

# TALL FESCUE TURFGRASS STARTER FERTILIZER EXPERIMENT

David Casnoff, Ph. D 1995-1996

Two starter fertilizer experiments started September 3, 1995 to July 20, 1996 were conducted to study the differences, if any, in the establishment rates on two different cool season grasses of four different fertilizer formulations; two natural base Sustane products, one all-natural Sustane and one conventional synthetic starter fertilizer:

1. Sustane 5-2-4 w/ Iron
2. Sustane 4-6-4 Natural Organic
3. Sustane 12-2-8 + Polyon
4. 19-27-10 inorganic starter fertilizer

Experimental Field plan for Tall Fescue and Kentucky bluegrass Starter Fertilizer Trials

A **tall fescue** blend (Taurus, Wrangler, and Aztec) was seeded on September 3, 1995 at a rate of 6 lb./1000 square feet, and on separate plots a **Kentucky bluegrass** blend (Gnome, Glade, Aspen, and Trenton) was seeded at a rate of 2 lb./1000 square feet. The fertilizers were applied at 1 lb. N/1000 square feet as follows:

1 lb. N on September 20, 1995, 1 lb. N on November 3, 1995, and 1 lb. N on April 10, 1996. No other fertilizer applications were made. No supplemental water was used due to the fact that there was ample rain. The experimental model used in these establishment studies for both Kentucky bluegrass and tall fescue was randomized complete block design. There were 6 replicates of each fertilizer treatment. All plots were 10' x 10' in size. The entire plot area was mowed once a week in the spring and fall, and when needed during the summer months.

The following data was taken for each of the above plots for both the tall fescue and Kentucky bluegrass experiments [All data was analyzed using MSTAT from Michigan State University.]:

1. Percent turfgrass cover (measured as % verdure)
2. Turfgrass quality on a 0-10 basis:
  - 0 = Dead turf
  - 5 = Acceptable turfgrass quality for a home lawn
  - 6 = Acceptable turfgrass quality for sports field
  - 10 = Best quality rating
3. Number of plants per square decimeter. I used a square decimeter coring device and took two samples per plot (i.e.: 12 samples per treatment)
4. Number of tillers per plant. I took a sample of 5 plants per plug (i.e.: 60 samples per treatment).

In general, the plots fertilized with Sustane 4-6-4 Natural Organic produced the quickest established plots (100% cover at 47 days after seeding), most likely due to a higher number of tillers produced per plant. In both the bluegrass and tall fescue studies, no significant differences in the numbers of plants per square decimeter were found for any of the treatments used. Hence the differences the density of the plot, which were highly correlated with the turfgrass quality ratings, could be explained in a large part due to greater numbers of tillers produced per plant in the plots fertilized with the Sustane 4-6-4 formulation.

The Sustane 4-6-4 treated plants were capable of producing more tillers most likely due to the following:

- More efficient use of the available phosphorus for ATP production.
- More dry matter production due to possible higher rates of carbon fixing.

Physiologically, there seems to be an inherent advantage to the Sustane 4-6-4 starter fertilizer formulation, as far as the plant is concerned, that can't be explained by the rate of phosphorus applied, alone. If this [P levels] were the only factor, one would expect the inorganic starter fertilizer to produce similar results to the Sustane 4-6-4 formulation. The Sustane 4-6-4 formulation is clearly superior to the 19-27-10 inorganic formulation. The following data is presented to corroborate the above conclusions.

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Mean turfgrass quality ratings for four fertilizer treatments on Tall Fescue.  
Means with the same letter are not significantly different from each other.

Date	05/03/96	05/23/96	05/30/96	06/06/96	06/14/96	07/02/96	07/20/96
Sustâne 5-2-4 + Fe	4.7 c	4.7 c	4.8 b	4.7 bc	4.5 bc	4.0 b	3.9 bc
<b>Sustâne 4-6-4 NO</b>	<b>6.9 a</b>	<b>6.6 a</b>	<b>6.7 a</b>	<b>6.4 a</b>	<b>6.1 a</b>	<b>5.9 a</b>	<b>5.8 a</b>
Sustâne 12-2-8	4.75 c	4.6 c	4.8 b	4.3 c	4.1 c	4.3 b	4.2 b
19-27-10 inorganic	5.4 b	5.25 b	5.0 b	4.9 b	4.7 b	4.3 b	4.2 b

LSD<sub>0.05</sub> =      0.45      0.51      0.52      0.56      0.48      0.48      0.57

Mean turfgrass quality rating for Kentucky bluegrass and four fertilizer treatments

Date	05/23/96	05/30/96	06/06/96	06/14/96	07/02/96	07/20/96
Sustâne 5-2-4 + Fe	4.25 b	4.1 c	3.92 b	3.8 b	3.2 b	3.1 b
<b>Sustâne 4-6-4 NO</b>	<b>5.6 a</b>	<b>5.75 a</b>	<b>5.42 a</b>	<b>5.58 a</b>	<b>5.1 a</b>	<b>5.5 a</b>
Sustâne 12-2-8	4.4 b	4.6 b	3.92 b	3.92 b	3.2 b	3.4 b
19-27-10 inorganic	4.4 b	3.92 c	3.25 c	3.25 c	3.0 b	3.0 b

