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FOOD SECURITY IN PAKISTAN

Farooq Ahmad
Department of Agri. Entomology, University of Agriculture, Faisalabad
Corresponding author's e-mail: fachohan66@yahoo.com

Wheat is the major staple food of people of Pakistan and the net annual requirement for a population of 165 million including seed requirement is more than 21mmt besides unavoidable post production losses and carry-over. Over-estimate of wheat production (23.295mmt) during 2006-07 led to export five lac mmt through regular channels and more than that through irregular channels to neighbouring food deficient countries. In spite of efforts made to import wheat later on, at a much higher rate, the situation did not improve. Recent increase in support price(52%), as an incentive to boost production is likely to provide temporary relief but not a permanent solution to the problem because of high and ever-increasing cost of agriculture in-puts and severe shortage of irrigation water. The solution, however, lies in enhancing per unit production through liberal financial support to small farmers, adequate availability of fertilizers, weedicides and certified seed at affordable prices, containment of post-harvest losses and strong curb on wheat smuggling. Adequate irrigation water supply, of course, occupies the pivotal role in enhancing agriculture production and that is linked with the construction of big dames, at least one in the shortest possible time and the one whose feasibility has already been worked out. It is only kalabagdam.

Keywords: Food security, staple food, wheat production, post harvest losses, wheat import

INTRODUCTION

Food is the basic need of man as such food security is vital for the health of a nation, more so, for its independence and honourable living among the community of nations in the world. A hungry nation, what to speak of honour and prestige, cannot even maintain its independence. For achieving primary goal of stability of a political Government, it is very essential to realise the importance of food security in the country. No sensible nation would tolerate food insecurity particularly in the face of mounting population pressure which leads to further widening of already existing disparities. Furthermore, it can lead to conflicts, create chaos and tyranny among the people. Primary goal of every individual nation is to fight against hunger.

FAO has defined Food Security as "access by all people at all times to the food needed for an active and healthy life''. It reflects the desire to eliminate hunger and malnutrition (WFP, 2003). The World Food Summit (1996) has elaborated the concept by adding into it the dimension "when all the people at all the times have physical and economic access to sufficient, safe and nutritious food to meet the dietary needs and food preferences for active and healthy life". USAID in this backdrop has defined food security, as "when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for productive and healthy life". Food security can be broadly divided into three main components, namely, ①Food availability, ②Physical access and economic access to food and, ③Effective food utilization or absorption (WFP, 2003).

Food security is equally important on national as well as global level. According to World Food Summit (WFS) declaration (1996), more than eight hundred million people mainly in the developing countries, don't have enough food to meet their basic nutritional needs. Short-fall in food grain production can lead to peace upsetting in the world. Brown (2004) reported food security deterioration in the world and stated that during 2003 food grain shortfall of 105 million tons was at the highest level. It was 5% of the annual world consumption. FAO assessed a short-fall of 16 mmt in wheat production during 2007-08, mainly because of shift in area from wheat to maize to meet bio-fuel needs in America, Australia and Canada. This also shows the contradiction in the policy of advanced nations; in 1980 U.S. Presidential Commission on World Hunger reiterated that where the right to adequate food remains unrealized, the protection of other human rights becomes a mockery''.

Concerted efforts are needed to enhance food grain production in the world and to investigate problems that stand in the way of meeting food needs of humanity so as to avoid peace upsetting and famine occurrence in the world. Several countries have constitutional provision on the rights of citizens to adequate food and Pakistan is also one of them. Article 38 of the Constitution of Pakistan states that, "the State shall provide basic necessities of life such as food, clothing, housing, education and medical relief".

Wheat productions and requirements of Pakistan

a) Production

Wheat and rice are the two main food grains of Pakistan. Wheat is, however, the major staple food of the people. Rice has a great contribution to foreign exchange earnings while wheat mainly meets food needs. It is the largest grown crop over an area more than eight million hectares. Share of wheat in GDP is 3% and in agriculture as a whole 14.1%. During the year 2006-07 Pakistan produced 23.295mmt, while in the year 2007-08 it was grown over an area of 8.414 m/ha. This was 1.9% less than that of the previous year with a production target of 21.749mmt. However, a large majority of experts in the field of agriculture criticizes the correctness of both of these estimates. They are of the view that production did not exceed 20mmt during 2006-07. The Govt have announced the achieved production target of 21.7mmt for the year 2007-08. Wheat production data for the period from 1990-91 to 2007-08 have been given in Table 1 and presented graphically in Fig.1.

