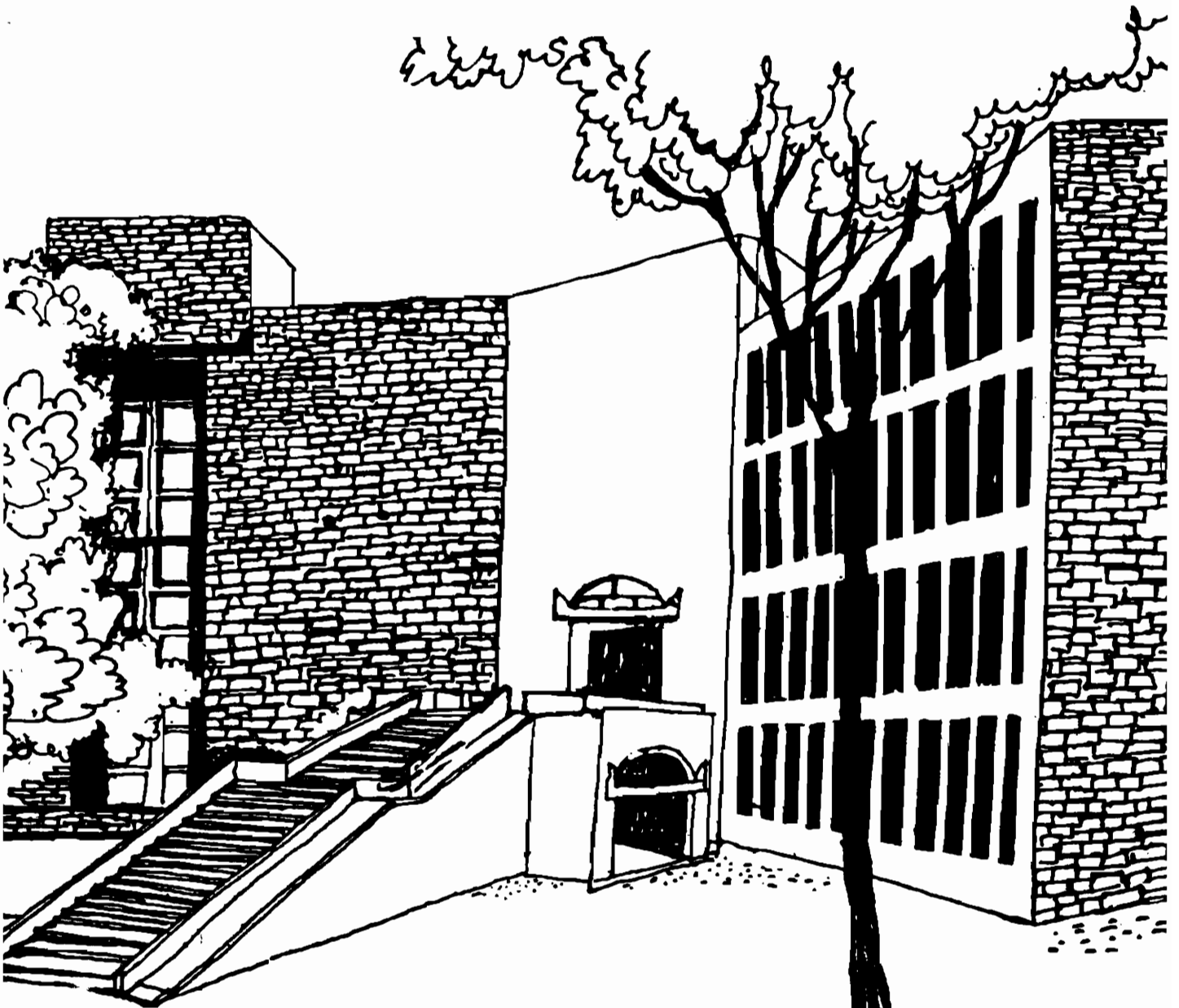




Working Paper



Seed Industry in India: An Analysis of Status

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**W.P. No. 1244
March 1995**

The main objective of the working paper series of the IIMA is to help faculty members to test out their research findings at the pre-publication stage.

