

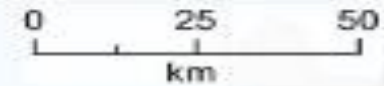


Agricon
„Täppisviljelus ja digilahendused taimekasvatuses“

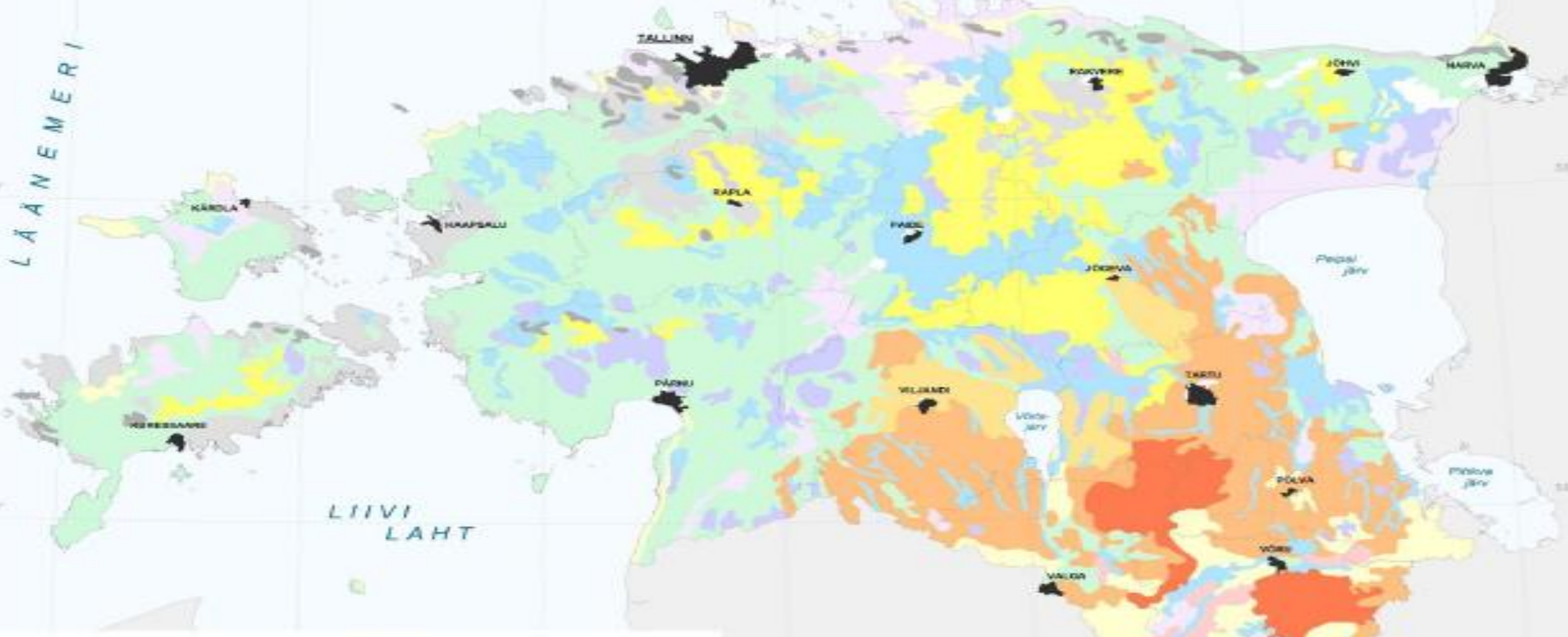
M.Sc.Agr. Meit Jürgens
AgriCon Estonia
EPKK 19.12.2022

MULLASTIK (põhimullad)

SOOME LAHT



LÄÄNEMERI

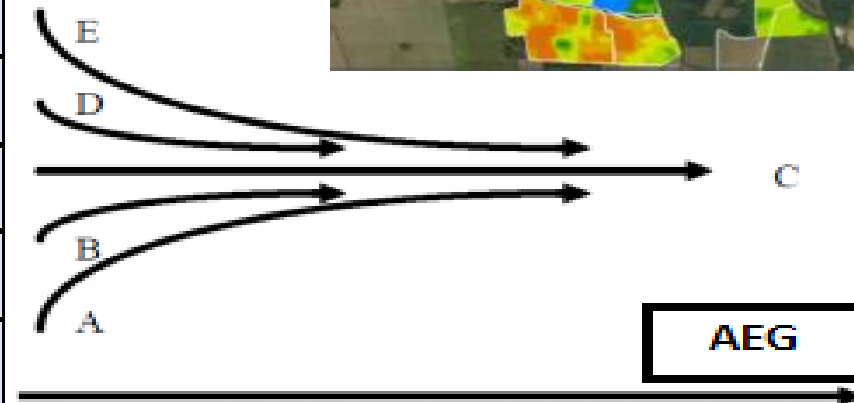


- | | |
|-----------------------------|---------------------------------|
| paepealsed mullad | leetunud ja leedemullad |
| rähkmullad | leet-gleimullad |
| leostunud mullad | gleimullad |
| leetjad mullad | madalsoomullad |
| heledad näivleetunud mullad | raba- ja siirdesoomullad |
| pruunid näivleetunud mullad | erodeeritud- ja deluviaalmullad |

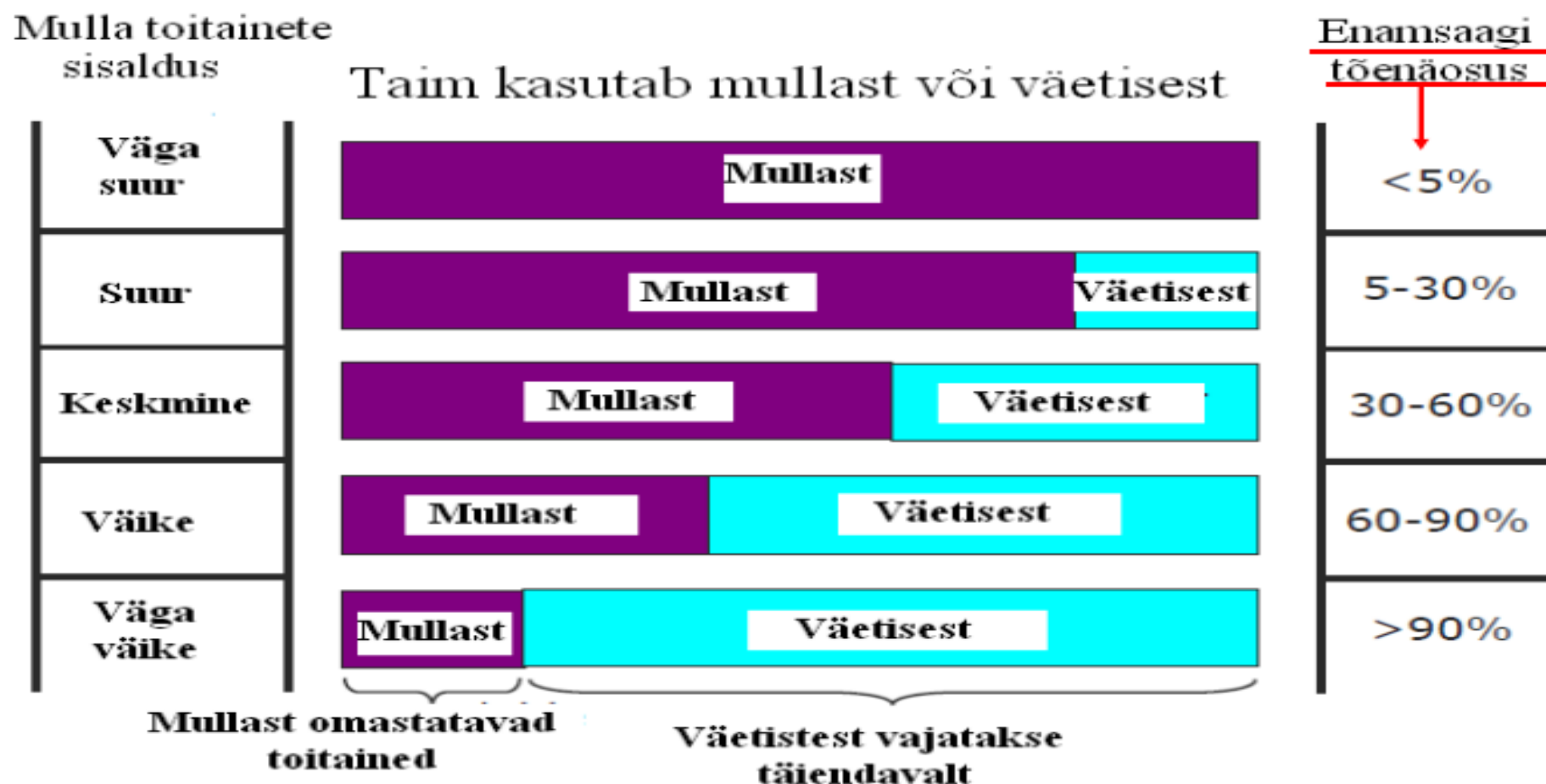
T. Kikas, P. Penu
I. Reesmaa, L. Reinart
Mullatüüpide arv. 11. 2012. lk. 154

(KERSCHBERGER et al. 1997).

