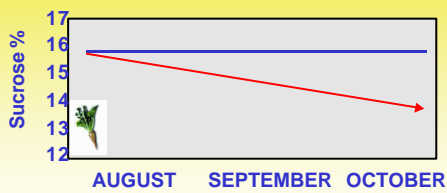


Crop Physiology in Sugar beet: Sugar backflow

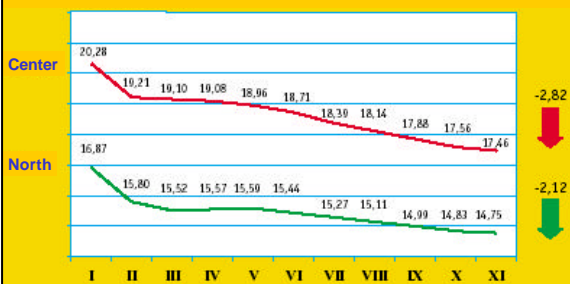
Pierdomenico Perata



Sugar backflow

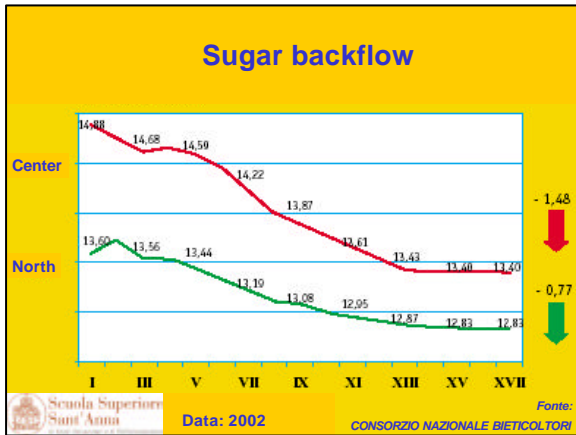


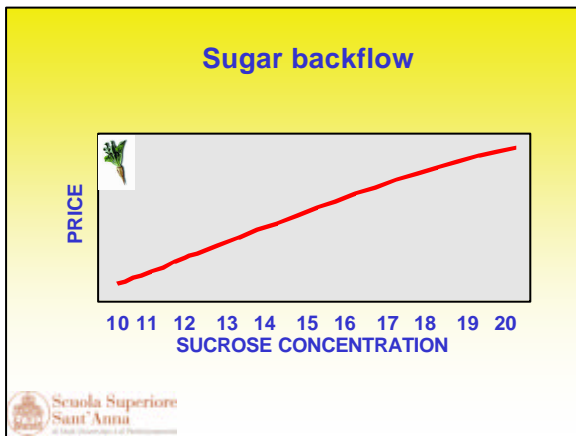
Sugar backflow




Data: 2001

Fonte: CONSORZIO NAZIONALE BIETICOLTORI





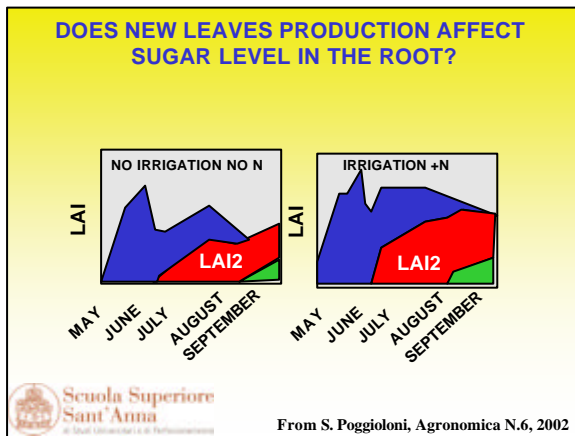
What is responsible for the sucrose backflow?