WP1244
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WP
1995
(1244)



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SEED INDUSTRY IN INDIA : AN ANALYSIS OF STATUS

Gurdev Singh and S.R.Asokan

Acceleration of growth in agricultural production in developing countries to meet the increased demand for foodgrains in the coming years would depend more on enhancing productivity per unit of land than from expansion of area under cultivation. As productivity is imbibed in seed, the quality seed when combined with other complementary inputs does make substantial contribution to increased production and income to the farmers. Quality seed in most crops is the cheapest amongst all agricultural inputs required for increased production.

In traditional agriculture the cultivators retain a part of the crop produce for seed purpose. With the development of plant breeding in the early twentieth century improved crop varieties were evolved and their seed production was taken up in the organised sector, giving birth to a new industry. In India development of seed sector began only after independence.

Brief Overview

Although some attempts were made to improve the quality of seed and its distribution in the first quarter of the 20th century the efforts made were sporadic and as reported by the Royal Commission on Agriculture (1928) the impact was not significant. The Commission in its report made several recommendations to improve seed production and distribution. It underlined the need for improving multiplication and distribution of seeds and maintaining varietal purity.

Various policy initiatives were taken by the government to promote the seed activity in the post independence era. In 1957, the Indian Council of Agricultural Research (ICAR) undertook an All India Coordinated Maize Project in collaboration with Rockefeller foundation. In 1960, ICAR started similar projects for sorghum and pearl millet. The complexity of the production process involved for developing the new hybrids led to the realisation that the seed production system in vogue was inadequate. In order to put the production and processing on a scientific basis the government felt that a central seed organisation was necessary. This led to establishment of the National Seed Corporation (NSC) in 1963. The Seeds Act was passed in 1966 which came into effect in 1969 after the framing of Seed Rules in 1968. It outlined the detailed procedures for notification of new cultivars and certification of seed by autonomous organisations at state level. The certification of seeds, however, is purely voluntary under the Act.

The National Seeds Project (NSP) was launched in 1975 with the World Bank assistance. The NSP was a deliberate attempt to develop a broad-based decentralised network of seed production agencies (State Seed Corporations) with an inter-related network of cooperative and private seed producing organisations throughout the country capable of meeting the requirements of certified seed, that is, with adequate infrastructure for production, processing and storage of seeds. It was sought to be achieved with the least possible cost and disturbance. The programme was also to support or strengthen all facets of seed production from breeder/parent seed through certified seed. It was to be implemented in a phased manner. Under the NSP phases I and II seed corporations were set up in Andhra Pradesh, Bihar, Haryana, Karnataka, Maharashtra, Orissa, Punjab, Rajasthan and Uttar Pradesh to take up production and distribution in their respective state. Simultaneously the private sector was also encouraged by way of providing foundation seed of public bred varieties and concessional credit for seed activity.

The National Bureau of Plant Genetic Resources (NBPGR) was set up in 1976 to carry out and coordinate activities related to plant genetic resources. It undertakes the introduction and exchange of plant genetic resources through effective linkages with concerned organisations abroad. It also quarantines the materials exchanged. The bureau has 9 regional/base centres for collection and exploration, 6 regional stations for evaluation and 3 quarantine stations.

The eighties marked significant developments in the seed activity in the country especially in the private sector. The government initiated some bold steps to revitalise the seed sector. In 1983, the Government of India (GOI) decided to provide breeder seed of public bred cultivars to the private seed enterprises for multiplication and distribution. This was an indication of confidence of the government in the private sector which had grown over the years with well established production and processing facilities. Some private seed companies had also undertaken seed research and introduced proprietary hybrids successfully.

The year 1987 marked a major shift in government policy as it abandoned the earlier protectionist stand and allowed the MRTP and FERA companies to participate in seed activity by placing seed industry in Appendix I of the licensing policy. This was expected to usher in competition and more involvement of private sector in seed research. Following this, many Indian companies had gone in for collaborative arrangements with foreign companies in the areas of cereals, pulses, oilseeds and certain cash crops like tea and coffee (Annexure 1). In October 1988, the GOI announced a New Policy on Seed Development. The policy had placed the import of seeds and other planting material of vegetables, flowers and fruits on Open General Licence (OGL). The import of seeds of pulses, oilseeds and coarse cereals was allowed initially for two years under the agreement that the foreign company would deliver the parent lines/seed to its Indian counterpart. The New Policy had undone at least partially the expectations of the 1987 liberalisation since it was feared that it would be easier for the seed companies to import seed rather than invest in research and go through a lengthy and uncertain process for releasing the lines developed.

