



Soil, Water and Climate

Center for Fertilization and Plant Nutrition (CFPN)

In April 2015 the Agricultural Research Organization and ICL signed a long-term cooperation agreement to conduct research in the field of fertilizers on the development of advanced fertilization and plant nutrition methods, with an emphasis on green fertilization • Despite the short time since its establishment, the Center is already running 14 research projects in fertilization-related topics and has aroused worldwide interest

Avi Obliganhertz

The need to ensure nutritional security in a world in which the population is growing at a dizzying rate and farmlands are dwindling has created considerable demand for effective fertilizers that increase and enhance the quality of agricultural yield, plant protection system and prolong plant shelf life.

Ironically, the number of researchers in the field of fertilization has fallen in recent years, and this critical area now suffers from a dearth of knowledge and research. Israel, who produces potassium and phosphorus fertilizers (which, with nitrogen, form the main basis of fertilizers) has opted to take up the challenge, with the aim of becoming a world center for knowledge in this field.

In April 2015, the Agricultural Research Organization (the Volcani Center) ARO and ICL signed a long-term cooperation agreement to

conduct researches in the field of fertilizers. The annual investment will be dedicated to research initiatives and the development of advanced fertilization and plant nutrition methods, with an emphasis on green fertilization, which will help establish Israel as a world leader in the field.

The **Center for Fertilization and Plant Nutrition (CFPN)**, which was set up at the Gilat Research Center for Arid & Semi-Arid Agricultural Research, the southern campus of the Agricultural Research Organization (the Volcani Center) ARO, is responsible for the implementation of this unique cooperation plan. The Center, whose advisory board consists of representatives of the ARO, ICL and the Bnei Shimon Regional Council, offers scholarships and research grants to master's and doctoral students from Israel and abroad. The research funded by the CFPN is supervised and carried out by scientists of the ARO, in collaboration





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with scientists from other research institutes. In addition, funds have been earmarked for the dissemination of knowledge throughout the world, conferences in Israel, courses to be held abroad and the advancement of the agricultural community of the Negev.

Dr. Uri Yermiyahu, director of the Gilat Research Center and the CFPN, explains that the primary goal of this new research center is to meet the needs of growers in Israel and abroad in nutrition-related areas: "Our aim is to develop advanced fertilization and plant nutrition solutions that will facilitate sustainable fertilization practice and ensure an adequate supply of high-quality food throughout the world. There is no center anywhere in the world with such a wide range of activities and a mutual cooperation agreement with a commercial concern as big as ICL, one of the world's leading companies in the field.

"The cooperation between industry and a government research institute is significant but unusual, and it can be a good example for

collaboration between government and industry for appropriate goals."

In order to develop and survive properly, a plant needs nutrients that are found in the soil, such as nitrogen, potassium and phosphorus. These nutrients participate in the metabolic processes occurring in the plant and optimize the plant's growth. Balanced and proper fertilization increases the yield, upgrades the quality of the agricultural produce, enhances the health benefits of the food, prolongs its shelf life, and improves the plant's resistance to diseases, pests and harmful weather conditions. Correct application of fertilizers can reduce the use of pesticides and minimize environmental damage.

The research carried out by the CFPN examines the nutrients needed for producing food, improving its quality and defining an optimal fertilization regime, with minimal impact on the environment. The research currently being conducted focuses on:

1. Evaluation of new fertilizers and application methods on crops.
2. Optimization of fertilization practices in selected crops.
3. Creating advanced new soil and plant nutrient diagnostic tools and methods.
4. Identifying and evaluating methods for recycling nutrients from organic and mineral waste products.
5. Development of fertilization practices to improve nutrient foundations in crops.
6. Study and development of materials and methods for advanced foliar fertilization.
7. Study and development of methods to enhance plant nutrient-use efficiency.
8. Development of methods for improving soil health, postharvest practices and stress resistance.



Researchers and students in a net house for teff fertilization research.
photo: Nataly Cohen Kadosh

|| *Despite the short time since its establishment, the Center is currently running 14 research studies, including a project to develop fertilization practice for a variety of crops (pomegranates, sesame, teff and cassava); the development of new tools for enabling faster, more efficient plant nutrition diagnostics; improving the release rate and capabilities of new fertilizers and more*



Experiment in pomegranate growing in various conditions. photo: Nataly Cohen Kadosh

9. Development of advanced knowledge transfer and sharing of tools for plant nutrition in developing countries.

The advisory board of the Center, which meets every three months, determines the research topics. In addition, there is a scientific committee that guides the Center's activities. This committee that convenes once a year is comprised of worldwide experts from all over the world, with expertise in fields that have direct bearing on the work of the CFPN.

Despite the short time since its establishment, the Center is currently 14 research studies, including a project to develop fertilization practices for a variety of crops, such as **pomegranates, sesame, teff** and **cassava**. Teff is the cereal on which agriculture in Ethiopia is based, while cassava is an important root crop whose principle component is starch, which grows in many countries in Africa Asia and South America.

Other projects are focusing on the development of new tools for enabling faster, more efficient plant nutrition diagnostics and improving the release rate and capabilities of new fertilizers. In addition, at the request of growers, CFPN scientists are currently taking part in an avocado fertilization project in Northern Israel, as well as a potato and peanut fertilization project in the Negev.

Dr. Yermiyahu stresses that most of the knowledge gleaned from the research will be accessible to the public and will be circulated in Israel and abroad.

"The Center's contribution is intended to impact world agriculture directly, as in the case of cassava and teff, and our research will benefit developing countries.

"More contribution is to train the field's future professionals, including students from all over the world. We already have six students from Asia and Africa, and I hope that next year we will be offering an international course." •



Dr. Uri Yermiyahu,
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Research Center
& CFPN Manager
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