LSD<sub>0.05</sub> =      0.38      0.51      0.52      0.43      0.60      0.53

Plant Density, Tall Fescue

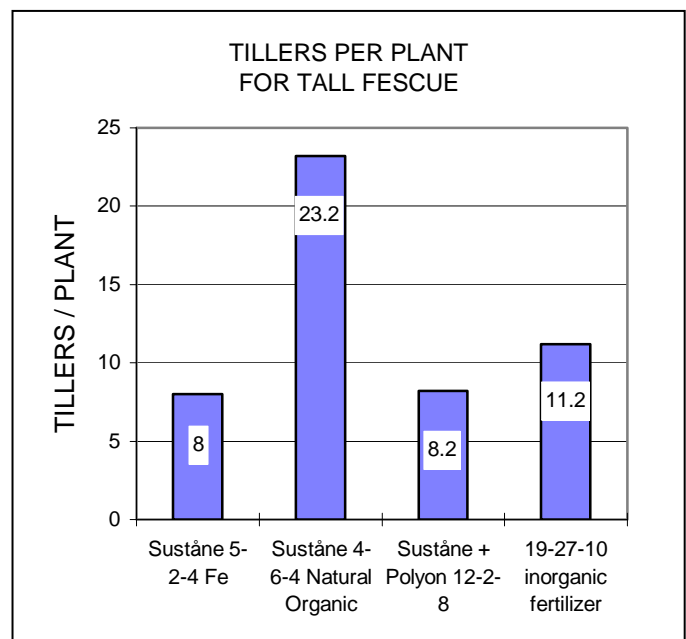
FERTILIZER TREATMENT	PLANTS Per sq. DECIMETER
Sustâne 5-2-4 Fe	14a
<b>Sustâne 4-6-4 All Natural</b>	<b>21a</b>
Sustâne 12-2-8 + Polyon	18a
19-27-10 inorganic fertilizer	20a

LSD<sub>0.05</sub> = 7.6 Mean number of plants per square decimeter for tall fescue and four fertilizer treatments.

Fertilizer Effect on Plant Tillering, Tall Fescue

FERTILIZER TREATMENT	TILLERS Per PLANT
Sustâne 5-2-4 Fe	8.0 b
<b>Sustâne 4-6-4 All Natural</b>	<b>23.2 a</b>
Sustâne 12-2-8 + Polyon	8.2 b
19-27-10 inorganic fertilizer	11.2 ab

LSD<sub>0.05</sub> = 8.2 Mean number of tillers per plant for tall fescue and four fertilizer treatments.



# TURFGRASS STARTER FERTILIZER EXPERIMENT

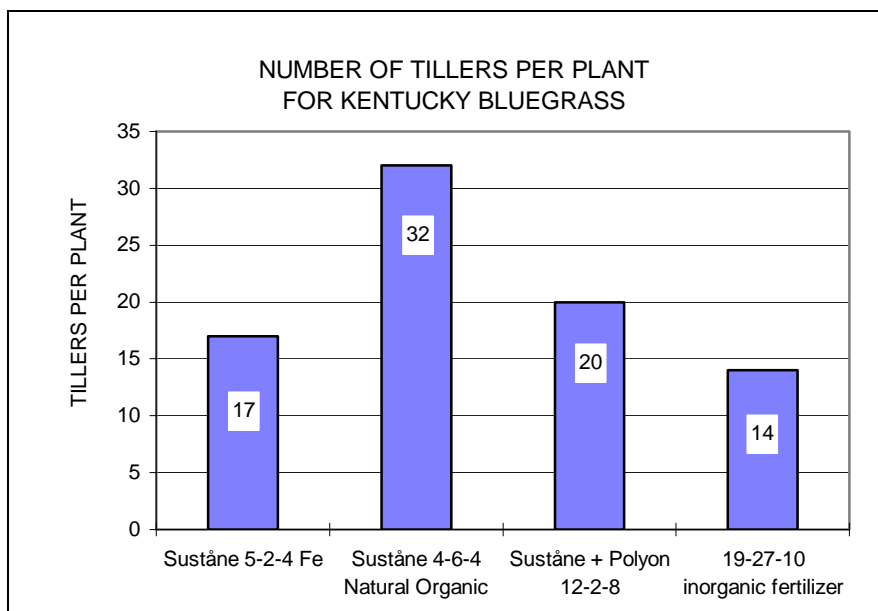
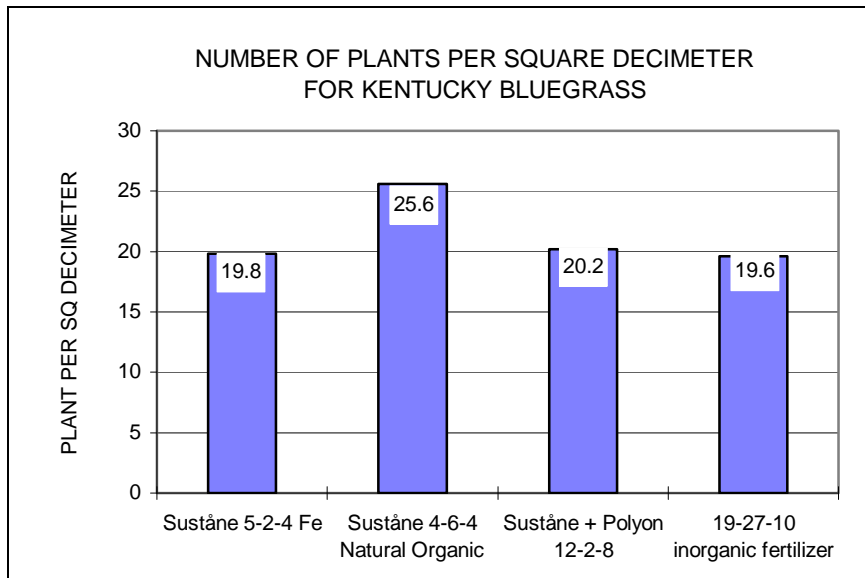
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Fertilizer Effect on Plant Density and on Plant Tillering, Kentucky bluegrass