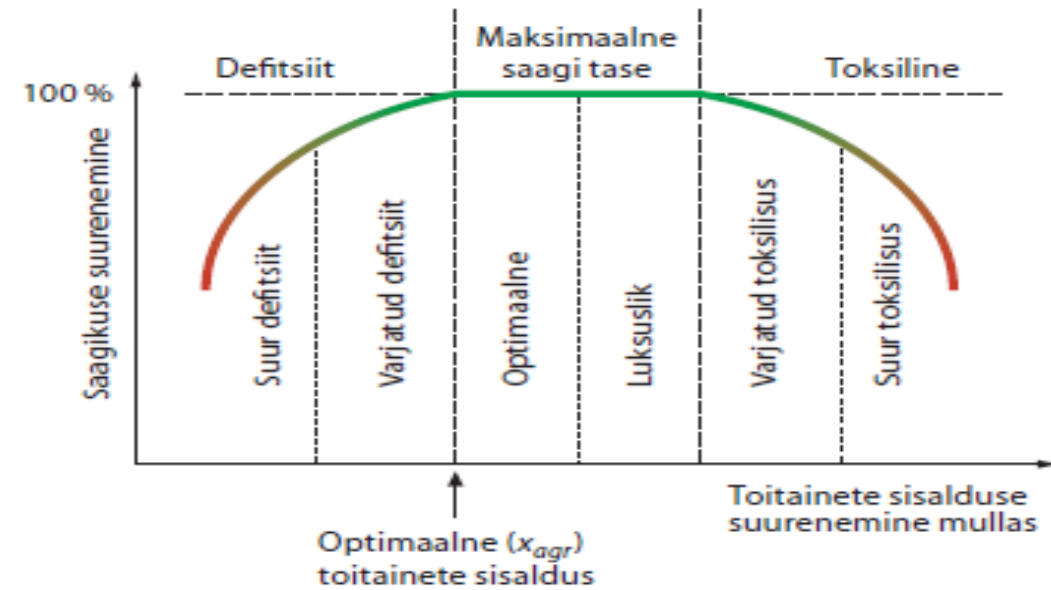
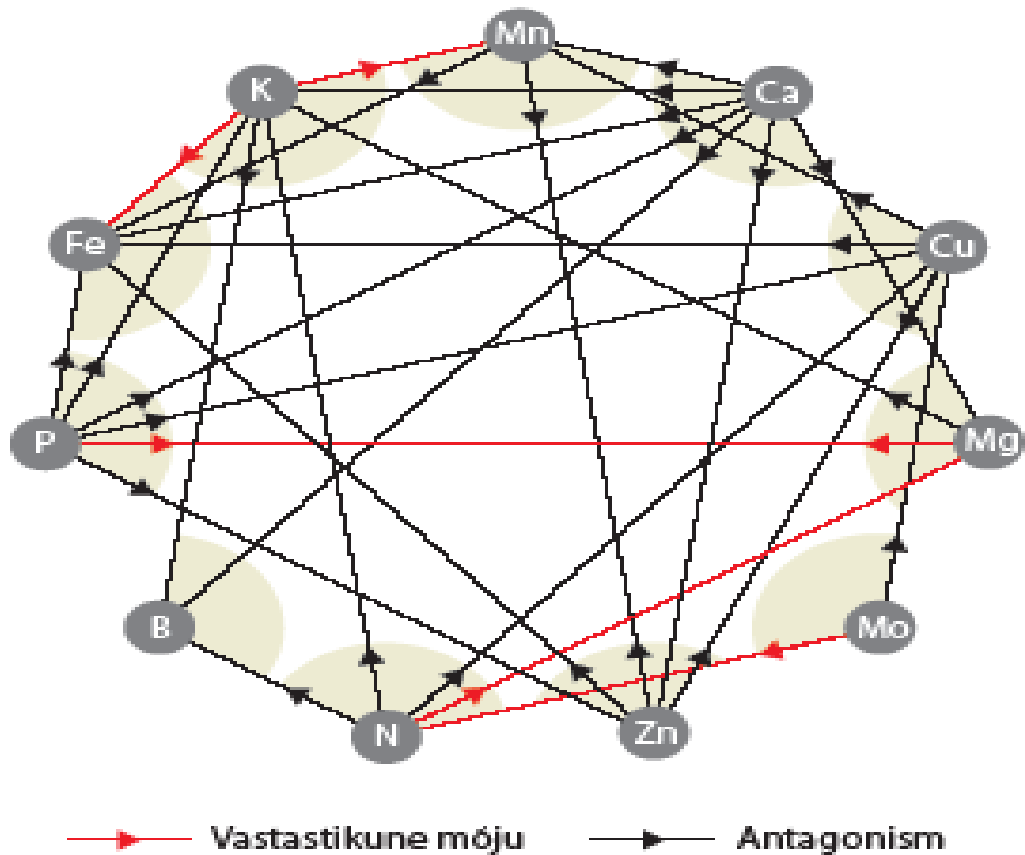
P - tasemed	Väetise vajadus
E	no fertilization
D	reduced fertilization
C	conservation fertilization
B	increased fertilization
A	strongly increased fertilization



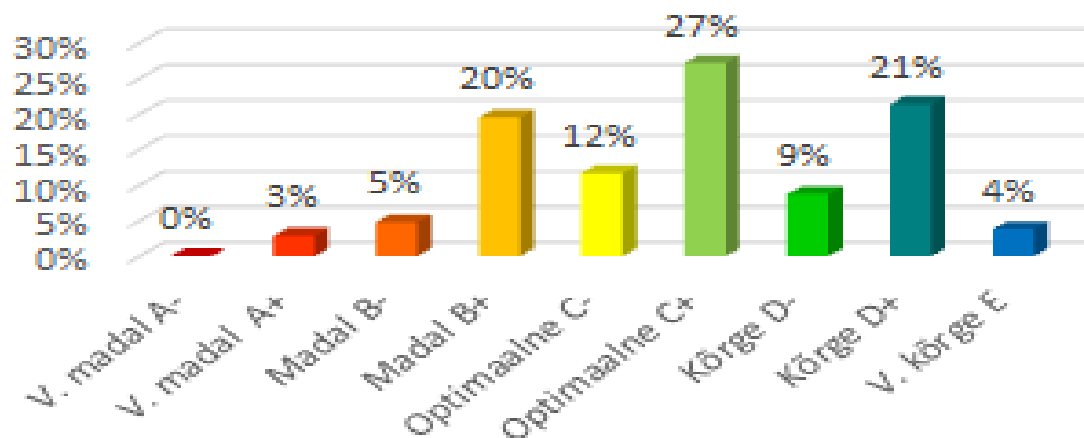
Saagi kujunemine sõltuvalt mulla väetistarbest