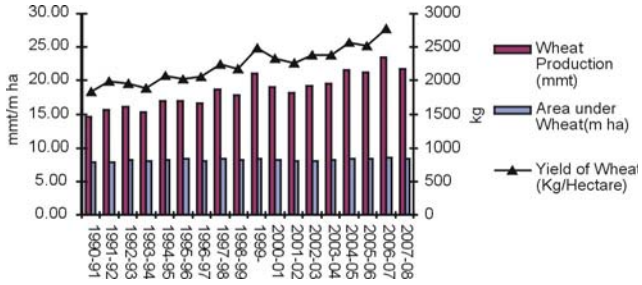

Fig. 1. Area, production and per ha. yield of wheat

b) Requirements

Our population now stands at 165 million. The data show that every year more than 32 lac new mouths are being added and the population is expected to reach a level of nearly 170 million by the year 2010 (Table 1).

(1) Net wheat requirement:

For 165 million people, we require about 20.8 mmt of wheat (net availability) to fulfil our consumption needs. Net availability would mean annual consumption requirements excluding seed requirement, carry over and unavoidable post harvest losses, etc. The net requirements after 3 year would be around 21.8 mmt besides nearly one mmt for seed, at least 40 days consumption carry over, 10% as post harvest losses and grain used in animal feed, etc. (Table 1). In the present study carry over equal to 40 days consumption requirement instead of 70 days, the international standard, has been considered appropriate for our conditions keeping in view non-availability of adequate additional storage facility.

A critical appraisal of population data of Pakistan shows that it was 109.72 million in 1990-91, which increased to 165.0 million in 2007-08, thus showing an increase of 55.28 million (50.38%) as against wheat production of 14.57mmt and 21.7 mmt (E) in the two respective years. The increase in production is 7.13 mmt (48.94%).

The population data further indicate that there is some decreasing trend in the population increase rate. The population, however, needs to be decreased further as it is very important factor in the food grain security.

(2) Seed requirements:

More than 0.8 mmt of wheat is required for seed purposes. In case of late sowing higher quantity of seed is needed. Economic Advisor's Division, while calculating total requirements of wheat for consumption doesn't give due attention to this fact. They consider seed and post harvest losses both as 10% which is far less than the reality.

c) Post harvest losses

Reliable studies indicate that post harvest losses of major food commodities in developing countries are enormous: Hall (1970) reported food grain storage losses to the tune of 30% in South East Asia, 25-55% in South American countries, 8-25% in India. Even in USA 5% losses are on record. In Pakistan, Chaudhary (1980) carried out comprehensive studies on post harvest losses of food grain in all the four provinces of Pakistan. The study included losses occurring during harvesting, threshing, cleaning, drying, milling, storage, processing, cooking and consumption. According to him the aggregate losses during various post harvest operations in Pakistan are 17.1% in paddy, 15.3% in wheat, and 12.6% in maize (Table 2). These estimates were based on inquiry. Post harvest losses of wheat estimated by the Indian workers are to the tune of 9.33% (Anonymous, 1985). Some studies based on empirical evidence, carried out by the Department of Agri. Entomology UAF, showed 7.37% post harvest losses of wheat but it was on experimental scale only. (Sabri *et al*., 1984, Khan *et al*., 1985). WFP (2003) reported approximately 12.5% of wheat is wasted on way from field to consumer. Most of the Pakistani scientists strongly believe that 10% post harvest losses of wheat are not at all uncommon in our country (Ahmad, 1980, Ahmad *et al*., 1992). In the present study, therefore, 10% post harvest losses have been considered so as to arrive at reliable estimate for our future requirements.