In March 1990 the third phase of NSP was launched with the main objectives of:

- i. reorienting the operations of the NSC and SSCs along commercial lines with the emphasis on strengthening management and ensuring autonomy in production, pricing and management decisions.
- ii. stimulating private sector investment through adequate institutional finance.
- iii. improving management of public sector variety development programme.
- iv. ensuring development of adequate facilities for seed industry regulation and quality control.

The NSP III has two components (i) project component (\$40 million) and (ii) programme component (\$110 million). Eighty per cent of the funds under project component are made available as investment credit for strengthening seed processing and storage facilities. Selectively funds are available to support R&D programmes in the private sector and breeder and foundation seed production of SSCs. The rest of the funds would be provided as grants to ICAR, SAUs, certification agencies, state agricultural departments for processing plants, and Project Monitoring Unit. The funds for investment will be channelled through NABARD as refinance to banks. Funds under the programme component are available to GOI for preparation and implementation of action plans by the NSC and SSCs. The action plans would focus on reorienting the operations of the corporations to make them financially viable and self supporting institutions.

As a result of various policy initiatives the seed industry which was virtually non-existent on the eve of independence has developed to a Rs.7500 million industry in the next few decades with three distinct subsystems viz, i) Research and Development, ii) Multiplication and iii) Marketing/distribution. Starting from a few individual small groups the seed industry has grown to more than 100 seed organisations consisting of 29 limited companies, 15 public sector corporations and the remaining partnership and other firms (Barwale 1986). With the liberalisation in the eighties many foreign companies have entered the seed scene.

Production and Requirement

Quality seed production which was just 0.18 million quintals in 1953-54 has risen to 5.3 million quintals in 1992-93 (Table 1). Though the growth seems impressive the production has been far below the requirements. The absolute annual increments are lower than the requirements computed on the basis of the area under individual crops. In other words, the gap between requirements (demand) and production of quality seed is consistently high for all crops as is evident from Table 2. The gap is more than 70 per cent in case of wheat, maize and groundnut and more than 45 per cent in case of paddy, jowar and bajra. Only in the case of bajra the gap was 20 per cent in 1986-87.

| Table 1 : Production of Certified Quality Seeds | | | | | | | |
|---|-------|-------|-------------|--------|----------|--------|-----------|
| ('000 quintals) | | | | | | | |
| Year | Wheat | Paddy | All cereals | Pulses | Oil seed | Fibres | All seeds |
| 1980-81 | 983 | 582 | 1874 | 102 | 14 | 70 | 2186 |
| 1981-82 | 910 | 653 | 2013 | 119 | 44 | 96 | 2418 |
| 1982-83 | 1570 | 674 | 2929 | 207 | 165 | 135 | 3661 |
| 1983-84 | 1729 | 888 | 3037 | 160 | 495 | 80 | 4126 |
| 1984-85 | 1860 | 1203 | 3729 | 240 | 471 | 178 | 4997 |
| 1985-86 | 1270 | 1038 | 3069 | 283 | 483 | 301 | 4484 |
| 1986-87 | 1584 | 1321 | 3821 | 448 | 619 | 225 | 5651 |
| 1987-88 | 1386 | 1383 | 3475 | 553 | 801 | 117 | 5366 |
| 1988-89 | 1354 | 1681 | 3826 | 348 | 722 | 148 | 5669 |
| 1989-90 | N.A. | N.A. | 3482 | 352 | 876 | 202 | 5704 |
| 1990-91 | N.A. | N.A. | 3441 | 354 | 869 | 220 | 5710 |
| 1991-92 | N.A. | N.A. | 3531 | 377 | 921 | 233 | 5750 |
| 1992-93 | N.A. | N.A. | 3670 | 430 | 545 | 475 | 5300 |

Source : Indian Agriculture Statistics in Brief, various years, Ministry of agriculture, Govt of India, New Delhi.