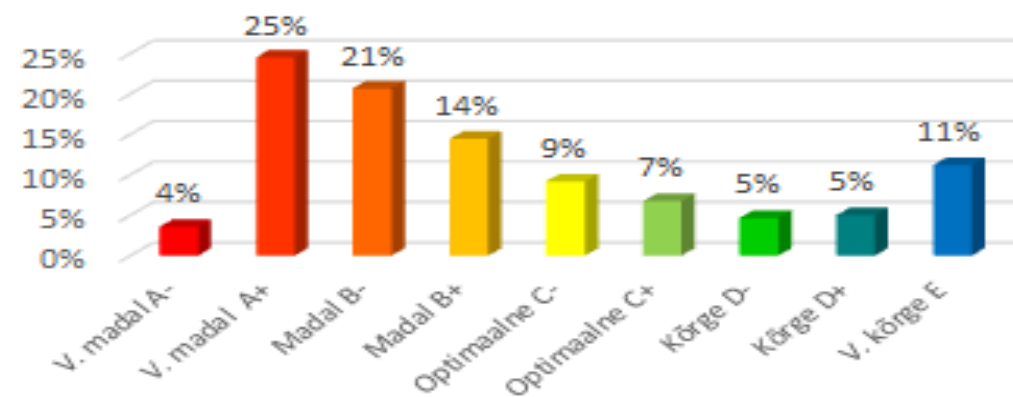
Vastastikune mõju ja antagonism



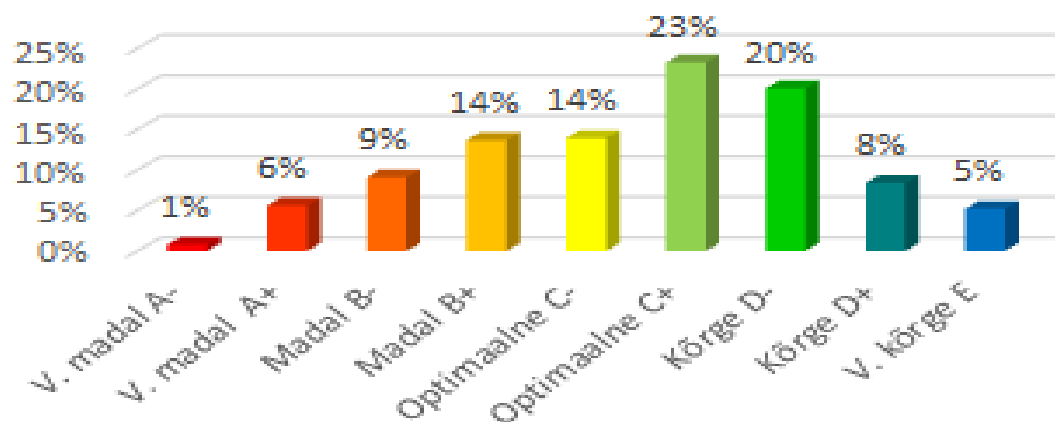
pH



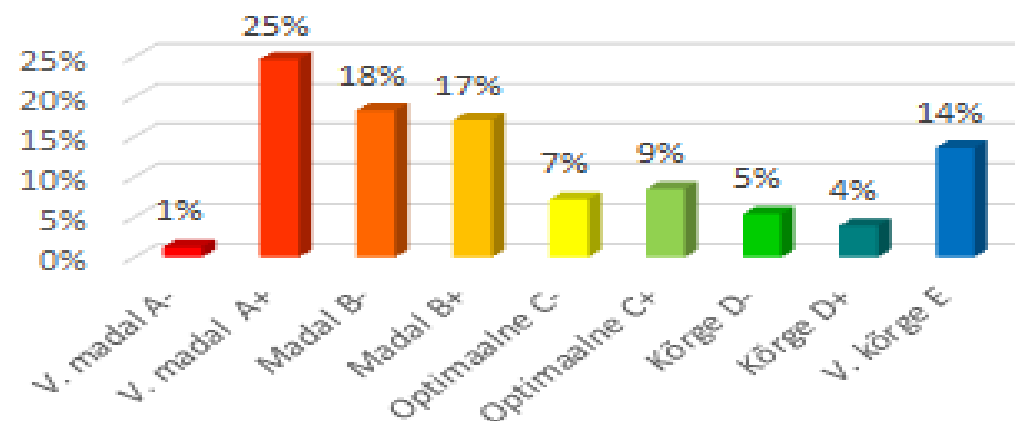
P



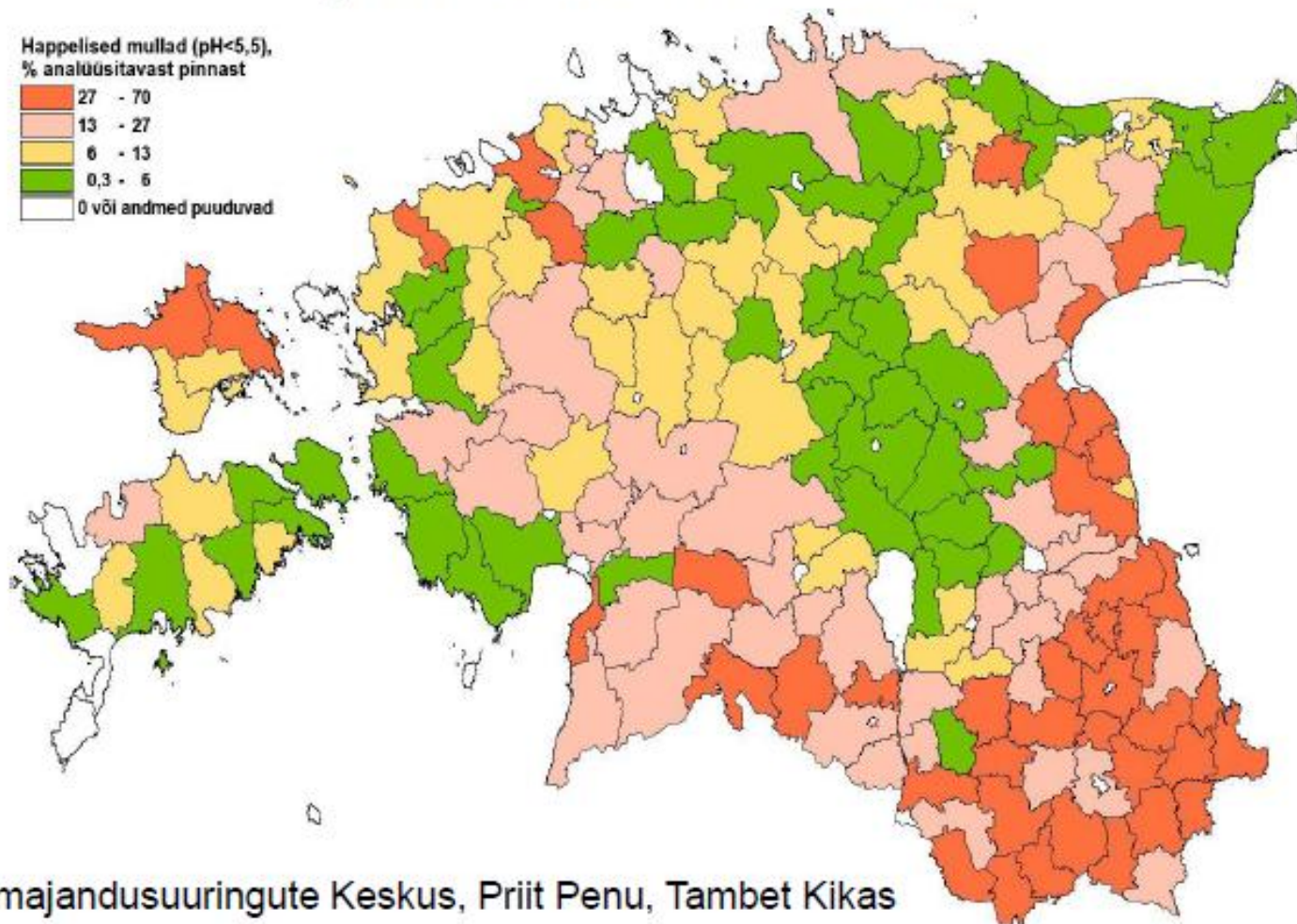
K



Mg



Happeliste muldade ($\text{pH}_{\text{KCl}} < 5,5$) osatähtsus (%) kogu analüüsitud pinnast valdade lõikes perioodil 2003-2012



Allikas: Põllumajandusuuringute Keskus, Priit Penu, Tambet Kikas

Tabel 14. Põllumuldade lubjatarve

Mullad	pH _{KCl} Hu/ C _{org} %	4,0	4,1	4,2	4,3	4,4	4,5	4,6	4,7	4,8	4,9	5,0	5,1	5,2	5,3	5,4	5,5	5,6	5,7	5,8	5,9	6,0*
		CaCO ₃ t/ha																				
Parasniisked (E2, E3, Lkl, LkII, LkIII, D, KI, Ko)	<2,1/ <1,20	6,4	6,3	6,2	6,0	5,8	5,7	5,5	5,3	5,2	5,0	4,8	4,7	4,5	4,3	4,2	4,0	3,8	3,7	3,5	3,3	3,2
	2,1-3,0/ 1,21-1,70	7,0	6,9	6,8	6,6	6,4	6,3	6,1	6,0	5,8	5,6	5,5	5,3	5,1	5,0	4,8	4,6	4,5	4,3	4,2	4,0	3,8
	3,1-5,0/ 1,71-2,90	8,3	8,1	8,0	7,8	7,6	7,5	7,3	7,2	7,0	6,9	6,7	6,6	6,4	6,2	6,1	5,9	5,8	5,6	5,5	5,3	5,1
Niisked (Klg, Kog, Lkg, Dg)	<2,1/ <1,20	7,9	7,8	7,5	7,2	6,8	6,5	6,2	5,9	5,6	5,2	4,9	4,6	4,3	4,0	3,7	3,3	3,0	2,7	2,4	2,1	1,7
	2,1-3,0 1,21-1,70	8,8	8,7	8,4	8,1	7,7	7,4	7,1	6,8	6,5	6,2	5,9	5,6	5,3	4,9	4,6	4,3	4,0	3,7	3,4	3,1	2,8
	3,1-4,0 1,71-2,30	9,9	9,7	9,4	9,1	8,8	8,5	8,2	7,9	7,6	7,2	6,9	6,7	6,3	6,0	5,7	5,6	5,1	4,8	4,5	4,2	3,9
	4,1-5,0 2,31-2,90	10,8	10,5	10,2	9,9	9,6	9,3	9,0	8,7	8,4	8,1	7,8	7,5	7,2	6,9	6,6	6,3	6,0	5,7	5,4	5,1	4,8
	5,1-6,0 1,91-3,50	11,4	11,3	11,0	10,7	10,5	10,2	9,9	9,6	9,3	9,0	8,7	8,4	8,2	7,7	7,6	7,3	7,0	6,7	6,4	6,1	5,9
Märjad (Go, GI, LG)	<3,1 <1,71	12,5	12,4	11,9	11,5	11,0	10,5	10,0	9,5	9,1	8,6	8,2	7,7	7,2	6,8	6,3	5,8	5,3	4,9	4,4	4,0	3,5
	3,1-9,0 1,72-5,25	12,5	12,4	12,0	11,6	11,2	10,7	10,3	9,9	9,5	9,1	8,6	8,2	7,8	7,4	7,0	6,5	6,1	5,7	5,3	4,9	4,5
Turvasmullad,	>9 >5,3	11,3	10,3	9,4	8,6	7,9	7,2	6,7	6,2	5,5	5,0	4,6	4,1	3,6	3,2	2,9	2,4	2,2	1,7	1,4	1,0	0,7



PROOV 1.