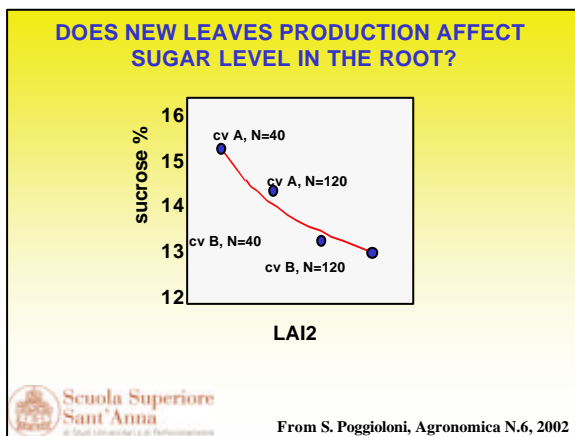


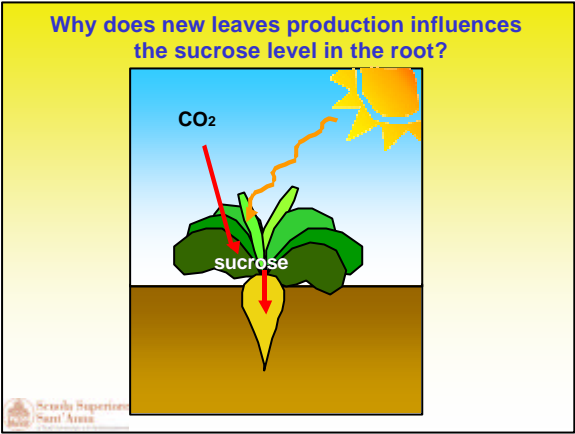
- CERCOSPORIOSIS**
- RIZOMANIA**
- Environmental STRESS**
- EXCESSIVE LEAF GROWTH**
- NITROGEN**

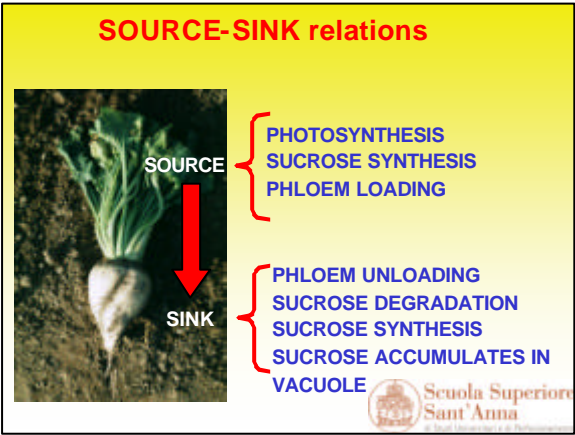
Scuola Superiore Sant'Anna

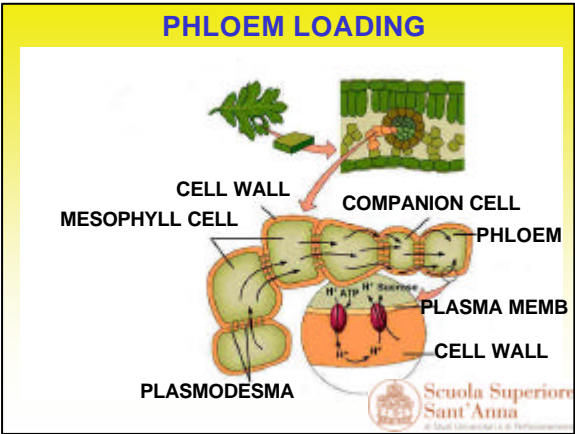












PHLOEM LOADING

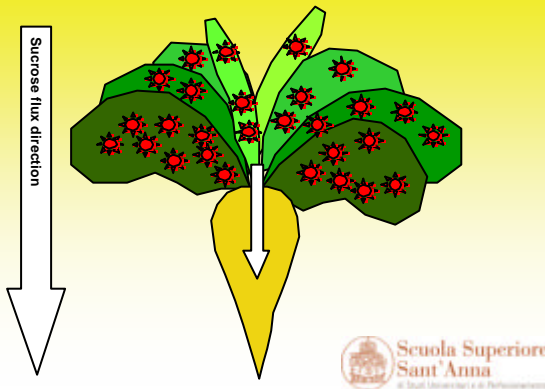
Sucrose transport from SOURCE tissues to SINK tissues is modulated by the efficiency of loading and unloading of the phloem

Sucrose loading requires a sucrose transporter

The sucrose transporter is codified by the SUT1 gene

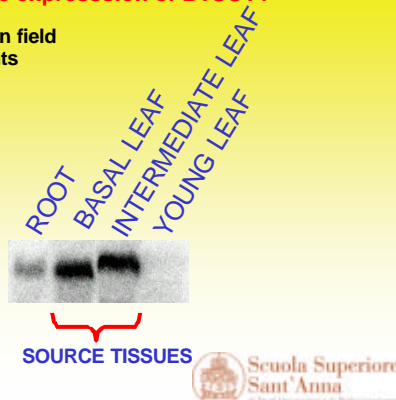



SUT1  is required for sucrose loading

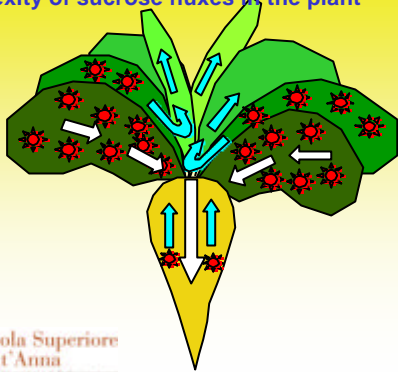


Gene expression of BvSUT1

Data from open field experiments

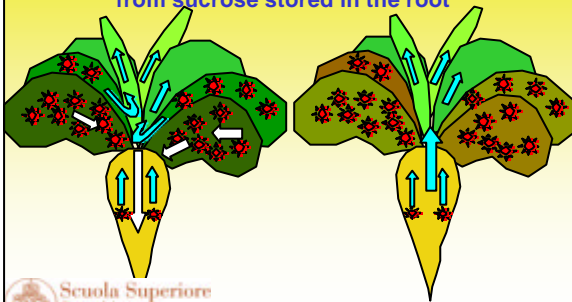


SUT1  is required for sucrose loading: the complexity of sucrose fluxes in the plant