| Table 2 : Gap between Requirements and Production of Certified/Quality Seeds of Some Crops | | | | |
|--|----------------------------|------------------------|----------------------------|------------------|
| Year | Cropped area (million ha.) | Seed Req. (000 tonnes) | Seed produced (000 tonnes) | Gap (000 tonnes) |
| WHEAT (Seed Rate : 100 kg/ha.) | | | | |
| 1983-84 | 24.7 | 617 | 173 | 444 (72) |
| 1986-87 | 22.8 | 570 | 158 | 412 (72) |
| 1989-90 | 23.5 | 587 | 170 | 417 (71) |
| PADDY (Seed Rate : 30 kg/ha.) | | | | |
| 1983-84 | 41.2 | 309 | 89 | 220 (71) |
| 1986-87 | 40.8 | 306 | 132 | 174 (57) |
| 1989-90 | 42.2 | 316 | 174 | 142 (45) |
| GROUNDNUT (Seed Rate : 150 kg/ha.) | | | | |
| 1983-84 | 7.5 | 283 | 35 | 248 (88) |
| 1986-87 | 7.2 | 268 | 37 | 231 (82) |
| 1988-89 | 8.4 | 315 | 57 | 258 (82) |

| JOWAR (Seed Rate : 10 kg/ha.) | | | | |
|--|------------|----|----|---------|
| 1983-84 | 16.4 (5.3) | 90 | 14 | 76 (84) |
| 1986-87 | 15.6 (5.5) | 89 | 49 | 40 (45) |
| 1989-90 | 14.8 (6.9) | 95 | 38 | 57 (60) |
| BAJRA (Seed Rate : 4 kg/ha.) | | | | |
| 1983-84 | 11.8 (5.4) | 30 | 15 | 12 (44) |
| 1986-87 | 11.2 (5.2) | 29 | 23 | 6 (20) |
| 1989-90 | 10.9 (5.6) | 29 | 14 | 15 (52) |
| MAIZE (Seed Rate : 20 kg/ha.) | | | | |
| 1983-84 | 5.8 (1.9) | 64 | 11 | 53 (83) |
| 1986-87 | 5.8 (2.2) | 68 | 15 | 53 (78) |
| 1989-90 | 5.9 (2.3) | 70 | 18 | 52 (74) |
| <ol style="list-style-type: none"> 1. Figures in brackets for <u>jowar</u>, <u>bajra</u>, <u>maize</u> indicate area under hybrids. 2. Figures in brackets in column 5 indicate percentages. 3. Replacement schedule of three years for <u>bajra</u>, <u>jowar</u> and <u>maize</u>, and four years for other crops are considered. | | | | |

Ironically while the seed production is lower than the requirements, some seed enterprises have been facing the problem of carryover of unsold seeds almost every year. This situation might have arisen due to (i) lack of planning, (ii) poor marketing and (iii) delayed seed replacement decisions by the farmers. Ideally seed should be replaced every year for hybrids and every three or four years for non-hybrids (NCA 1976). However, seed is replaced less often especially in case of open pollinated crops.

The Expert Group on Seeds (1989) computed the seed replacement rate (SRR) for major crops for Seventh Plan (Table 3) and found that for almost all major crops the SRR was not at all close to the recommended. Only in case of bajra the replacement rate has already exceeded the target for 2000 AD because of success of bajra hybrid under both irrigated and dry situations. Though the targets of seed replacement in case of wheat and groundnut are only moderate, the achievements are dismal. The low SRR other major cereals has resulted in low demand for quality seed and hence unsold stock of some seeds. The low SRR affects the public sector seed corporations (NSC and SSCs) more as their production portfolio consist mainly of high volume low value non-hybrid cereal crops (Gurdev Singh, et.al. 1990).

The problem of low SRR is prevalent in all the states (Table 4). However, the states where a crop is relatively new or where seed could not be locally produced conveniently the replacement rate is higher. The point is better illustrated by the replacement rates of wheat seed in Punjab vs. Assam and West Bengal. In Punjab the replacement rate for wheat was just 1.2 per cent in 1988-89 compared to 96.35 per cent in Assam and 25 per cent in West Bengal.

