

# A complete philosophy of turfgrass nutrition

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Asian Turfgrass Center

[www.asianturfgrass.com](http://www.asianturfgrass.com)

PACE Turf

[www.paceturf.org](http://www.paceturf.org)

*“Fertilizer is the number one management tool. It is worth all the attention you can give it.”*

John Madison, *Principles of Turfgrass Culture* (1971), p. 270

# Everything you need to know about turfgrass nutrition in 1 lecture

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[seminar.asianturfgrass.com/2014\\_osu.html](http://seminar.asianturfgrass.com/2014_osu.html)

10 October 2014

HORT 314: Principles of Turfgrass Maintenance

Oregon State University

# The 1 minute version

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- Apply the right amount of nitrogen
- Ensure soil pH is more than 5.5 and less than 8.3
- Ensure soil potassium is above 37 ppm (Mehlich 3)
- Ensure soil phosphorus is above 21 ppm (Mehlich 3)

# 1. Slow-growing grass

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Old Course, St. Andrews



Augusta National GC

*“The fundamental principle of successful greenkeeping is the recognition of the fact that the finest golfing grasses flourish on poor soil and that more harm is done by over-, rather than underfertilizing.”*

*Alister MacKenzie, Spirit of St. Andrews*

2. 100% of nutrients supplied as  
fertilizer

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Below you will find the best handbooks written by researchers and experts for all who are responsible for a golf clubs maintenance, playing quality, biodiversity, multifunctionality and much more.

## Precision Fertilisation Handbook

The first (2011) edition of this handbook summarised the knowledge and experiences gained in three research projects on fertilisation funded by STERF in the period 2003-2011.

The current (2021) handbook has been updated with the results from the STERF projects *Optimal application of nitrogen and sulphur in autumn for better winter survival of turfgrasses* and *SUSPHOS: Sustainable phosphorus (P) fertilization on golf courses*. While former STERF projects mostly



focused on nitrogen (N), the aim of SUSPHOS was to investigate if P fertilization can be reduced on golf course putting greens without negative implications on turf quality.

[Precision Fertilisation Handbook 2021](#)

[Behovsanpassad gödsling 2021 \(S\)](#)

[Behovstillpasset gødskning – Fra teori till praksis \(D\)](#)

[Täsmälannoitus 2021 \(F\)](#)

[MARKVISS NÆRINGARGJÖF 2021 \(I\)](#)



## Sustainable water management

Water is essential to secure the future of the golf and turfgrass industry and the livelihoods of many rural communities that depend upon it.

This manual will provide you with a sound understanding and basis for improving your irrigation management practices in order to produce high quality turf with reduced environmental and economic cost.

[Irrigation of turf on golf courses](#)

[Vanning av gräs på golfbanor \(N\)](#)

[Vanding af græs på golfbaner \(D\)](#)

[Bevattning av gräs på golfbanor \(S\)](#)

[Golfkentän kastelu \(F\)](#)



## Winter Stress Management

This Golf course managers' handbook summarize results and experiences from research projects related to turf grass. Producing this text was included in N Federations' innovation project "Auto of fertilizer", which was concluded in figures show data from these experin to keep the text short the experiment in appendix I.

[Turfgrass Winter stress Mgmt](#)

[Skötsel av gröntgräs mot vinterskador \(S\)](#)

## Velvet bentgrass

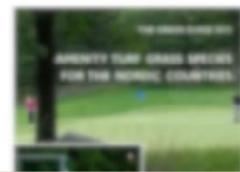
Why is the use of velvet bentgrass so limited?

There are several reasons for that, the most important probably being little experience and



## Red Fescue Management

A Handbook based on results from the research project "FESCUE-GREEN: Best management of red fescue (*Festuca rubra*) golf greens for high sustainability and playability".



## The Grass Guide & Seed

The "Grass Guide 2015" presents results of amenity turf for the Nordic countries past 30 years. It focuses on recommending grass-covered slopes, lawns, and

# Supply in this proportion:

N 100

K 65

P 14

S 9

Ca 7

Mg 6

What if the soil already has plenty of nutrients?





3. 100% of nutrients supplied by soil + fertilizer

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MLSN er en forkortelse for **MINIMUM LEVELS FOR SUSTAINABLE NUTRITION** på dansk: Minimumsniveau for bæredygtig gødskning.

MLSN er en moderne metode til at beregne anbefalet gødningsmængde ud fra jordprøver.

