

Representation regarding Israeli Agriculture Technologies and
judicious use of water in Agriculture.

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Respected Maharaja Sahib,

It is very heartening to note that Punjab Government is seeking Israel's help to acquire new methods & technologies for the development of agriculture in the state. Israel is a world leader in agriculture technology despite the fact that geography of Israel is not naturally conducive to agriculture as more than half of land being desert and the country as a whole has very limited water resources. Only 20 percent area is naturally arable and the share of agriculture in GDP is just 2.8 percent. Farm workers are only 3.7 percent of the total work force and agriculture export is just 3.6 percent of total exports. But inspite of all these factors, Israel has made strides in so many areas of agriculture and we can definitely be very much benefited by adopting their techniques.

Irrigation is one of the main field where Israeli technique in using waste water and the brackish water (saline & saltish water) can be put to use for irrigation. In Israel 30 percent of irrigation is done by waste water and 16 percent by saline water. This is done by using a different technique where waste water is made to pass through effluent drippers which are clog resistant. Filter traps consisting of sharply pointed plastic units are installed inside the irrigation lines. This arrangement initiates a whirling flow in the water passing thorough it and sweeps away any dirt or other particles. In the case of brackish water, Israel has done a remarkable deed by putting it to use both for aquaculture & agriculture. Brackish water is extracted from underground and after it is being recycled by state of art recycling systems is made fit for both aquaculture and agriculture, thus maximising its efficient use. Putting both waste water and brackish water can really benefit Punjab as we know that there is very acute problem of waste water in the towns and villages of the state and the brackish water has been playing havoc in the south west districts as it is unfit for both irrigation as well as for human consumption and at the same time creating water logging as it is not being extracted from underground. Israeli technique can be used to rear fish especially which grow in saline water such as prawns and shrimps and later this water can be used for irrigation purposes. Some people in South west Punjab has already successfully done this prawn & shrimp farming. We should study that how Israel in its southern Nagev region and its eastern parts is putting underground saline water in to the use of both aquaculture & agriculture. This can also solve the problem of water logging in the long run.

We can also learn much from the Dairy industry of Israel. The principle of an Israeli dairy farm is that producing more milk with less dairy cows improves the economic performance of the farm unit and also reduces ecological imbalances. Israel and Punjab both face the same problem of having extreme summer in which the production of the milk is decreased due to the heat stress and Israel has successfully checked it by developing successful methods of cooling to reduce the body temperature of the cows. In the same way they have been able to make genetic improvement in their cows to face extreme climate (temperature & relative humidity). Israeli Holstein Friesien cows are among the world's best performing cows. R & D has resulted exemplary success in precise nutrition, fertility management and veterinary services. The milk yield per lactation of an Israeli cow is the highest in the world.

As the ocean fish populations are declining and threatened through out the world, the fresh water fisheries present a new hope and in Israel these fisheries have developed and progressed so much by adopting new technologies that Israel has become a competitor to China which till now is the world leader in this field. New fish species like carp, Tilapia, Grass carp, flat head mullet and rainbow trout have been introduced. The range of fish products has been expanded and fish tourism has been encouraged. Punjab presents an ideal place for such activities.

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Israel has gained a considerable success in reducing the use of pesticides by adopting the system of integrated pest management system (IPM). In this system pests are controlled by using biological means. This includes the development and introduction of beneficial natural enemies (e.g. Predatory mites, predatory beetles and parasitic wasps etc) and it is an alternative to the chemical pesticides in the terms of effectiveness, cost and safety. In addition to it the sterile male pests are introduced in to the pest population to trick females in to unsuccessful breeding encounters providing a form of birth control and reducing reproduction rate. Moreover the pheromones secreted by insects are isolated to trap the males and confuse mating pattern. Chemical pesticides are used only if the pest population reaches a specific threshold level where it can cause an economic injury. Pest population is to be controlled and not to be eliminated by chemical pesticides as the surviving few becomes resistant and develop immunity to the pesticides which is passed to the next generations. In Israel 65 percent of citrus orchards are under integrated pest management and in the same way many other crops are under the ambit of IPM and thus the use of chemical pesticides have been reduced to a considerable extent. Many countries are importing these beneficial insects from Israeli insectaries. We should discuss this system and try to introduce it in Punjab as it will be a step towards organic farming and will also reduce the cost of production.

As we know that cross pollination by insects is very helpful in both increasing the yield and quality of crop output and Israel is producing such insects. Bumble bees are produced for natural pollination in green houses and open fields and it has been noted that they have increased the yield in the green houses by 25 percent.

We should also study the next generation subsurface drip irrigation (SDI) developed by Israel which is more suitable for treated waste water and results in even more efficient water use and crop growth. In this subsurface drip irrigation the fertilizer savings upto 95% are being reported from recent university field tests using drip fertigation and slow water delivery as compared to time released and irrigation by micro spray heads. New emitters slow down the supply of water and can reduce it to one liter per hour.