The major reason for low replacement is lack of awareness among the farmers about the correct replacement schedule for different seeds (Gurdev Singh and Asokan, 1994). However, the crop produce (own or aquired from fellow farmers) used as seed may not necessarily be of substandard in quality. The lateral exchange of seed among the farmers helps in diffusing new varieties faster. This prompted the Expert Group on seeds to suggest, "in order to increase the SRR in short period of time foundation seed of self pollinated crops such as paddy, wheat, etc., may be distributed to progressive farmers in chosen villages. The farmers may be trained by extension organisation in roguing, weeding, avoiding mechanical admixture, etc." Other farmers can buy seed from the progressive farmers in the subsequent years. The group further states "These seeds need not be offered for certification nor will there be any control on its price." This, the group felt would help to ensure quicker replacement of seed by the farmers.

| Table 3 : Targets and Achievements of Seed Replacement Rate | | | | |
|--|-------------------------|--------------|-------------|---------------------|
| (Per cent) | | | | |
| Crop | Renewal period (Years) | Seventh Plan | | Targets for 2000 AD |
| | | Targets | Achievement | |
| Paddy | 4 | 10 | 11.09 | 20 |
| Wheat | 4 | 10 | 6.34 | 15 |
| Jowar | i.Improved ii.Hybrid | 3 1 | 10 100 | 14.59 |
| Maize | i.Improved ii.Hybrid | 3 1 | 10 100 | 13.90 |
| Bajra | i.Improved ii.Hybrid | 3 1 | 10 100 | 42.07 |
| Groundnut | 3 | 10 | 8.44 | 15 |
| Cotton | i.Improved ii.Hybrid | 4 1 | 10 100 | 9.71 |
| Source : GOI, Expert Group on Seeds, 1989. GOI, National Commission on Agriculture, 1976. | | | | |

| Table 4 : Statewise Seed Replacement for Certified/Quality Seed during 1988-89 | | | | |
|---|-------------|--------------|--------------|--------------|
| (Per cent) | | | | |
| State | Wheat | Paddy | Sorghum | Bajra |
| Andhra Pradesh | 17.41 | 21.75 | 32.00 | 43.00 |
| Assam | 96.35 | 9.28 | -- | -- |
| Bihar | 4.82 | 4.74 | -- | -- |
| Gujarat | 10.03 | 10.02 | -- | -- |
| Haryana | 5.95 | 8.06 | -- | 39.11 |
| Himachal Pradesh | 22.00 | 9.00 | -- | -- |
| Jammu & Kashmir | 11.38 | 5.23 | -- | -- |
| Karnataka | 10.00 | 18.00 | -- | -- |
| Kerala | -- | 10.00 | -- | -- |
| Madhya Pradesh | 2.03 | 3.10 | 11.12 | 19.19 |
| Maharashtra | 5.85 | 1.59 | 55.00 | 55.00 |
| Orissa | 15.00 | 2.01 | -- | -- |
| Punjab | 1.20 | 5.07 | -- | -- |
| Rajasthan | 4.58 | 3.67 | 4.00 | 26.77 |
| Tamilnadu | -- | 14.00 | 9.00 | 25.00 |
| Utar Pradesh | 3.24 | 7.58 | 0.22 | 3.51 |
| West Bengal | 25.00 | 14.00 | -- | -- |
| All India | 6.34 | 11.09 | 14.59 | 42.07 |
| Source : GOI, Expert Group on Seeds, 1989. | | | | |

Research and Development

Seed research in India is primarily confined to public sector like the Central Research Institutes and State Agricultural Universities (SAU). There are in all 39 central research institutes of which 15 are actively involved in research related to crop production and protection including plant breeding. Some of this work is carried out under the directions of All India Coordinated Crop Improvement Project (AICCIP). More than 2000 cultivars developed by public institutes have been released and notified (Agrawal, 1988).

There are 27 state agricultural universities. These follow the principle of integrating agricultural research, education and extension training. They are autonomous organisations catering to the research needs of different regions in which they are located but centrally assisted through the ICAR. They also participate in the AICCIP.

The research is carried out under two types of projects, namely, AICCIP and ad hoc research projects. There are 32 AICCIP under which multi-disciplinary problem solving research on seed on national basis is carried out for all major crops.