PROOV 2.

Proovi number

Väetise analüüsi tellimiseht



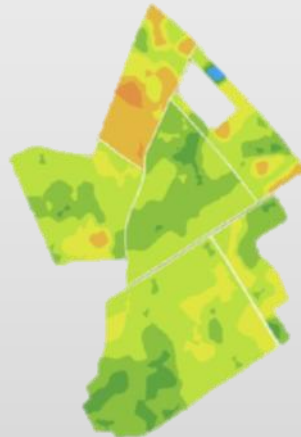
Mullaanalüüs - põhiväetamise alus



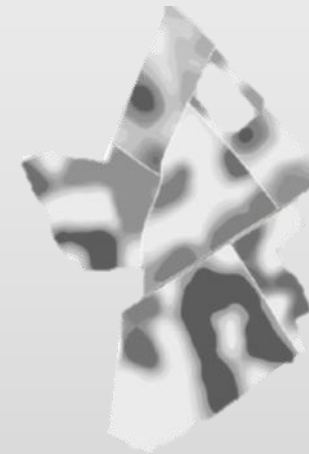
Põllu
skanneerimine
ja
proovivõtmine



Mulla
agrokeemilised
analüüsid



Põldude
asukohapõhine
väetamine



Agronoomilised
väetusplaanid

Informatsioon

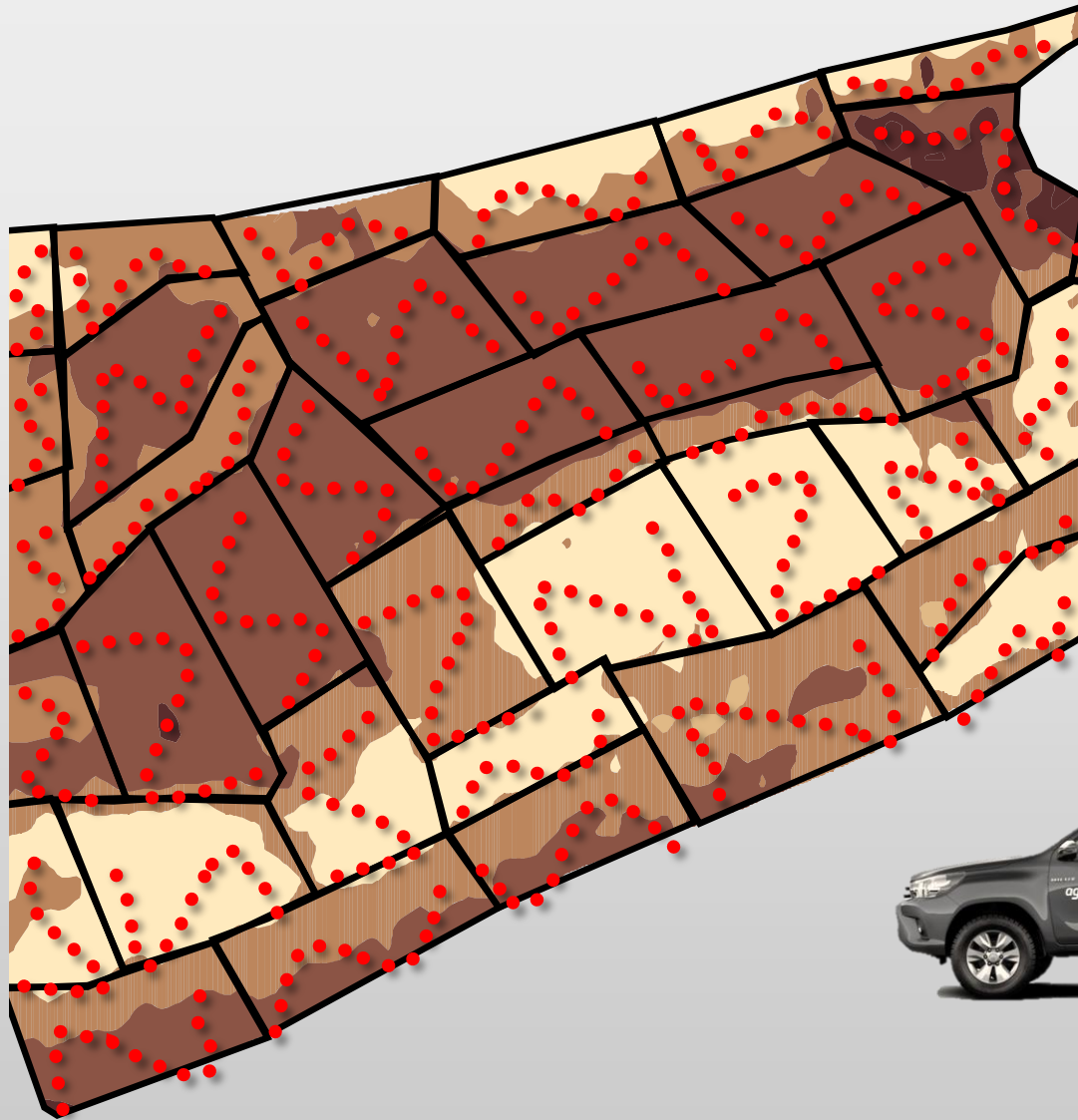
Agronoomilised
arvutused

Rakendamine



Digitāla laukkopība



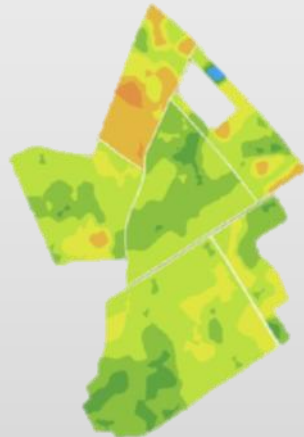


- Üks proov kogutakse (raster) 3, 2 või 1 ha. kohta
- Koosneb 12-20 torkest.