Table 1. Data regarding population, wheat production, requirement, import, export, seed requirement, post harvest losses, support price, per capita/ annum consumption of Pakistan

Years	Population (million)	Wheat consumption requirement @126kg /capita/annum (mmt)	Wheat Production (mmt)	Wheat Import (mmt)	Wheat Export (mmt)	Actual carry over	Seed requirement @ 1 ton /10 ha. (mmt)	PH losses (mmt)	Net availability (mmt)	Required Carry over (40 days consumption) mmt	Per capita/annum consumption kg		Support price of wheat/40kg	% increase in price	% increase in production
											Calculated	Reported by Planning Division			
1990-91	112.61	14.19	14.57	1.60	0	1.51	0.79	1.46	13.92	1.36	110.18	-	112	-	-
1991-92	115.54	14.56	15.68	0.63	0	1	0.79	1.57	15.47	1.59	125.21	-	124	10.7	7.7
1992-93	118.5	14.93	16.16	1.64	0	0.51	0.83	1.62	16.35	1.74	133.65	-	130	4.8	3
1993-94	121.55	15.32	15.21	2.36	0	1.01	0.80	1.52	15.76	1.62	121.35	-	160	23.1	-5.8
1994-95	124.49	15.69	17	1.41	0	0.78	0.82	1.70	16.91	1.77	129.53	-	160	0	11.8
1995-96	127.51	16.07	16.91	2.27	0	0.39	0.84	1.69	17.43	1.87	133.63	-	173	8.1	-0.6
1996-97	130.56	16.45	16.65	1.93	0	0.46	0.81	1.67	16.49	1.76	122.78	-	240	38.7	-1.5
1997-98	133.61	16.83	18.69	2.38	0	0.91	0.84	1.87	18.83	1.96	134.11	-	240	0	12.3
1998-99	136.64	17.22	17.86	4.11	0	0.98	0.82	1.79	20.27	2.11	141.14	140.92	240	0	-4.5
1999-00	139.76	17.61	21.08	2.33	0	0.70	0.85	2.11	21.43	2.27	148.35	131.48	300	25	18
2000-01	142.86	18	19.02	1.59	0.08	3.55	0.82	1.90	18.60	1.65	105.32	113.79	300	0	-9.7
2001-02	145.96	18.39	18.23	0	0.643	3.68	0.81	1.82	19.15	1.70	106	114.92	300	0	-4.2
2002-03	149.03	18.78	19.18	0	1.338	0.99	0.80	1.92	20.14	2.10	128.49	119.23	300	0	5.2
2003-04	150.47	18.96	19.50	0	0.043	0.16	0.82	1.95	17.72	1.92	116.69	119.31	350	16.7	1.7
2004-05	153.93	18.40	21.61	1.39	0	0.35	0.84	2.16	20.17	2.17	128.74	115.54	400	14.3	10.8
2005-06	156.76	19.75	21.28	0.82	0	2.11	0.84	2.13	19.48	1.90	110.81	117.45	415	3.8	-1.6
2006-07	160.76	19.26	23.52	1.70	0	0.50	0.85	2.35	24.13	2.59	146.99	-	425	2.4	10.5
2007-08	163.49	20.60	21.75		0		0.83	2.18	19.24	0	117.67	-	625	47.1	-7.5
2008-09	166.69	21	-	-	-	-	-	-	-	-	-	-	950	52	-
2009-10	169.99	21.42	-	-	-	-	-	-	-	-	-	-	-	-	-
2010-11	173	21.80	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2. Aggregate losses in wheat at post-harvest level in Pakistan

Province	Aggregate loss	Threshing and winnowing stage	Farm level	Market level (1)	Public sector (2)	Terminal (3)	Consumer level (4)
Punjab	13.783	1.59	1.46	7.316	5.493		6.51
Sindh	15.692	1.72	1.10	6.935	6.234	1.909	8.61
Balochistan	14.780	1.46	1.69	3.389	3.613		8.46
N.W.F.P.	15.606	1.49	1.69	4.638	5.191		7.07
Pakistan	15.376	1.59	1.47	7.884	6.449	1.909	7.97

d) Wheat Import

Wheat import has been a regular feature for meeting our food requirements, excepting a gap of 3 years when we had a bumper crop of our own. WTO considers Pakistan as a net food insecure as well as a net wheat importing developing country (NFIDC). Annual wheat import during the period from 1990-91 to 2007-08, ranged between 0.5 and 4.11mmt and averaged 1.87mmt. During 1998-99, however, the import was exceptionally very high (4.11mmt). The cost of wheat imported during 2007-08 was u.s. $ 500/ton, which comes to Rs. 1600/md of 40kg, this money could be easily diverted towards the welfare of the wheat growers.

e) Per capita wheat consumption

Another important aspect of wheat security in Pakistan is per capita consumption. It carries basic importance in accurate planning for the future, and in time utilizing all possible resources. It has, no doubt, a strong relationship with the consumption of other food grains and their prevailing per unit price as well as their availability particularly that of rice. The per capita per annum consumption of wheat during the last 18 years ranged between 110 and 147.9 and averaged 128 Kg / per capita /per annum which is very close to the international standard (126kg). It is worthwhile to suggest that well planned research should to be carried out for accurate assessment of per capita consumption. The per capita per annum consumption reported in Economic Survey of Pakistan is also shown in the figure for comparison (Fig.2, Table 1).