Fruit cultivation occupies a prominent place in Israel's agriculture as it forms 25 percent of total farm produce in which 10 percent is the citrus and thus citrus plays a pivotal role in the whole of the fruit production. Or (orri) is the main citrus mandarin which being of a superior quality is slowly replacing other mandarins, sweet oranges and grape fruit. It has 26 percent share in the total citrus export. It is a hybrid of Temple and Dancy varieties. Till now, this strain has not been imported in centers of excellences in India and we should try to import it even if it costs some more than expected expenses. Pomelo is another mandarin which is quite sweet, but its small size is a handicap. Israeli Valencia Orange is a late harvesting variety which may give fruit from March to May. Navel orange has no functional pollen and they do not cross pollinate with other citrus and thus produce seedless fruits. Navel is an early variety which provide fruit from October to January. Star ruby (red) is the main citrus fruit followed by white grape fruit Jaffa sweetie. Jaffa sweetie is a cross between pomelo and grape fruit. In shape and juice it is like grape fruit, but tastes as sweet as pomelo. Sweetness is not due to excess of sugar, but due to lack of acid. Although being sweet, yet it is low in calories (24 to 40 in one fruit) and may become an attraction to present and potential diabetic patients in India. Israel process 39 percent of its total citrus produce. We should study its processing varieties and also the working of its processing plants. Citrus export is 31 percent of the total citrus produce of which 50 percent is exported to European markets and for which Israelis are adopting European quality management requirements such as Eurep Gap 2000, ISO standards and crop management protocols. We will also have to adopt these measures if we are to go for citrus export in a big way in the future and Israel can help in this.

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Mango is another fruit which can be improved both in yield and quality with the help of Israeli technology. I want to bring to your kind notice that out of 29 centers of excellence working in India, only 7 have management of Mango cluster in their agreements and these includes Haryana, UP and Gujrat etc, and Punjab has been left out. It is surprising that Punjab has a centre of excellence in Hoshiarpur where mango is considered as the son of the soil, but mango has been left out. I request you to do the needful and get mango cluster management included in it. India has an average mango yield of 5.5 metric tons per hectare where as Israel grow 35 to 40 metric tons per hectare. Nectarine Mango is one of the best variety which has been developed by 'Ben Dor fruits and nurseries'. Mango trees are contained in size by trimming so that they get the maximum sun light which gives a huge yield. The other important favourable factor is the big lengthy picking season starting from June till December. Israeli technology has helped to improve the quality of the fruit which is evident from the quality of "Kessar Queen" of Gujrat where mango growers completely follow the Israeli techniques.

Israeli loquat is also considered as very productive as its yield can reach up to 40 tons per hectare. The other important fruits are Plum, granate, coloured plum, lemon shaped lamoon plum, pita peach, olive, guava and dates. All these fruits can be considered and their potential can be evaluated.

Green House Technology in Israel can also be studied as it will be very helpful to the farmers having small land holdings. A Green House can produce 300 tons of tomato per hectare per season i.e. four times harvested in open fields. We should also try to study the new strains of vegetables developed in Israel which can suit our climatic conditions. They have invented a slow ripening tomato in hot climate which is considered as world's first long shelf life commercial tomato. A potato strain grown during summers has also been developed. They both can be suitable for Punjab.

Floriculture in Israel now occupies an important status in agriculture and it has 20 percent share in total agriculture production. Farmers produce high quality and wide variety of flowers (over 100). These include cut flowers such as roses, carnations, Lilies and Tulips. Once a distant second to citrus, export of flowers and ornamental plants now holds the first place.

Cotton cultivation is done with drip irrigation. The two main varieties are Acala and Pima which give 5.5 and 5 tons yield per hectare respectively and this yield is the highest in the world.

Israel has also been able to tackle the problem of the safe storage of grains and pulses. They have invented grain cocoons which provide simple and cheap way to keep grain market fresh. In these huge bags grains and pulses are protected from pests and moulds even in the extreme heat and humidity.

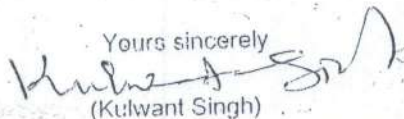
AKIS/RD stands for Agriculture knowledge and information system for rural development. This is the main extension system for agriculture in Israel which is very pragmatic and efficient. It consists of three pillars and they are Research, higher education and extension. These three pillars are complimentary to each other and they have been planned and sequenced as a system rather than separate entities. Linking of these triangle institutions with their common clients i.e. the farmers has been done with a very systematic planning. In principle, agriculture extension receives relevant information from agriculture education system and feeds back the field observations to this system. Extension services also include subjects like credit, supplies, marketing and markets. We should study this system.

Geography has provided one common factor between Israel and Punjab that both are practically situated on the same latitude e.g. 31 degree North.

I request your good self to bring good agriculture technologies from Israel for the progress and betterment of the Punjab farmers.

With Regards,

Yours sincerely



(Kulwant Singh)

(President Kissan Vikas Chamber Punjab)

Date: 18th July 2017.