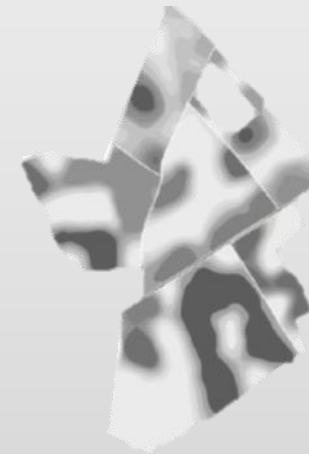
Põllu
skanneerimine
ja
proovivõtmine



Mulla
agrokeemilised
analüüsid



Põldude
asukohapõhine
väetamine

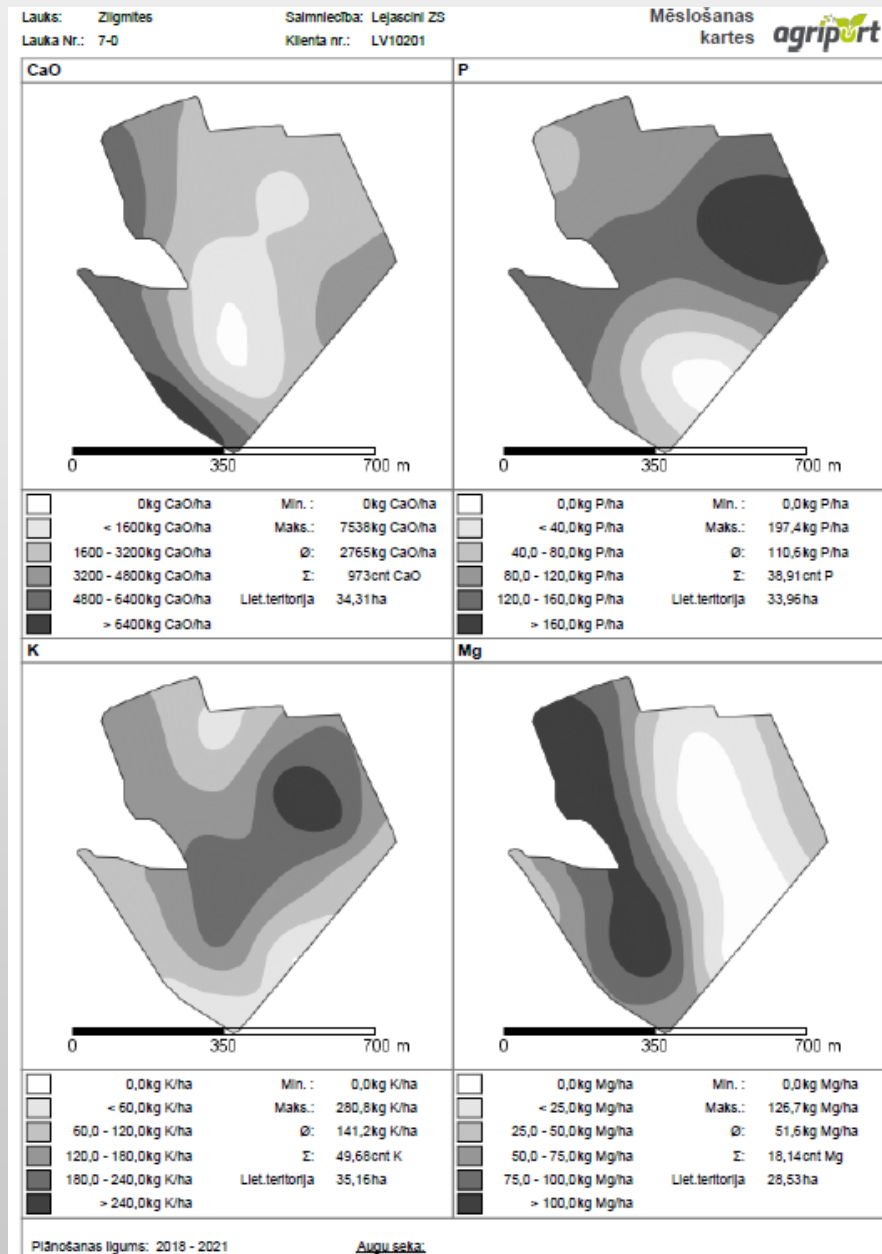
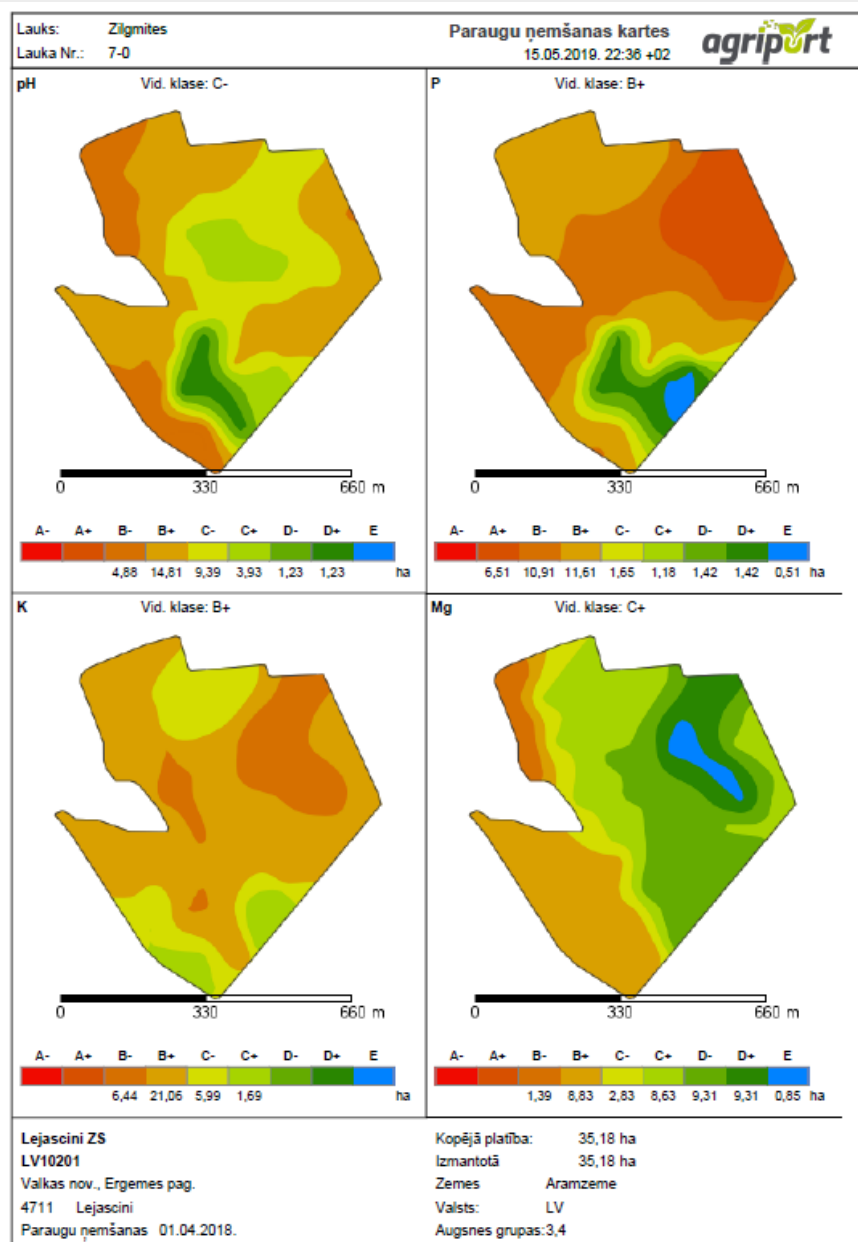