Effort has been made in the present endeavour to consider all possible factors such as seed requirement, post harvest losses and carryover as food reserve. Some quantity of grain also goes to animal feed industry and that should also be accurately assessed.

Higher per capita consumption in certain years leads to presume the unlawful smuggling of wheat “Atta” or grain through unlawful channels.

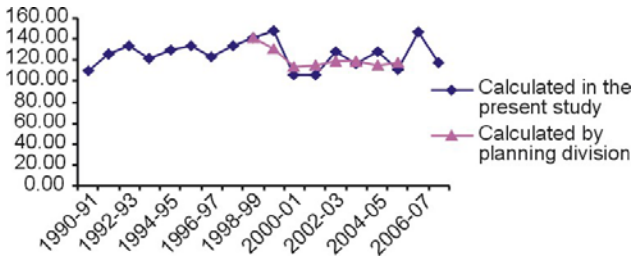

Fig. 2. Per capita, per annum availability of wheat for consumption

f) Food grains carry over

The carry over (in days’ consumption requirements) is very important. On international level the standard is 70 days consumption surplus. According to Brown (2004) and Chabot and Dorosch (2006)70days consumption surplus is the minimum level for food security. Wheat after harvest takes many weeks to reach the stores and delivery to flour mills for flour processing. Wheat stocks present on 1st May have been considered as final quantity of wheat present as carry-over stock. This stock has, however, been included in the next year’s net wheat availability.

The carry over stocks in Pakistan should in no case be less than 40 days consumption requirements according to my assessment. This suggestion has been given keeping in view the non-availability of appropriate storage facilities in Pakistan and lack of awareness of farming communities with modern storage technology (Table 1).

Wheat situation in neighbouring countries of Pakistan

Pakistan has common boarders with countries like Afghanistan, Iran, India, and China. Since food shortage is a global problem, the food short-fall in any country is likely to affect the other countries particularly those in her neighbourhood.

India, whose population exceeds one billion, is also one of the largest wheat importing countries of the world, like Brazil, Japan, Egypt and European Union. Besides Gulf States such as U.A.E., Qater, Kawait and Saudi Arabia also import large quantities of wheat to meet their needs. India produces 72 mmt of wheat and has to import more than 6mmt of wheat to meet her needs.

China with a population of 1.32 billion produced 103.5 mmt during 2006-07, which was 6% less than that of the last year production. Iran produces about 11mmt of wheat and imports 5.6 mmt to meet her needs.

Chabot and Dorosch (2006) stated that Afghanistan from 2002 to 2004, imported 600 thousand tons of wheat flour per year from Pakistan through formal and informal channels. Prime Minister of Pakistan sanctioned export of 50,000 tonnes of wheat to Afghanistan to avoid food crisis in the war-torn country (Nawai-waqat, May 6, 2008). It would be in addition to 600,000 tonnes regular annual export to Afghanistan, a statement from Prime Minister Office. The illegal export of wheat flour from Pakistan has recently risen due to surge in its price in Afghanistan by 70% over the last one year.

Smuggling of wheat flour and grain

The first and foremost step which should receive top most priority is to stop smuggling of wheat grain and flour to other countries. Even wheat movement within districts should be restricted. Wheat milling should be according to the need of the area. Some influential persons have established flour mills and the milling capacity is much more than need of the area. The policy of issuing milling licence to flour mills should be reviewed by the Govt.

According to Siddiqui (2008) as much as 1800 mmt of wheat flour is being smuggled to Afghanistan every month through tribal areas. The Federal Food Minister and C.M., NWFP, should call Tribal Jirgas to apprise them of the seriousness of the issue. The statement made by one of the respected Senators shows that he was not aware of the ground realities and the magnitude of wheat and wheat flour smuggling to neighbouring countries through informal channels and its impact on our own people. The issue, no doubt is very critical but the Government have to tackle it very wisely and politically. According to Chabot and Dorosch (2006) flour export to Afghanistan continued in 2004 in spite of movement restrictions on wheat in Punjab province to facilitate Govt's wheat procurement programme.