# Potassium (K)

mg/kg

150

100

50

0

2012-12-12

2014-01-28

2015-02-11

2016-01-28

2017-01-25

2018-01-29

2019-02-07

2020-02-14

2021-02-10

2022-01-29

68

40

40

38

60

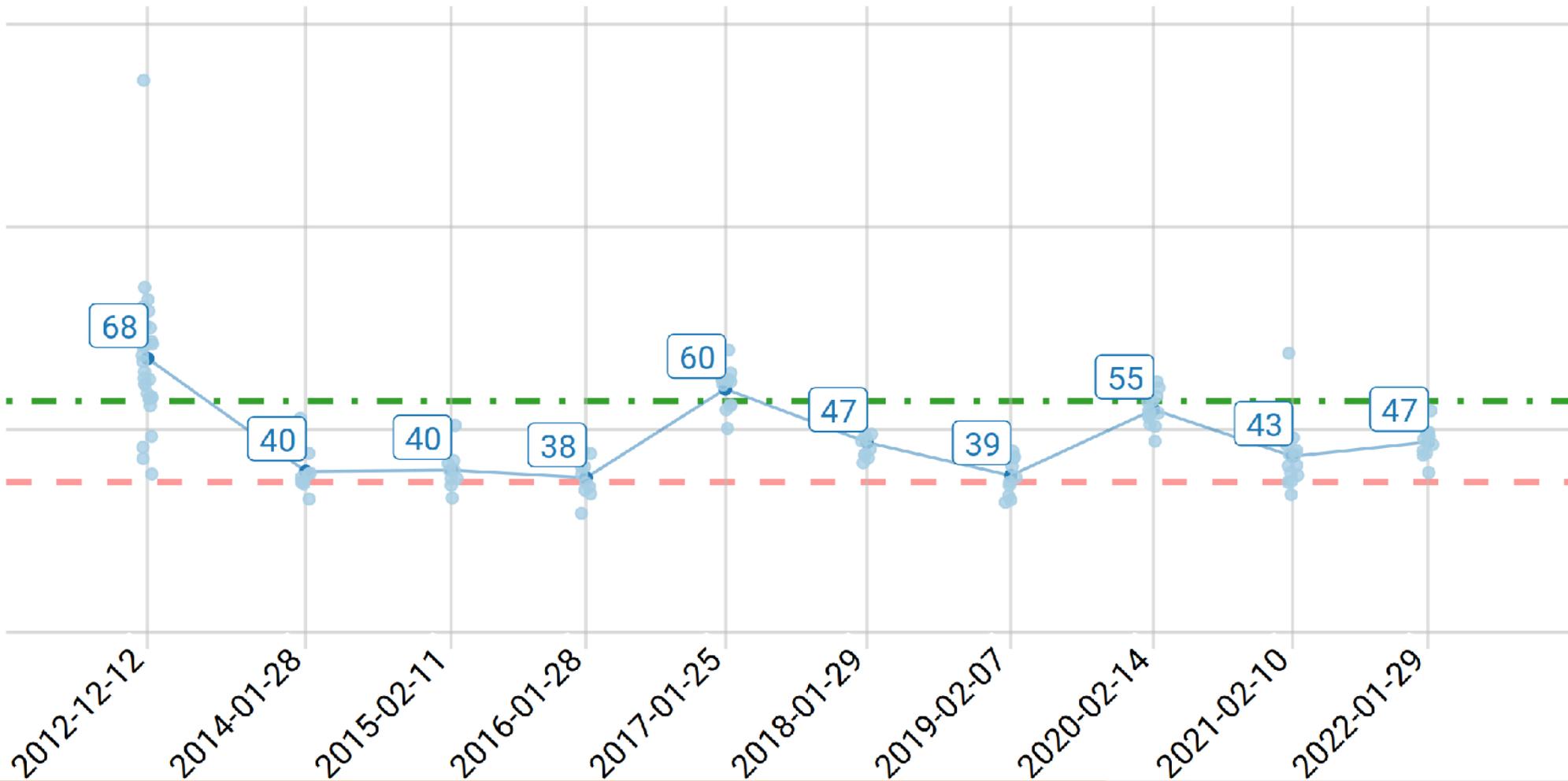
47

39

55

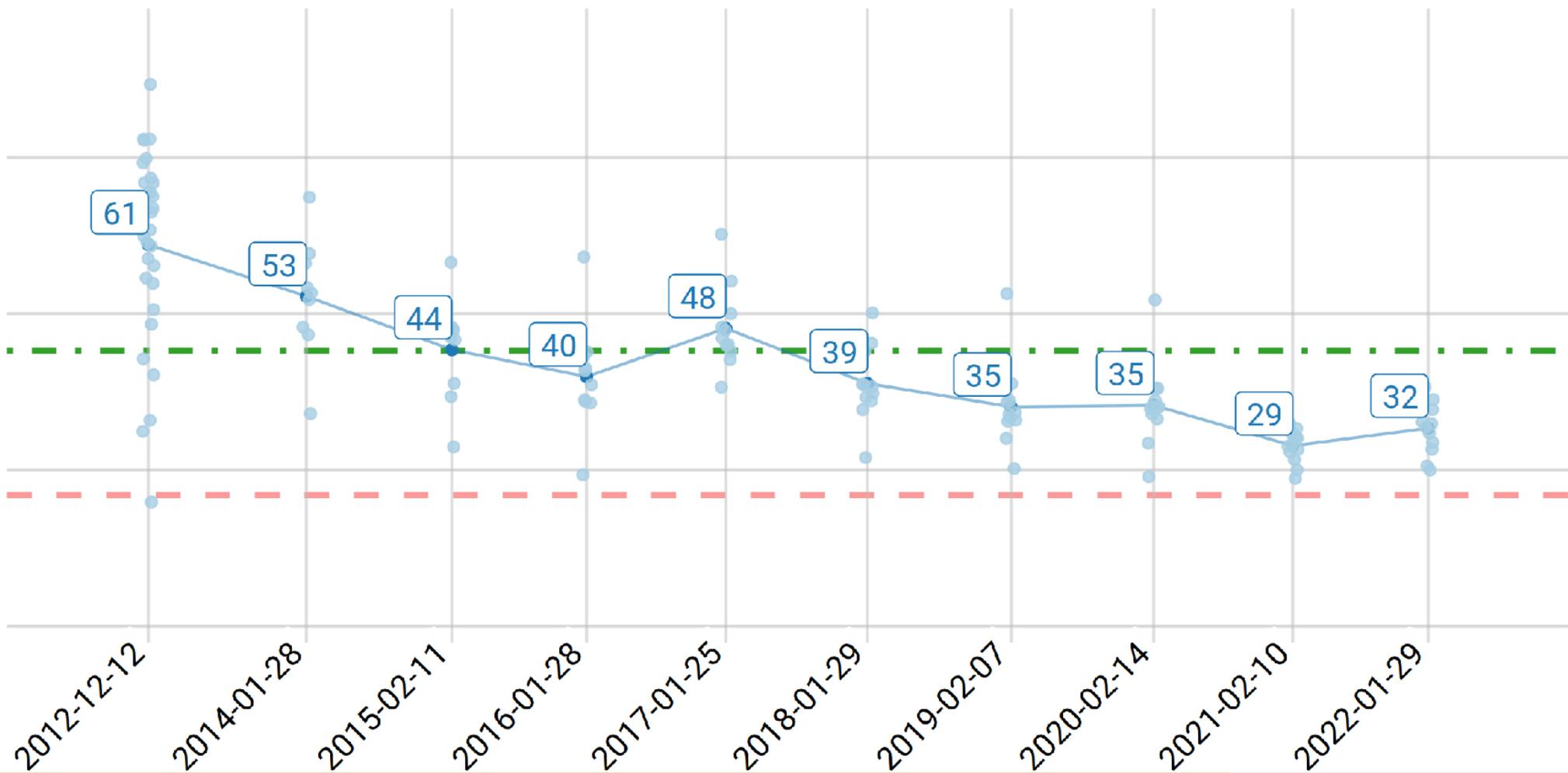
43

47



# Phosphorus (P)

mg/kg

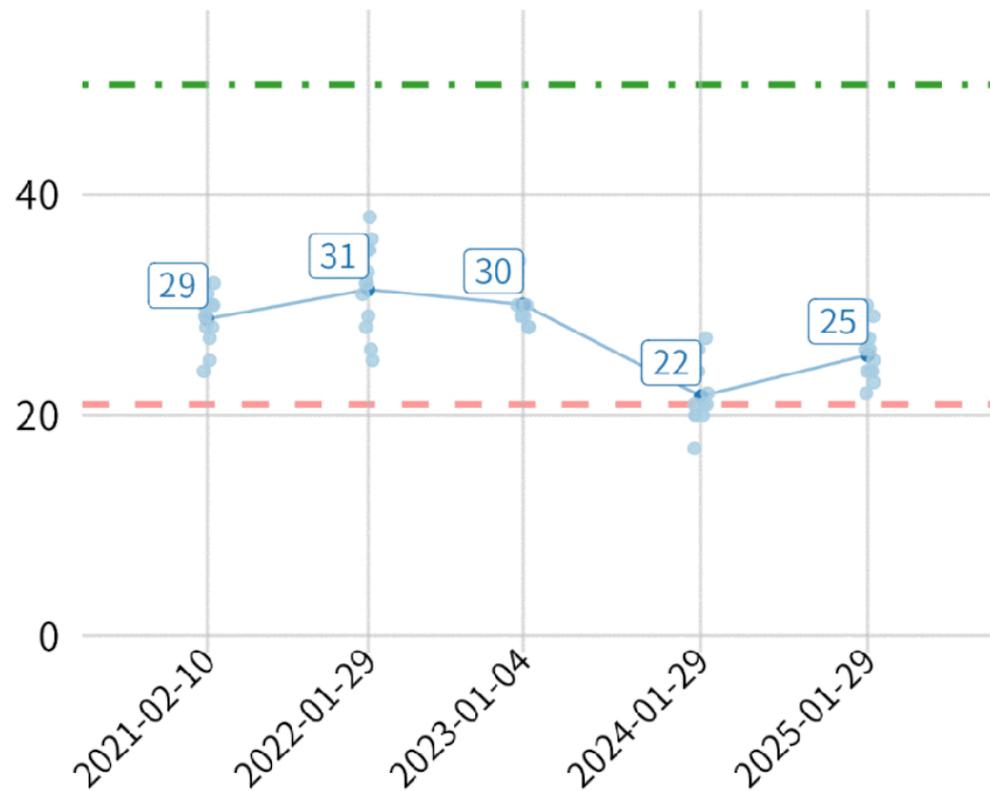


4. All that really needs adjusted  
is nitrogen (N)