Agronoomilised
väetusplaanid

Informatsioon

Agronoomilised
arvutused

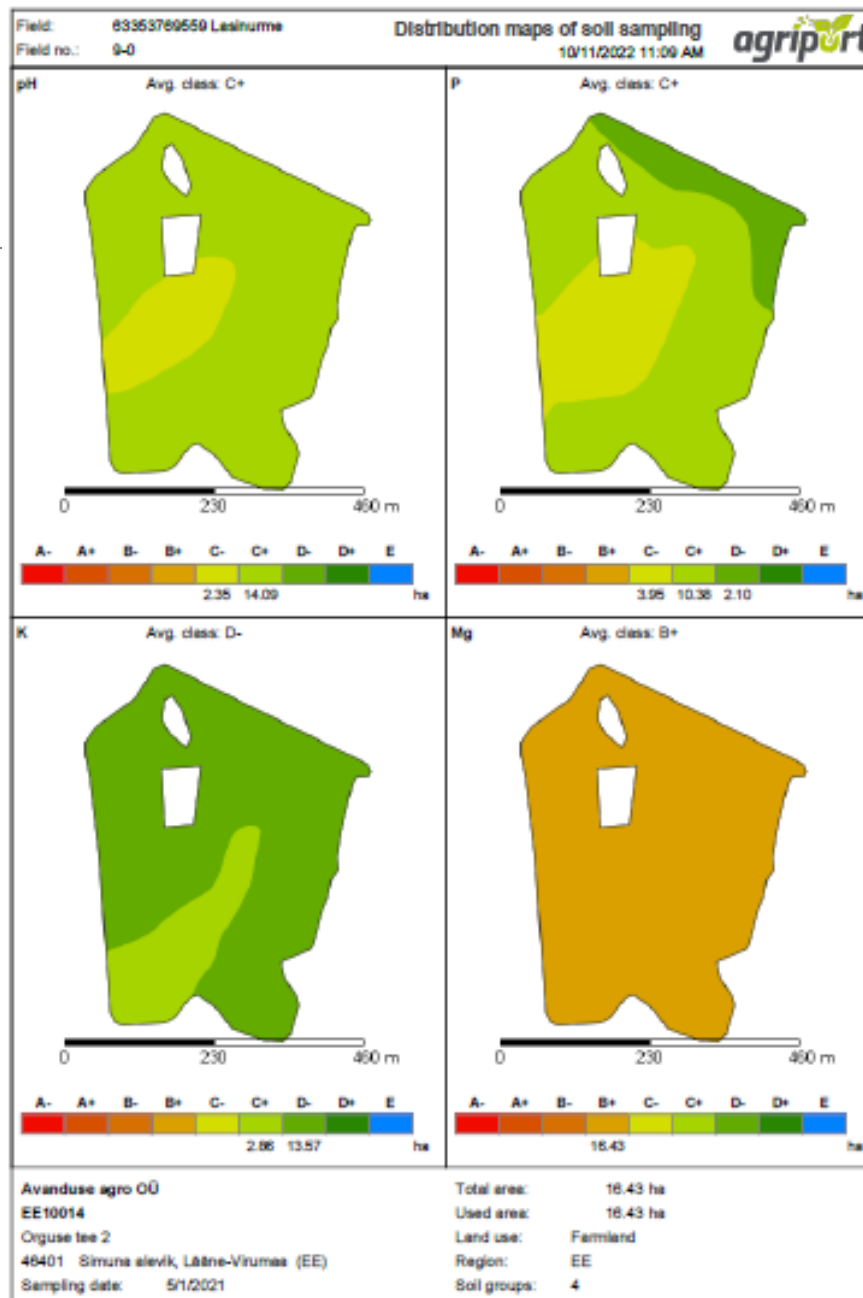
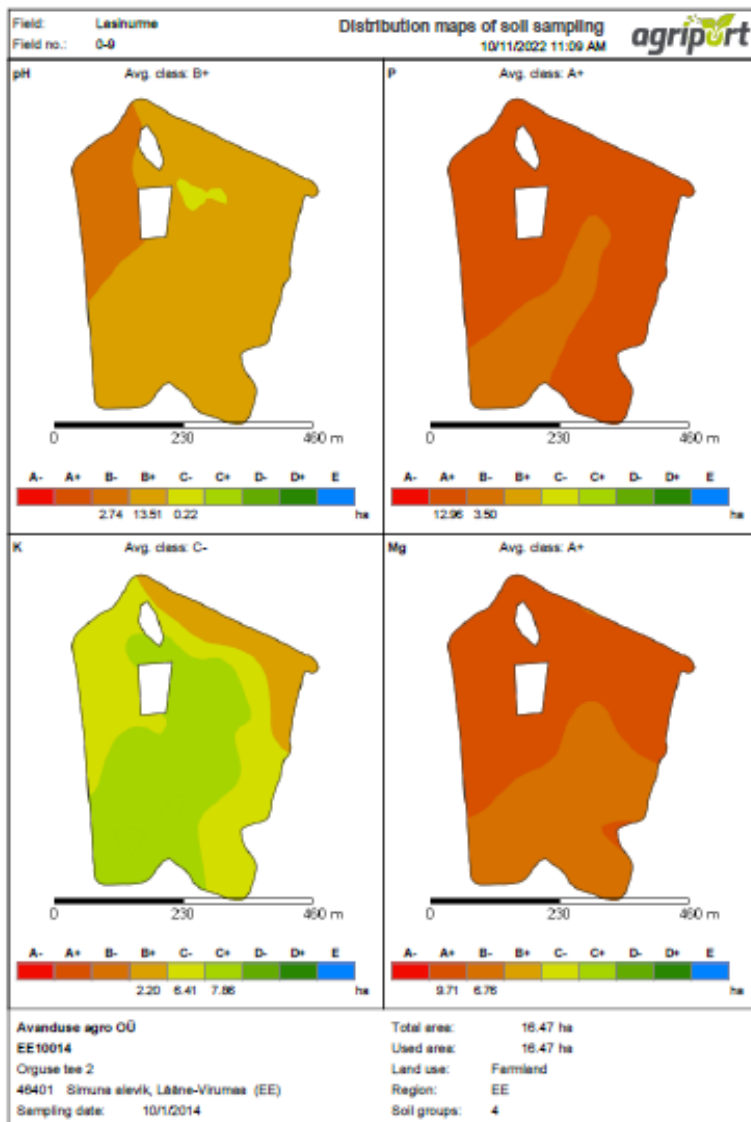
Rakendamine





Proovide kogumine

Avanduse agro OÜ





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Password

Please enter your password.

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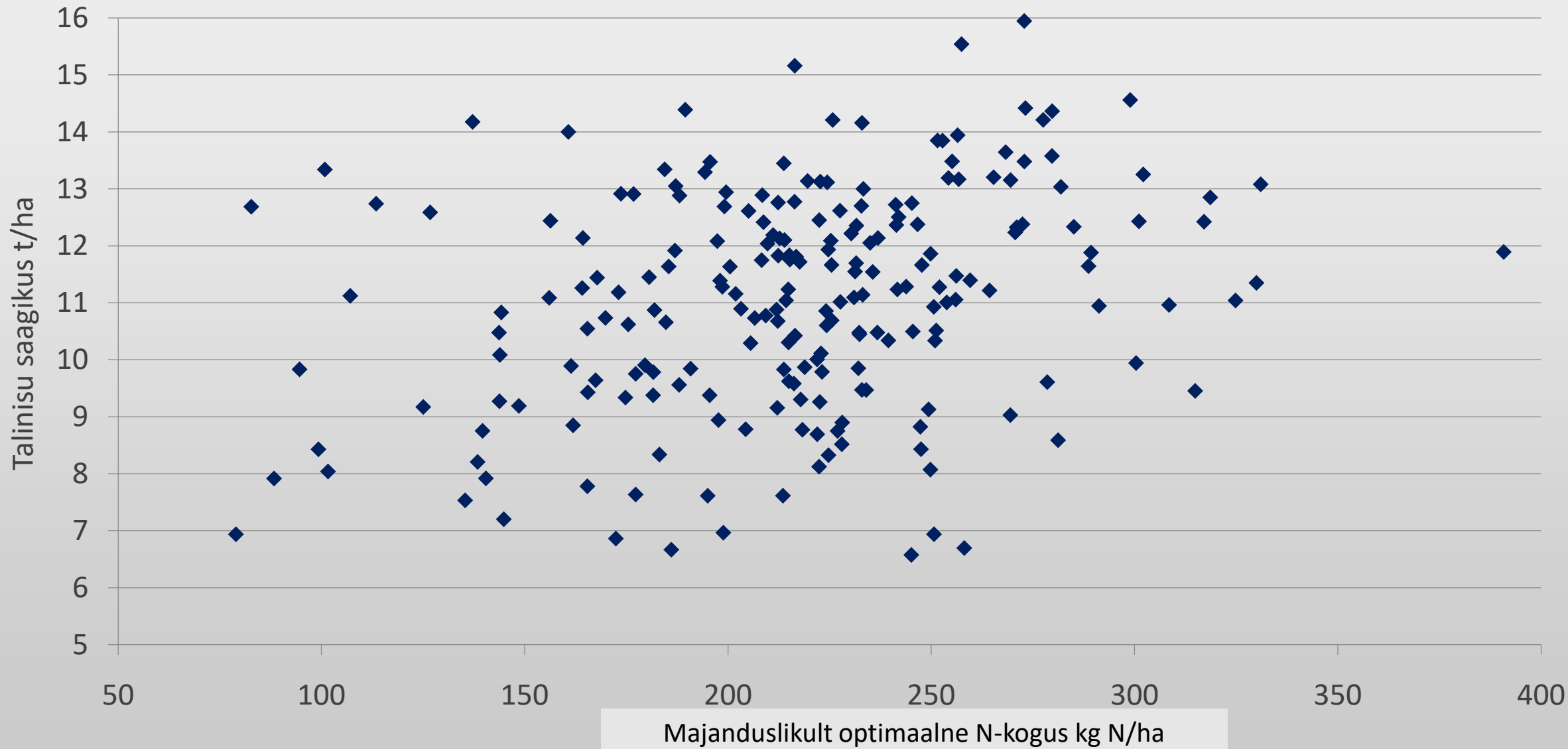
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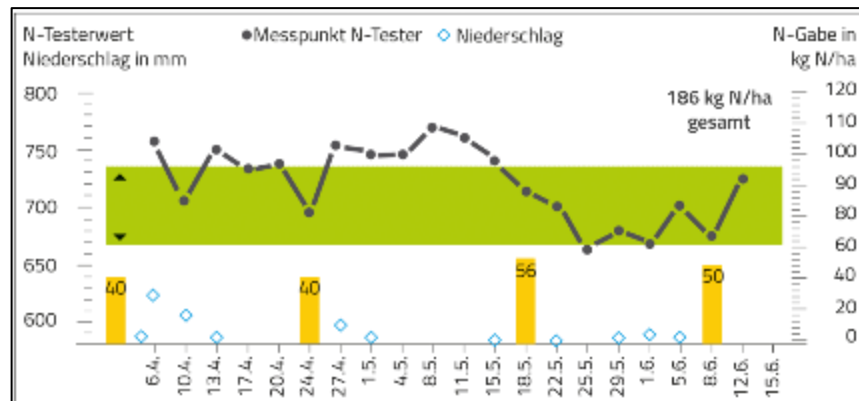
Allikas: Optimaalse N-normi korrelatsioon saagiga, 264 katset aastatel 1996–2014, Saksamaa

