein % CP		72
% NDICP	.7	5.1
% Acid Detergent Fiber	2.2	17.1
% Neutral Detergent Fiber	3.3	25.4
% Lignin	.5	4.2
% NFC	4.8	37.5
% Starch	.4	2.9
% WSC (water Sol. Carbs.)	2.2	17.4
% ESC (Simple Sugars)	2.2	17.1
% Crude Fat	.5	4.0
% Ash	1.26	9.86
% TDN	9	71
NEL, Mcal/Lb	.10	.79
NEM, Mcal/Lb	.10	.77
NEG, Mcal/Lb	.06	.49
Relative Feed Value		**277**
% Calcium	.12	.96
% Phosphorus	.05	.39
% Magnesium	.03	.22
% Potassium	.38	2.95
% Sulfur	.04	.35
% Chloride Ion	.04	.35
% Lysine	.19	1.47
% Methionine	.06	.45
Horse DE, Mcal/Lb	.17	1.3

ENERGY TABLE – NRC 2001

	Mcal/Lb	Mcal/Kg
DE, 1X	1.53	3.36
ME, 1X	1.34	2.95
NEL, 3X	0.79	1.74
NEM, 3X	0.83	1.83
NEG, 3X	0.54	1.20
TDN1X, %	71	