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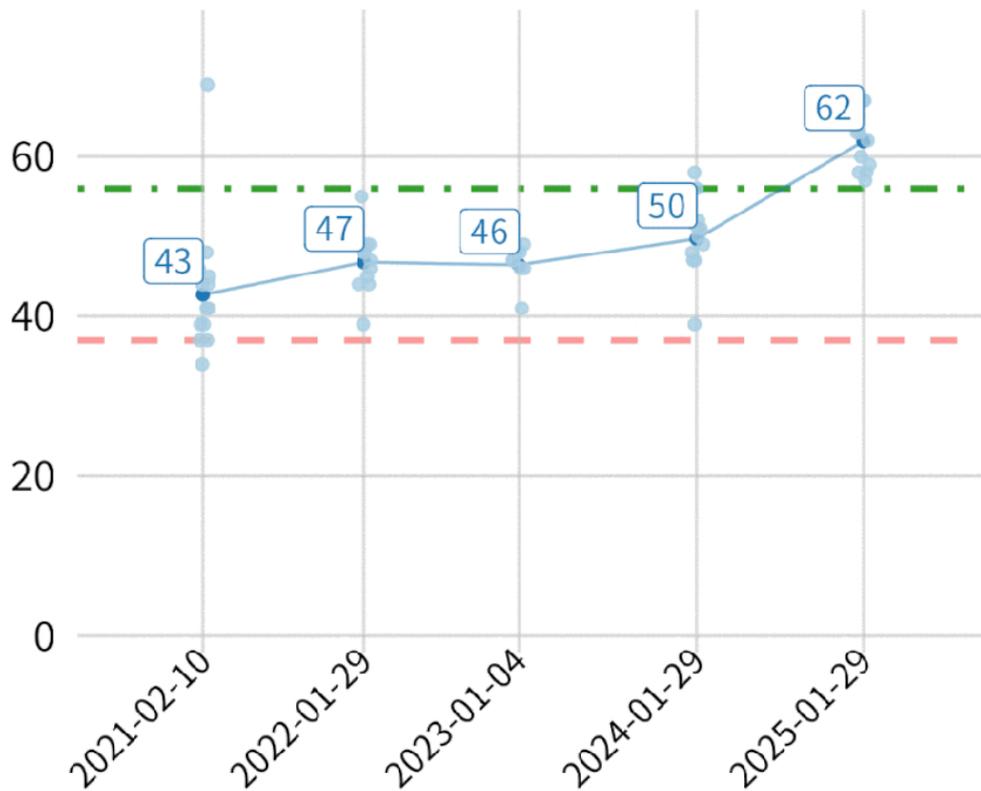
## リン (P)

mg/kg



## カリウム (K)

mg/kg



1. Slow-growing grass
2. 100% of nutrients supplied as fertilizer
3. 100% of nutrients supplied by soil + fertilizer
4. All that really needs adjusted is nitrogen (N)



DAD IPA  
HATCHING NEST BEER

SILLY SAISON  
HATCHING NEST BEER

SILLY SAISON  
HATCHING NEST BEER

Voll-Damm  
DORSE MALTA  
HATCHING NEST BEER

St. Bernardus Tripel  
HATCHING NEST BEER

BELIRIJSKA DOCTERIJUM  
HATCHING NEST BEER

EASY IPA  
HATCHING NEST BEER

STRAFFE HENDRIK  
HATCHING NEST BEER

Tripel Carmeliet  
HATCHING NEST BEER

STRAFFE HENDRIK  
HATCHING NEST BEER

VEDET IPA  
HATCHING NEST BEER

HATCHING NEST IPA  
HATCHING NEST BEER

STERLO Triple Blond  
HATCHING NEST BEER

HATCHING NEST IPA  
HATCHING NEST BEER

HATCHING NEST BEER  
HATCHING NEST BEER

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