FERTILIZER TREATMENT	PLANTS Per Sq. DECIMETER	TILLERS Per PLANT
Sustâne 5-2-4 Fe	19.8 a	17 b
Sustâne 4-6-4 Natural Organic	25.6 a	32 a
Sustâne + Polyon 12-2-8	20.2 a	20 b
19-27-10 inorganic fertilizer	19.6 a	14 b

LSD<sub>0.05</sub> = 8.4 Mean number of plants per square decimeter for K. bluegrass on 4 fertilizer treatments.

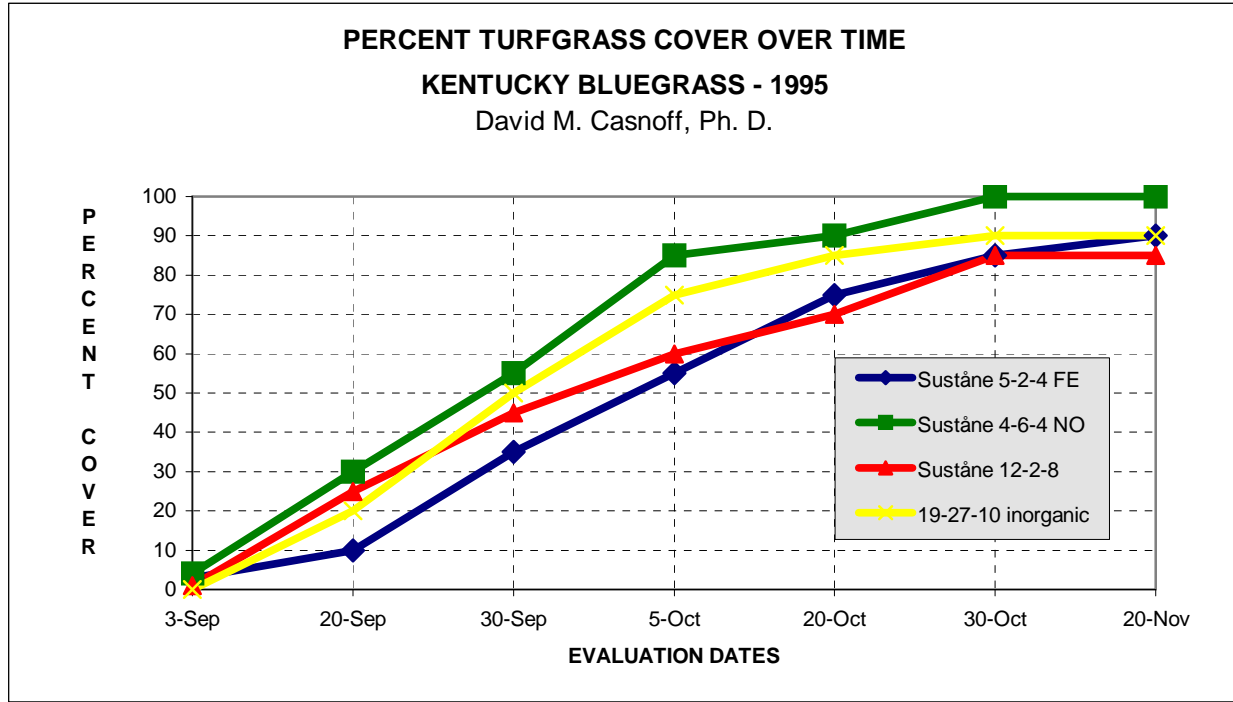
LSD<sub>0.05</sub> = 10.0 Mean number of tillers per plant for Kentucky bluegrass on 4 fertilizer treatments.



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Seeded September 3, 1995



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