Terviklahendus N väetamiseks



Väetise vajadus

N-Tester



Väetamise aeg

N-Monitoring

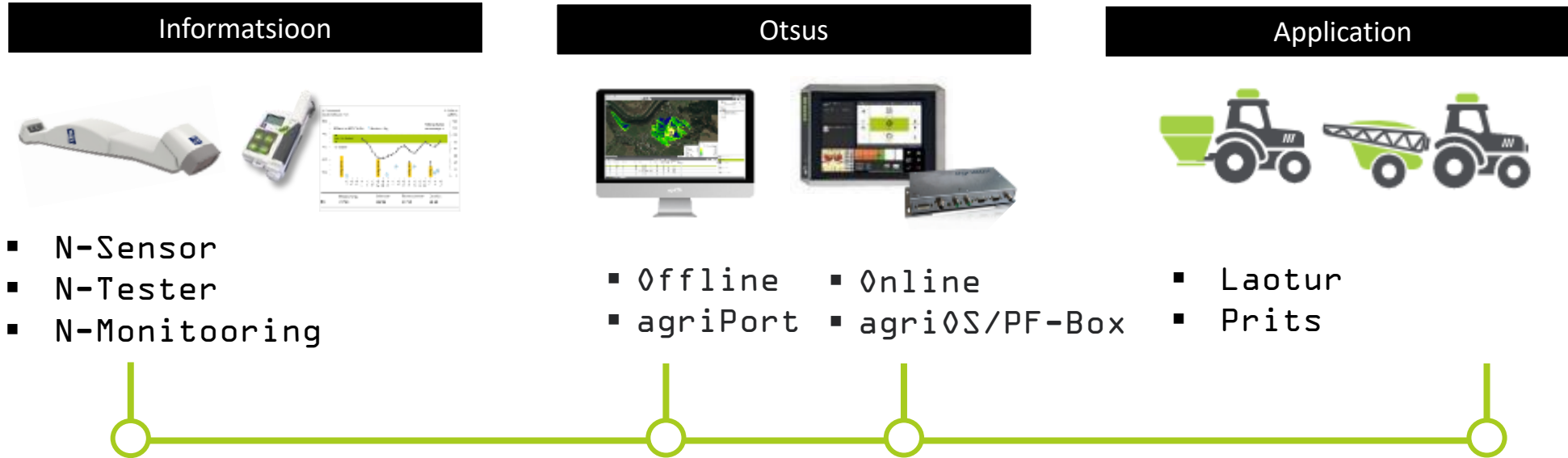


Varieeruv väetamine

N-Sensor

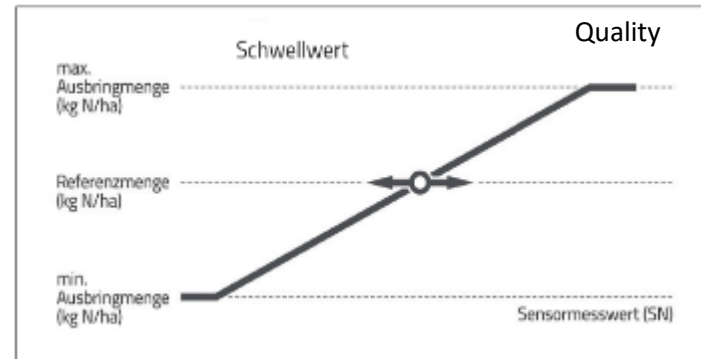
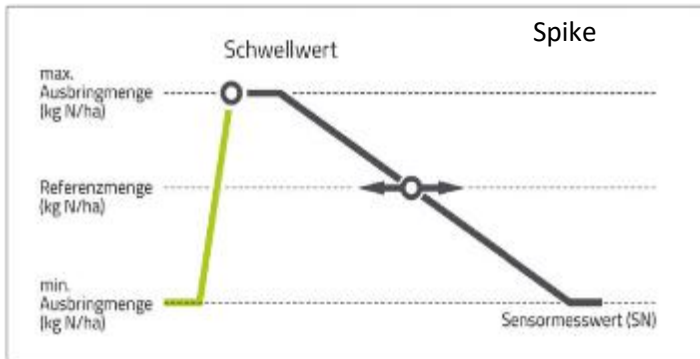
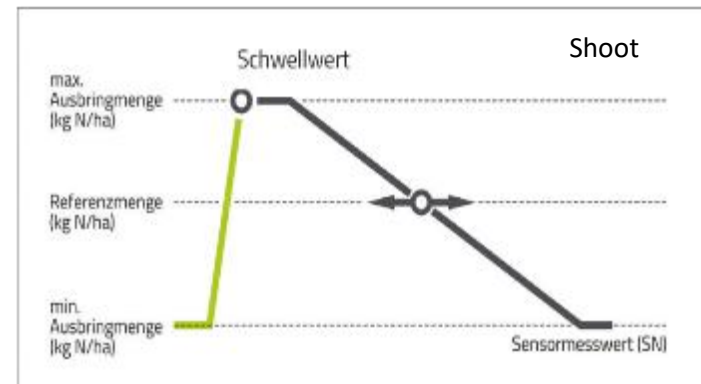
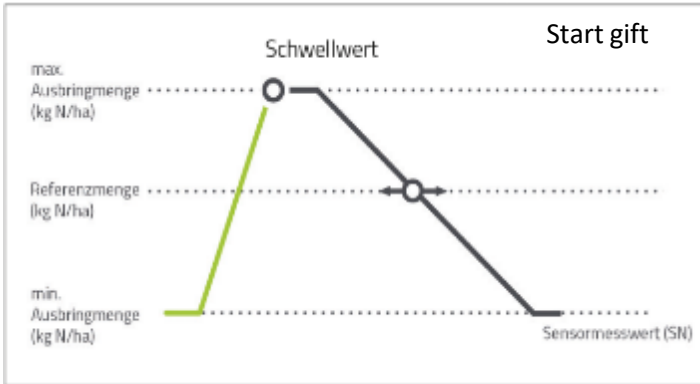
= Õige kogus – õige aeg – õige koht

