



Review of RAPIDC crop impact activities

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Outline

- Aims of RAPIDC crop activities
- Status quo of experimental campaigns in Malé Declaration countries
- Problems
- Discussion points raised at yesterday's workshop
- Timetable of activities



Aims of RAPIDC crop activities

- Assessment of impacts of air pollutants (e.g. ozone) on crop growth and crop production in South Asia (Malé Declaration countries) and southern Africa (APINA) using
 - clover bio-monitoring and
 - chemical protectant studies
- APCEN network functions as advisor to these crop impact activities

This scientific evidence will be used to

- Inform policy makers and the public
- Perform socio-economic risk assessments



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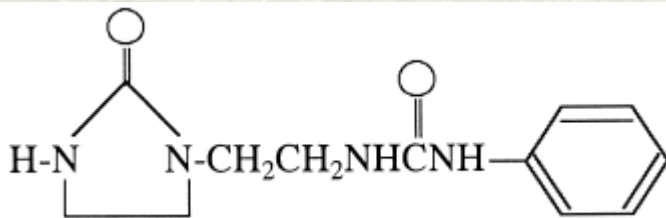
Clover biomonitoring experiment

- Highly standardised biomonitoring technique using two genotypes of white clover (*Trifolium repens* L.) cultivar Regal with differing sensitivity to ozone:
 - Ozone-sensitive genotype NC-S (left)
 - Ozone-resistant genotype NC-R (right)
- Response parameters: Visible leaf injury and NC-S/NC-R biomass ratio
- Duration of experiment: at least 4 months, i.e. 4 harvest



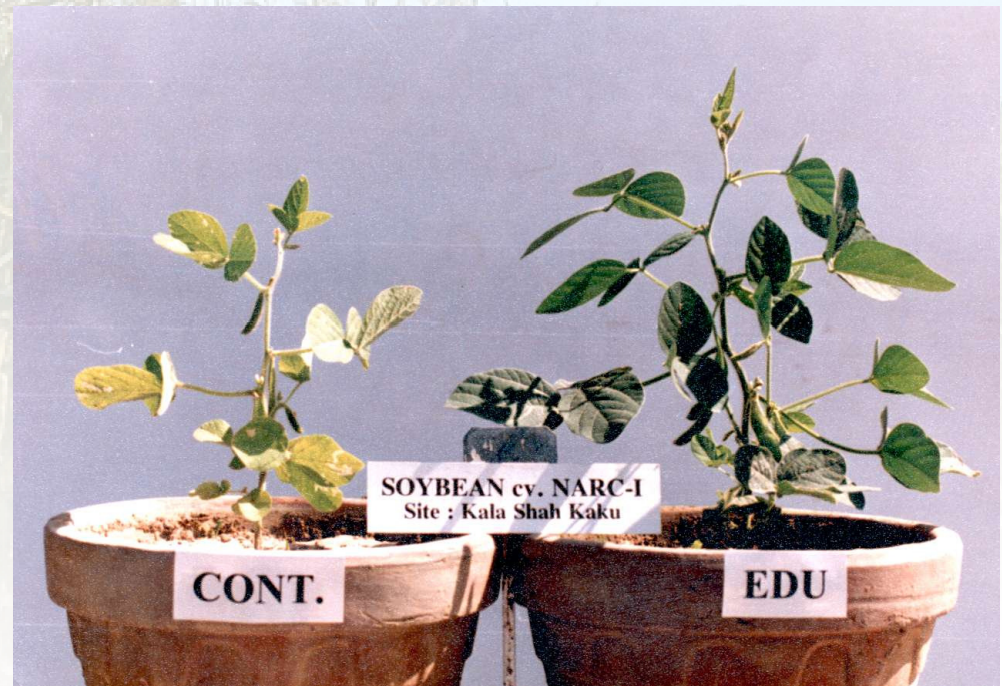
Chemical protectant study using EDU

EDU suppresses acute and chronic ozone injury on a variety of crop plants (e.g. Mung bean, wheat, potato, spinach, tobacco) under ambient O₃ conditions (Godzik & Manning, 1998)