Support price of wheat

It is usual practice that Govt. of Pakistan announces minimum support price of wheat before or at the time of sowing the crop. The data show that over the base year (1990-91) the increase in support price has been to the tune of 458% against an increase of 51.7% in wheat production. It is about 9 times less than increase in support price. The data show no significant relationship between increase in the support price and increase in wheat production as such it is not a reliable and long lasting strategy (Fig. 3, Table 1). However it should match with crops competing with wheat in economic return.

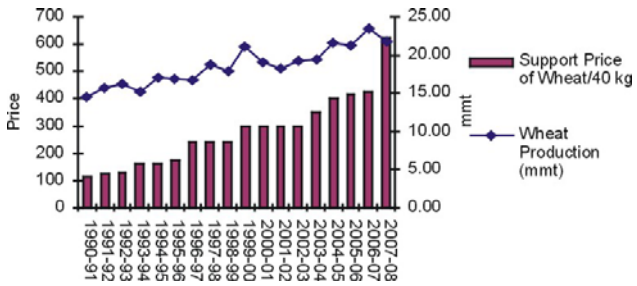

Fig. 3. Wheat production and support price of wheat per 40kg

The Govt. have to provide billions of rupees subsidy on wheat import every year. This amount of subsidy, if diverted to the farmers through well-thought and well-planned packages such as supply of fertilizer and other in-puts on subsidized rate, can help in solving food grain short-falls problem. The problems that mainly stand in the way of enhancing wheat production include high cost of electricity and diesel to run the tube wells to overcome irrigational water shortage, in-time availability of fertilizer and herbicides at affordable prices.

Subsidy on Agricultural inputs

One of our neighbouring countries provides subsidy to the farmers to the tune of five thousand karor of rupees on fertilizer alone. (S.A.Chaudhry, April 12, 2008). In the Indian Punjab, the farmers are given electricity connection for agricultural purposes on priority basis and at a very cheap flat rate of Rs. 110 per one horse power of motor engine. We cannot afford to ignore our farmers who, in-fact, are the back bone of our country's economy.

Future strategies

1) Enhancing wheat production

Hidden hunger is more pronounced in Pakistan than what macro-picture presents (WFP, 2003). The overall

food situation as already discussed, shows an annual short-fall of about 2-4mmt of wheat. The challenge is really great but not at all insurmountable. Pakistan has great potential for enhancing food grain production, not only to attain self-sufficiency but also to be able to export to neighbouring food deficient countries.

In Pakistan, more than 8 million hectares is lying as culturable waste which can be brought under cultivation provided water supply is ensured (S.A.Chaudhry, 2008). *Construction of one big dam particularly kalabagh dam can enable us to bring as many as 24 lac acres more under cultivation and that too in all the four provinces of Pakistan, making them self reliant in food productions individually as well as collectively beside getting rid of power shortage by producing 3600 mega watts of electricity at the lowest possible cost.*

In case the construction of this dam is made a political issue by creating feeling of provincialism, our future generations are likely to face not only food famin but also a serious shortage of dirking water and enemy of Pakistan, will be able to make Pakistan a desert by diverting natural flow of rivers of Pakistan towards his country.

It may, however, be pointed out that time at our disposal is very short. If immediate steps in the right direction are not taken, we are likely to face serious crises in the future. The ruling party has practically gone against its basic manifesto of *"Roti, kapra, Makan"* by refusing to undertake a feasible project of irrigational water supply and cheapest source of power generation. As a result Pakistan is likely to become an acutely food insecure country in the very near future. The previous Government liberally allowed exodus of wheat through regular and irregular channels and the present regime does not appear to bring a strategic change in its policy. According to Dr. Isfahani (2008), it is the need of the hour that the Pakistan Government should start working on war footings regarding extending crop maximization plans to balance food price inflation and improvement of storage and harvesting, threshing to control wastage of food. The Govt. needs to understand that easy and cheap food availability, access and deliverance to every one at every place is the key to their survival.