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Sant'Anna
Università degli Studi di Trento

If the leaves are damaged this results in a reduction of source tissues and results in the production of new leaves using energy deriving from sucrose stored in the root



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SOURCE –SINK relation: suc backflow



Equilibrium between SOURCE & SINK:
sucrose accumulates in the root



Unbalance between SOURCE & SINK:
sucrose backflow from the root to the young leaves

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Conclusions

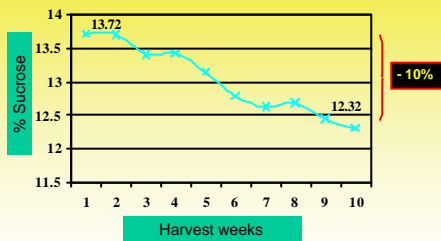
SUCROSE BACKFLOW IN SUGARBEET IS A COMPLEX PROCESS, INFLUENCED BY THE ENVIRONMENT AND BY AGRONOMICAL PRACTICES

Suc backflow results from:
 LOWER PHOTOSYNTHESIS
 NEW LEAVES PRODUCTION
 ROOT GROWTH NOT BALANCED WITH SUC IMPORT (DILUTION)

HOW TO SOLVE THIS PROBLEM:
 AVOID CERCOSPORIOSIS
 AVOID WATER STRESS IN HOT SEASON
 LIMIT NITROGEN USE
 USE VARIETIES THAT PRODUCE LESS LEAVES
 CONTROL LEAF PRODUCTION WITH GROWTH REGULATORS



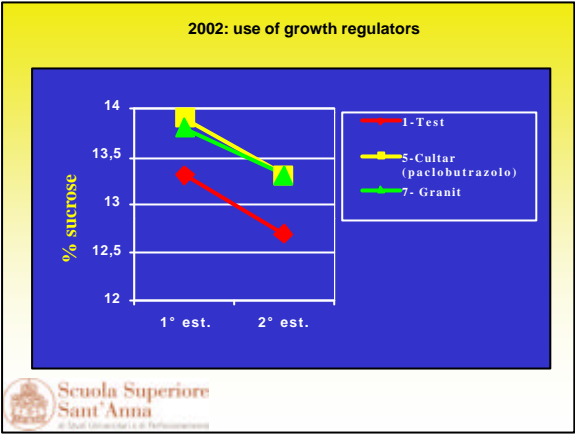
Sucrose backflow in 2002

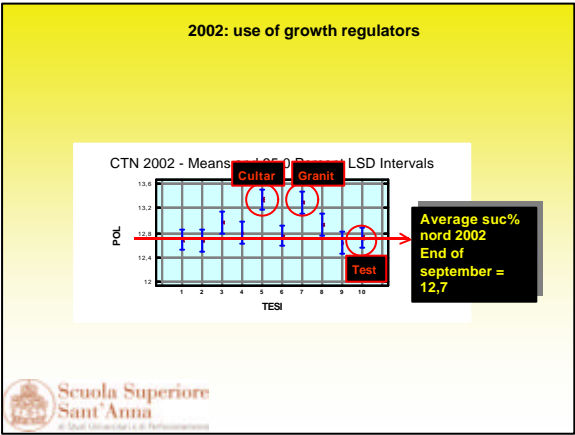


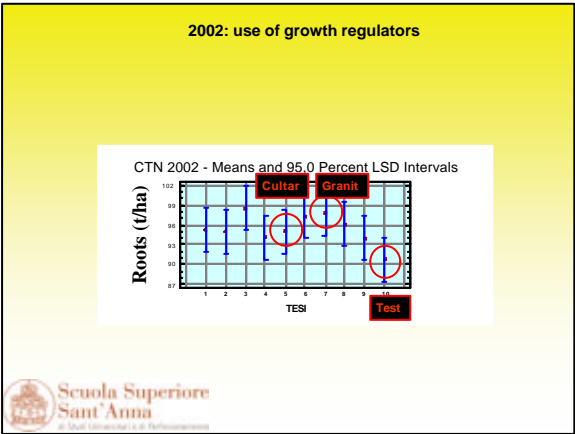
2002: use of growth regulators

Replicates N°	Products	Mode of action	Dose: l-kg/ha
5	CULTAR Syngenta Pacllobutrazol	Inhibitor of GA synthesis	1 (end of June)
7	GRANIT Bayer Bromuconazole	Fungicide Non in commercio in Italia	1 (end of June) + 1 (july)
10 TEST	-	-	-