Structural formula for N-(2-(2-oxo-1-imadazolidinyl)ethyl)-N'-phenylurea

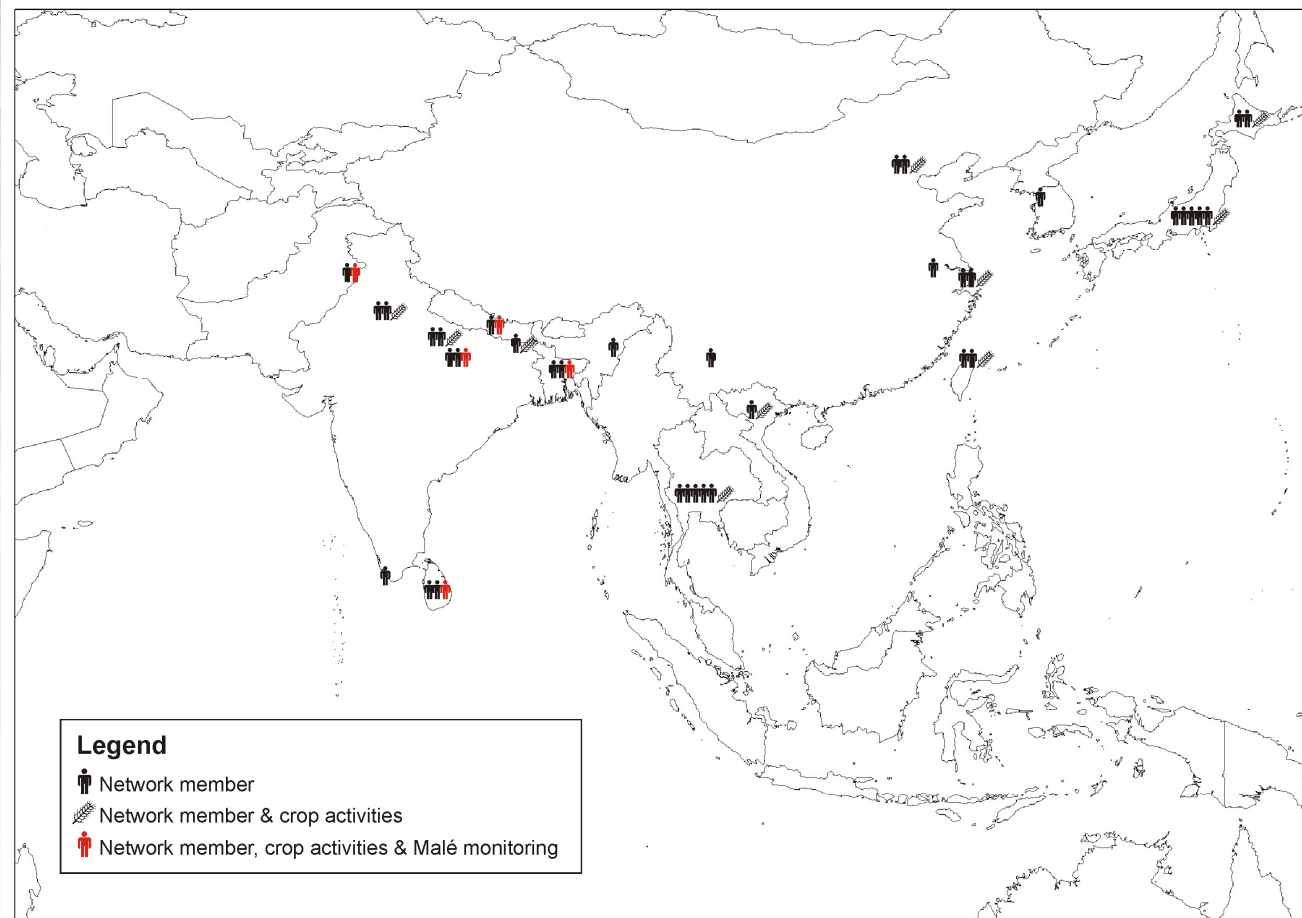
abbreviated as EDU for ethylenediurea



Pakistan soybean cv. NARC-1 showing protective effect of EDU at a roadside rural site in Lahore, Pakistan (photo courtesy of A. Wahid)



Status quo of experimental campaigns in Malé Declaration countries



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Status quo of experimental campaigns in Malé Declaration countries

- Bangladesh
 - Clover biomonitoring and EDU experiment (mung bean) terminated
- India
 - EDU experiment using mung bean, spinach and potato terminated
- Nepal
 - EDU experiment (mung bean) currently running
- Pakistan
 - Clover biomonitoring currently running, first EDU experiment (mung bean) terminated, second experiment started last week
- Sri Lanka
 - EDU experiment (mung bean) terminated recently