Seadmed ja protsess

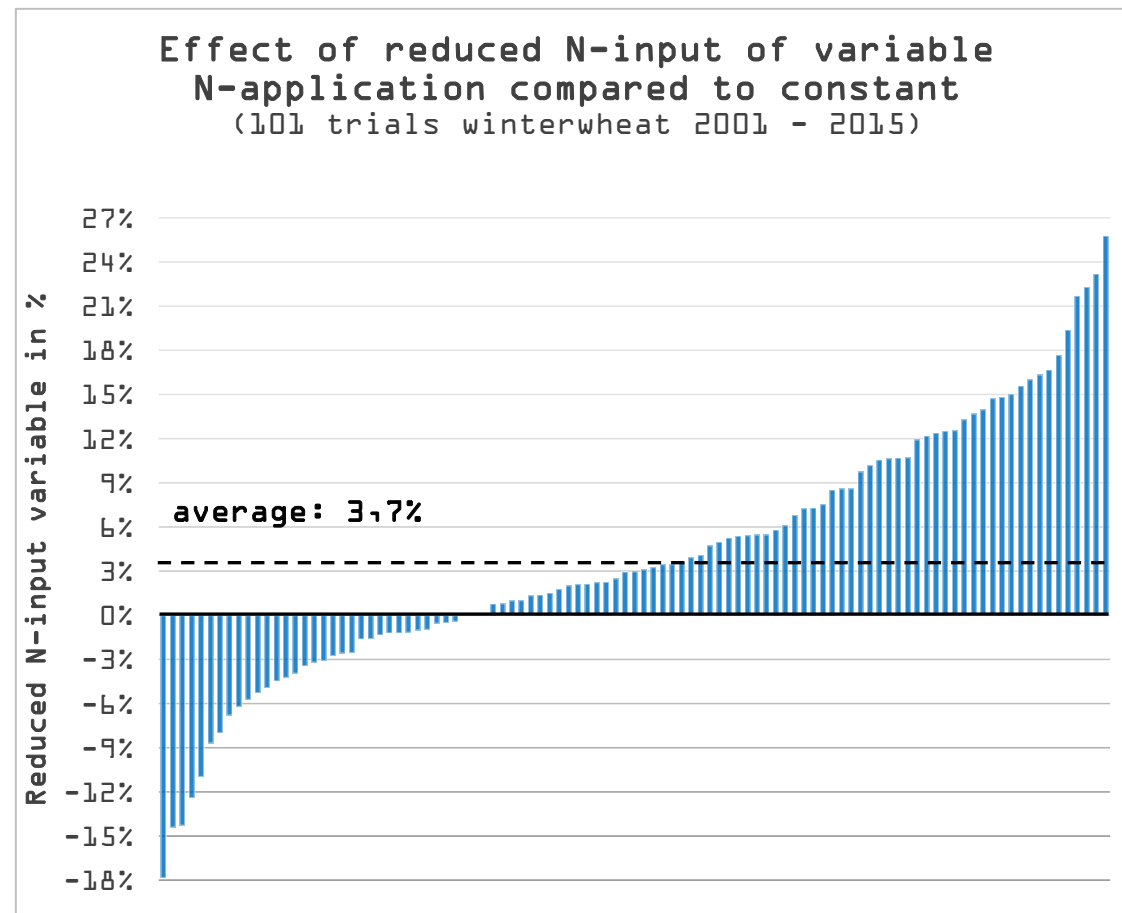
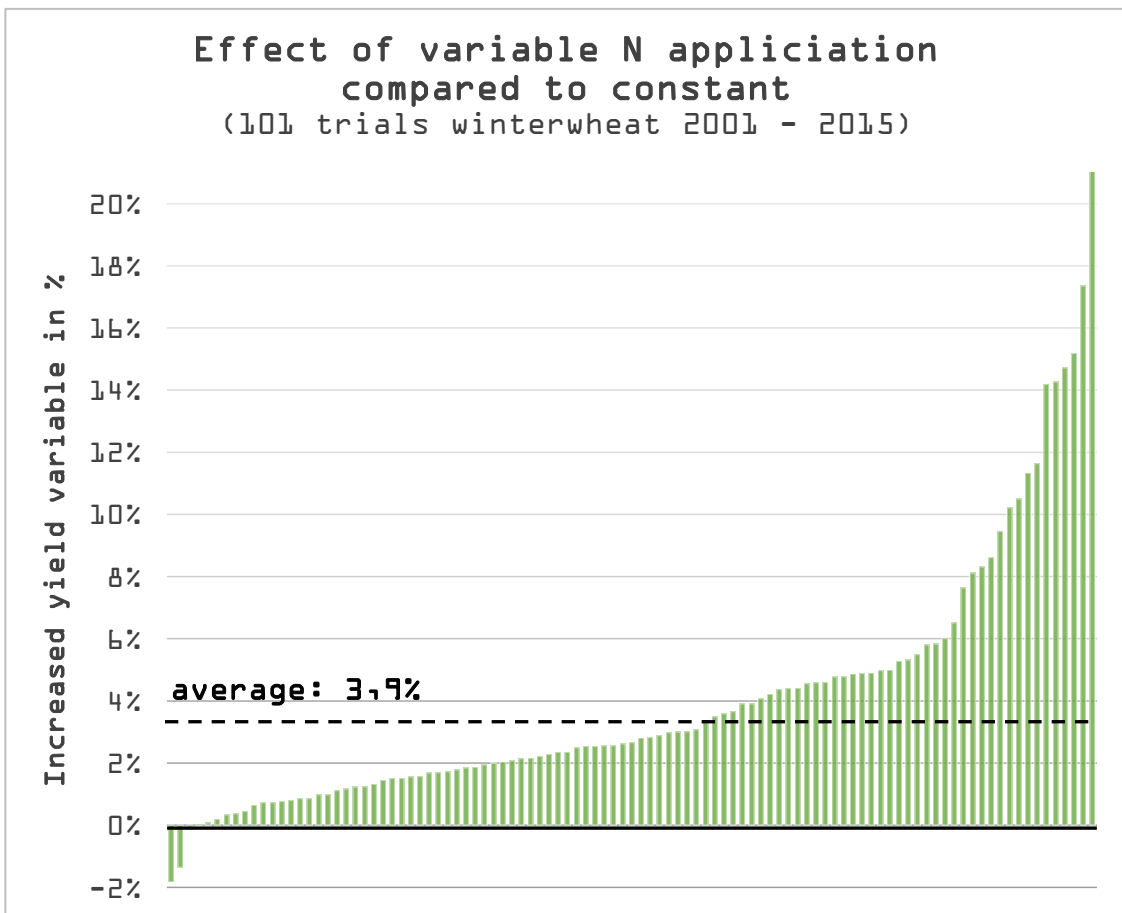


Optimaalne N-väetamine

Agronoomilised programmid

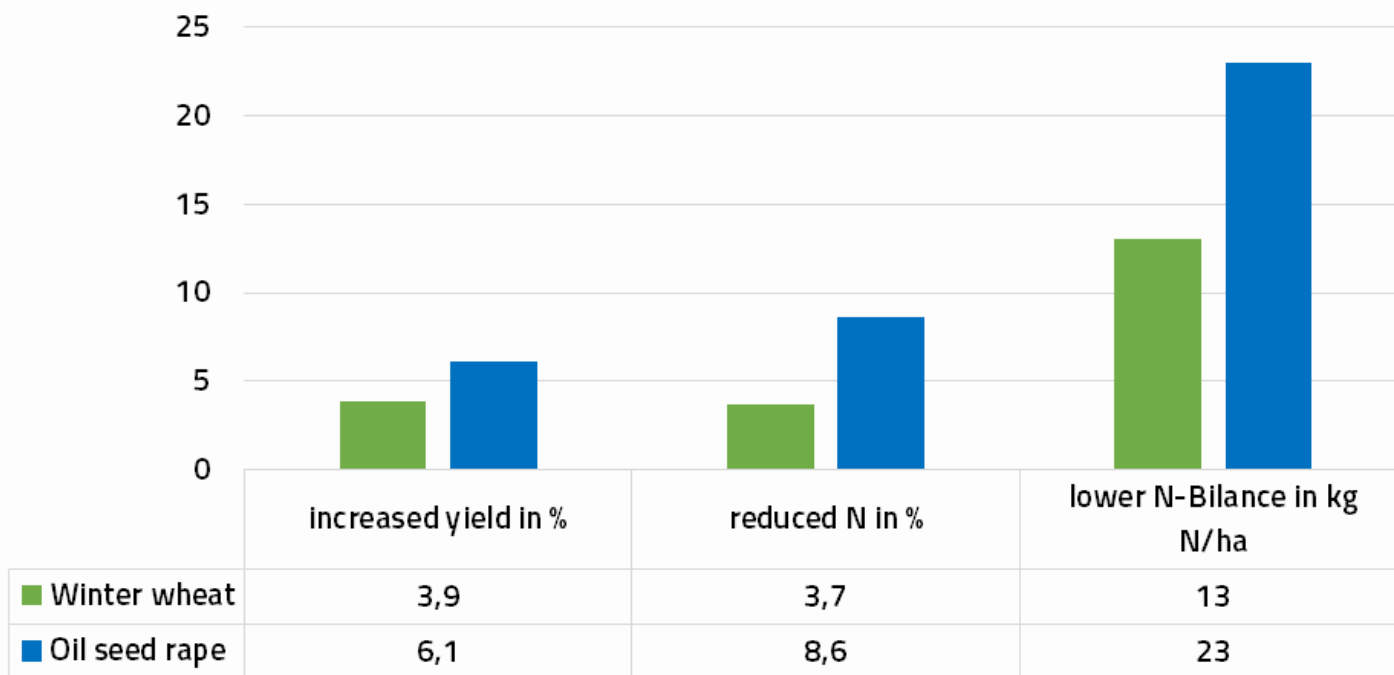


Suurem saak ja madalam N kogus



Suurem saak ja madalam N kogus

Advantage of variable compared to constant N-application
(trials 2001 - 2015)

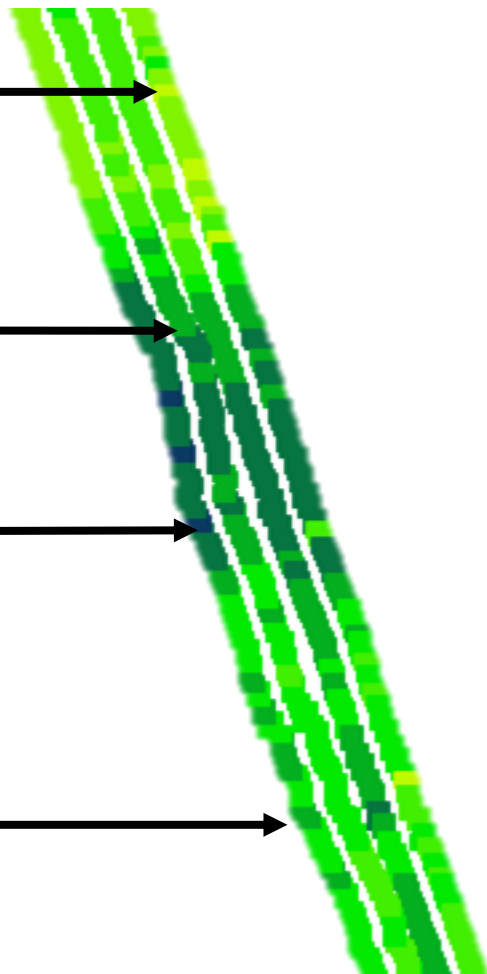


Tulemus:

Talinisu: 85 €/ha

Taliraps: 120 €/ha

Calculated with: N = 2,50 €/kg; TN = 30 €/dt; OSR = 50



Põllul on 6 kordne biomassi varieeruvus



Kas kõik taimed vajavad sarnast kogust?