2) Increasing per hectare yield of wheat

Currently there is big gap in wheat productivity and national average. Bridging the gap can help augment wheat productivity that in turn can help realize the goal of attaining food security. For this purpose we will have to increase production and distribution of certified seed, arrange timely supply of fertilizer and herbicide at affordable prices through subsidy particularly in case of fertilizer, provide credit facilities to small farmers in the form of agriculture inputs, in-time sowing of crop before November 30, by regulating sugarcane crushing and timely cotton picking, using optimum seed rate according to the time of sowing. Irrigation water supply, of course, having pivotal role in achieving food security. Evolving high yielding short duration varieties suitable for rice-wheat, cotton-wheat, and sugarcane-wheat crop rotations for getting optimum yield.

3) Reducing post production losses

Reducing post production losses by 5% would mean saving more than one million tons of wheat for consumption besides maintaining the quality of the produce. Containment of these losses can be achieved by creating awareness among the general public particularly in the rural communities with regard to basic strategies for sound grain storage management on small farms, making farm granaries and containers water proof, rodent proof and weather proof, storing clean grains only, strictly observing storage hygiene, reducing initial moisture content of grain to the level of 10-12% and during storage keeping the grain cool and protecting from large scale changes of out-door temperature, avoiding direct sun light effects on grains, controlling insect infestation and fungal infection and regularly inspecting grain for unsafe storage conditions and pest infestation, etc.

4) The role of University of Agriculture, Faisalabad

The University of Agriculture, Faisalabad, has the primary responsibility in finding solution of the food insecurity in Pakistan, providing guidance to the policy makers and the planners and creating awareness among the rural communities as well as the employees of food handling agencies.

In the early nineties of the last century, the University of Agriculture, Faisalabad took a lead in creating a facility under the title "Grain Storage Research and Training Cell" in the Department of Entomology. A coordinated team approach was developed for undertaking problem-oriented research by involving the disciplines of Agri. Entomology, Plant Pathology, Crop Physiology, Agri. Economics, Farm Machinery and Power, Food Technology and Agricultural Engineering. The programme worked well up to 1994. Thereafter, it lost the cohesion and the work almost got stopped excepting a short training programme for the Army Officers only. The most probable reason was lack of interest on the part of Food Deptt. Punjab, which could not manage to spare its field staff for training inspite of the fact that originally this facility was created on the request of Secretary to Govt. of Punjab, Food Deptt.

The revival of this programme on a more elaborate scale and on more sound footings is in the national interest.

Extensive training on the principles of sound grain-storage management practices should be given to rural households particularly women folk and field workers of grain handling agencies using television and other telecommunication tools. The University of Agriculture, Faisalabad, should develop its own channel for carrying out it's out-reach programmes more effectively, not only in the field of grain storage management but also on all aspects of agriculture and animal sciences and containment of post harvest quantitative and qualitative losses.

Establishing grain Storage Management Centre/Institute with the ultimate aim of carrying out research and training on safe storage of food grain with particular emphasis on reducing avoidable post harvest quantitative and qualitative losses by imparting training to the farmers, traders and extension workers and through repair, improvement and renovation of existing storages.

An International Seminar Organized in 1994 by GSR & T at the University of Agriculture, Faisalabad adopted few resolutions for the improvement of research and out-reach programme in grain storage management at that time. Some of these resolutions have value even today and are, therefore, summarised as under.

Grain Storage Management needs to be recognized as a profession requiring constant input of knowledge and training and support from many academic disciplines. The University of Agriculture, Faisalabad can provide leadership and generate knowledge required for the improvement of grain storage in Pakistan. The University should create an atmosphere in which grain storage issues can be fully explored and creative solution could emerge from cooperative efforts with public and private sectors. Research on long term strategies for grain storage including specification of storage structures for bulk grain storage should receive attention of University faculty.

Future direction in stored grain ecosystem research and management

It would be worthwhile to explore some of the research directions for the future in the field of grain storage management.

Sinha as back as in 1995 emphasised upon:-

Developing optimum multi-disciplinary ecosystem management strategies with the aid of computer simulation modelling techniques, grain ventilation, controlled atmosphere storages including heat sterilization of inter granular air and pheromone based monitoring and control method without relying heavily on chemical pesticides.

Developing effective low cost environmentally sound pesticides.

Expert system based on meteorological, agronomic and economic and pest management data of stored grain ecosystem should be developed for use by grain storage managers.

Research on biological and other non-chemical control strategies need to be intensified.

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