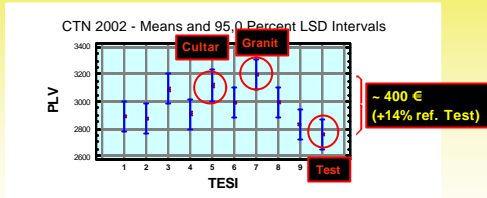




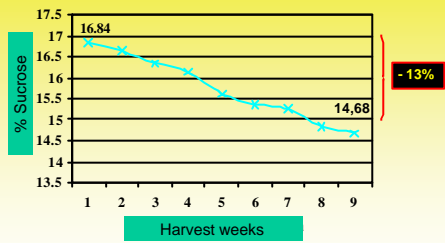




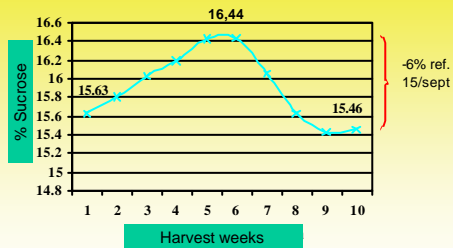
2002: use of growth regulators



2003: suc backflow



2004: suc backflow



2004: GROWTH REGULATORS

Area	Repl	Product	chemical	Dose 1 kg/ha	Date of treatment
Alfonsine (RA) e Montagnana (PD)	1	DE-SPROUT N	N-decanolo	9	30 agosto 1 settembre (1 solo trattamento)
	2	FAZOR + ETRAVON	Maleic Idrazide +wetting agent	7+0.25	
	3	REGALIS	Calcium proesadione	3	
	4	REGALIS + FAZOR + ETRAVON	Calcium proesadione + Maleic Idrazide +wetting agent	3 + 7 + 0.25	
	5	TEST	-	-	



2004: GROWTH REGULATORS

- Commercial name: **DE-SPROUT N**
- Chemical: **n-decanolo 79%**
- Distributed by: **AGRICO**
- E' un fitoregolatore ad azione di contatto, impiegato per il controllo selettivo dei germogli ascellari, primari e secondari, del tabacco.
- Distrugge i tessuti meristematici in rapido accrescimento dei germogli ascellari della coltura sottoposta a trattamento.
- Indicazioni di pericolo: **irritante, non classificato**
- Tempo di sicurezza: **7 giorni**



2004: GROWTH REGULATORS

- Nome commerciale: **FAZOR**
- Principio attivo: **idrazide maleica 60%**
- Distribuito da: **AGRIMPORT**
- E' un fitoregolatore ad azione sistemica per il controllo dei germogli ascellari, primari e secondari, del tabacco, nonché per il controllo del germogliamento di cipolla e aglio.
- Viene assorbito dalla pianta per via fogliare e traslocato per via linfatica. Nei germogli inibisce i processi respiratori delle cellule, impedendo così il normale sviluppo dei germogli.
- Indicazioni di pericolo: **non classificato**
- Tempo di sicurezza: **non richiesto**



2004: GROWTH REGULATORS

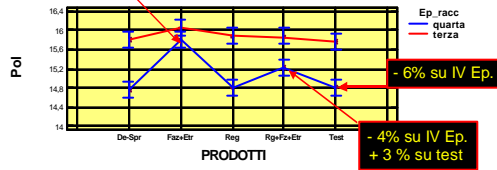
- Nome commerciale: **REGALIS**
- Principio attivo: *calcio-proesadione 10%*
- Distribuito da: **BASF**
- E' un regolatore dello sviluppo vegetativo del melo e del pero.
- Inibisce alcuni passaggi specifici del processo di biosintesi delle gibberelline, per cui induce una minor crescita longitudinale delle piante trattate
- Indicazioni di pericolo: **non classificato**
- Tempo di sicurezza: **55 giorni**



2004: GROWTH REGULATORS

- 1% su IV Ep.
+ 7% su test

Alfonsine e Montagnana - Interactions and 95,0 Percent LSD Intervals

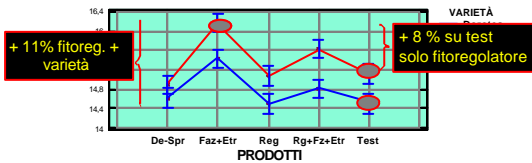


- 6% su IV Ep.
- 4% su IV Ep.
+ 3% su test



2004: GROWTH REGULATORS

Alfonsine e Montagnana 4a epoca - Interactions and 95,0 Percent LSD Intervals



+ 11% fitoreg. + varietà

+ 8% su test solo fitoregolatore