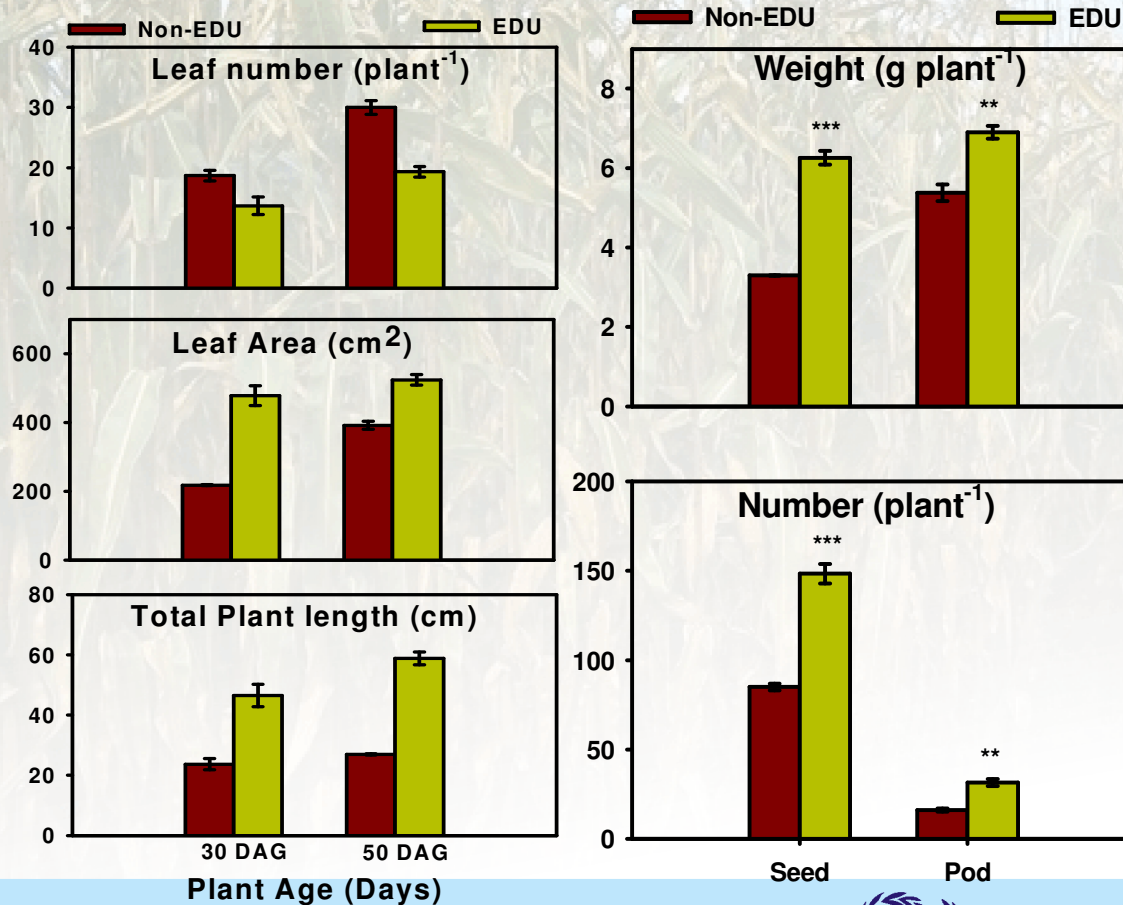
Clover bio-monitoring

Harvest number	Duration	Month / Days	Oven Dry Weight (g)	
			NC-S	NC-R
I	8.11.07 to 6.12.07	Nov (28)	0.986	1.248
II	6.12.07 to 3.01.08	Dec (28)	1.108	1.507
III	3.01.08 to 31.01.08	Jan (28)	0.831	0.928
IV	31.01.08 to 28.02.08	Feb (28)	3.153	2.685

Clover bio-monitoring

Harvest	Assessment Weeks	% Leaf Injury	
		NC-S	NC-R
I (November, 07)	I	NIL	NIL
	II	NIL	NIL
	III	NIL	NIL
	IV	NIL	NIL
II (December, 07)	I	NIL	NIL
	II	3.1	NIL
	III	6.8	NIL
	IV	22.8	NIL
III (January, 08)	I	NIL	NIL
	II	NIL	NIL
	III	NIL	NIL
	IV	NIL	NIL
IV (February, 08)	I	NIL	NIL
	II	6.4	NIL
	III	27.4	NIL
	IV	32.7	NIL

EDU chemical protectant study



The ozone protectant effect of EDU on mung bean plants exposed to ambient air pollution levels in Varanasi, India in 2006 (Agrawal)

Problems

- Plant import
- Transport/transfer
- Acclimatisation
- Pests
- EDU supply
- Passive sampling
- Data transfer



Discussion points raised at yesterday's workshop

Clover bio-monitoring

- appropriate growing season for clover according to local climate
- criteria for exposure to outdoor
- number of wicks
- stock plants established in Mymensingh, Bangladesh
- new experiment in Varanasi using three different local varieties of clover



Discussion points raised at yesterday's workshop

EDU chemical protectant study

- appropriate crops for different countries
- appropriate growing season for different crops according to local climate
- preparation of seeds (e.g. sterilisation, pesticide treatment)
- number of wicks
- species-specific dosage of EDU
- harvesting criteria of EDU experiment using mung bean

Discussion points raised at yesterday's workshop

General concerns

- dissemination and awareness raising of evidence
- preparation of final report (e.g. format, standardised analysis of data)
- future crop impact activities (e.g. Open Top Chambers)
- include link to climate change (global warming and global dimming)
- expand activities to Maldives and Iran, as well as multiple sites in participating countries

Timetable of activities

Activity	Deadline
Report outline	End of workshop
Call for data	End of April
Data analysis	Mid May
First draft of report	End of May
Final report	Mid June