



**IFAR 2007 Professional Development Program
Completion Report
[800 words]**

Instructions:

Please submit the completion report by email, using this form, through the sponsoring CGIAR Center to ifar@ifar4dev.org within three months after the completion of the fellowship.

Please check if Thalwitz Scholarship **Not**

Name of Applicant: Timur Abdurakhmanov

Sponsoring CGIAR Center
The International Potato Center (CIP-CAC)

I. Work Program goals achieved (maximum length: 200 words)

Research was conducted in Tashkent, Uzbekistan, in the laboratory of the Department of Bioorganic Chemistry and Biotechnology of Uzbek National University and the screen house built by the International Potato Center (CIP) at the Institute of Vegetables and Potato.

Laboratory (27 March to 20 August 2007): I studied the influence of adenine-derivatives + glycyrrhizin acid (biologically active substances (BAS)) on three CIP potato clones sub-cultured in-vitro, applying the following treatments:

- CIP standard medium (control);
- Control + 50mM NaCl and 0,01mM BAS;
- Control + 50mM NaCl and 0,1mM BAS;
- Control + 100mM NaCl and 0,01 mM BAS;
- Control + 100mM NaCl and 0,1mM BAS;
- Control + 50 mM NaCl;
- Control + 100mM NaCl.

No differences were observed between BAS and high saline concentration treatments. Clones 397065.28 and 397077.16 were the most tolerant (highest plant height and internode distances) of high saline concentrations..

Screenhouse: In-vitro plants belonging to CIP clones 397065.28, 397069.11 and 397077.16 were transplanted, following the above scheme, with 7 treatments (19 September – 28 December 2007). Inclusion of BAS in the treatment gave the highest number of tubers/plant for all three clones tested, and the highest average tuber weight.

II. Plans for follow-up (maximum length: 200 words)

This research, based on study of the influence that natural plant stimulators exert on enhancement of potato plant resistance to abiotic stress (namely salinity), suggested that work be undertaken to:

- create a standardized testing system for evaluating genotype ability to withstand abiotic stress;
- study the mechanisms that influence plant resistance to abiotic stress;
- develop user-friendly methods that farmers can apply to enhance the resistance of potato plants to abiotic stress.

III. Report budget utilization including whether budget was spent as planned (maximum length: 100 words)

ITEMS	\$US
<u>Equipment, materials:</u>	
PC computer + monitor, keyboard, UPS	1,500.00
Ink-jet color printer	200.00
Digital camera + memory	450.00
Modem + internet connection	250.00
Laboratory equipment (stirrer, air conditioner, water distiller, filters for laminar flow)	1,700.00
Laboratory glassware (tubes, Magentas, aluminum foil, etc.)	700.00
Sub-Total	4,800.00
<u>Research team:</u>	
Applicant (\$US 200.00 x 10 man/month)	2,000.00
Laboratory technician (\$US 150 x 10 man/month)	1,500.00
Casual labour (\$US 150 x 4 man/month)	600.00
Sub-Total	4,100.00
<u>Other costs:</u>	
Transport costs	200.00
Stationary	200.00
Thermal lamps + installation	700.00
Subscription to Journals, purchase of books and software	1,000.00
Sub-Total	2,100.00
TOTAL	11,000.00

IV. Assessment of the fellowship experience and general comments (maximum length: 300 words)

Conducting this research enabled me to develop and sharpen my knowledge of biotechnology, plant cultivation and the chemistry of BAS, and to use this knowledge to achieve practical goals. It also improved my ability to plan research, collect and analyze scientific research data, and to prepare and formulate research recommendations that could be useful for other researchers. Moreover, working on this project made it possible for me to collaborate with CIP and to develop a deeper understanding of the goals of the Consultative Group on International Agricultural Research.

We recognize that the treatments suggested in this experiment are not easily transferable to farmers' fields. But the principal objective of this research was to verify whether or not, with the addition of BAS, potato yield would be significantly affected by high saline concentrations in the media, under either laboratory or soil conditions. (In Uzbekistan, more than 60% of cultivated land is negatively affected by salinity.) Under laboratory conditions, the addition of BAS did not affect significantly in-vitro plant growth. But a noticeable effect was observed when in-vitro plantlets were transplanted in the soil under screen house conditions. In fact, clone 397069.11 produced the highest number of tubers/plant (8.0) in presence of 100 mM NaCl + 0.01 mM BAS.

Conversely, clones 397065.28 and 397077.16 produced 5.7 and 5.0 tubers/plant respectively, in the presence of 100 mM NaCl + 0.1 mM BAS and 50 mM NaCl + 0.1 mM BAS.