The objective of the AICCIP is to evolve high yielding fertiliser responsive varieties of crops with in-built resistance to some of the important pests and diseases that affect them. A number of main centres and sub-centres are located in different agro-ecological regions of the country. The main centres take up research relating to development of new varieties and standardise package of practices for them, while sub-centres conduct performance trials in different locations for a minimum period of three years/seasons. The new varieties are first tested for yield under the initial yield evaluation trials (IVT); the promising ones are promoted to the preliminary varietal trials (PVT) in the second year/season. After screening at the PVT, they are promoted to the uniform varietal trials (UVT) in the third year/season.

In addition, a number of ad hoc research projects are financed separately out of ICAR's Agricultural Cess Fund. They are particularly useful for providing supplementary information on crops which though covered under the coordinated projects have problems not otherwise being tackled. There were 100 such ad hoc projects of which about 17 were related to seed problems.

Apart from close linkages with several government departments, SAUs and other scientific organisations ICAR has collaborative research programmes with International Crop Institutes and agencies like ICRISAT, IRRI, ICARDA, IDRC, GGIAR, FAO, UNDP, UNESCO, SAREC, etc. involved in research and development (Randhawa 1993).

Private sector seed research

Private sector is generally conservative towards research. Their research activities are concentrated mainly on hybrids of millets and cotton. Of late oilseeds (sunflower) are getting increasing attention besides vegetables. The private sector has developed some 122 cultivars of different crops as shown alongside (Agrawal, 1988). Nearly 70 percent of these are hybrids (ibid). These cultivars have been overwhelmingly accepted by the farming community is the testimony to the ability of the private sector in developing good quality seed. With the emergence of biotechnology the private sector sees a promising and brighter future in seeds and many companies have started investing in biotechnology. About Rs.100 crores have already been invested in the field by private sector (India Today 1991).

| | |
|------------|-----|
| Vegetables | 55 |
| Millets | 39 |
| Cotton | 13 |
| Fodder | 04 |
| Oilseeds | 09 |
| Pulses | 02 |
| | 122 |

Intellectual Property Rights

The Indian Patents Act of 1970 excluded all living organisms from the scope of patentability. It also excludes product patents of all substances intended for use or capable of being used as food or as medicines or drugs. As far as processes are concerned i) a method of agriculture or horticulture and ii) any process for the medicinal, surgical, curative, prophylactic or other treatment of human beings or any process for a similar treatment of animals or plants to render them free of disease or to increase their economic value or that of their products are not patentable.

The Trade Related Intellectual Property Rights (TRIPs) agreement negotiated under GATT stipulates that inventions in all branches of technology whether products or processes shall be patentable provided they are new involving an inventive step and are capable of industrial application. The member countries are required to develop a new system to protect plant varieties by patents or by an effective sui generis system or any combination of thereof.

Along with GATT agreement the entry of multinationals increased the clamour for protection of plant varieties. The domestic seed companies also joined the fray in demanding protection. The Second Seed Seminar (1989) on Plant Variety Protection Pros and Cons felt that the "time is ripe for introducing Plant Breeders Rights (PBRs) in India in order to further strengthen crop improvement research and to provide better quality seeds to farmers." The absence of Plant Variety Protection is said to be a disincentive for seed companies to do research on varieties. "Due to enormous expenditure involved in R and D and extension to popularize new HYV/hybrids among Indian farmers and in the absence of any protection the private breeding was limited to vegetables, flowers and a few other crops" (Sinha 1989). However, a study on the Impact of Plant Variety Protection Act 1997 in U.S. found that investment by private companies increased only in Soybeans and Wheat, not in other open pollinated crops (Butler and Marion 1983). Private agricultural research investment has been spread unevenly among crops with Soybeans receiving the greatest attention. Minor crops, including several vegetables, have received no investment at all (Lesser 1990).

The Government of India has prepared a draft legislation on plant varieties protection. The Act will be known as the Plant Varieties Act (PVA) 1993. It is yet to be introduced in the parliament.

Multiplication

Seed multiplication is carried out in the decentralised manner through contract growers. The companies/corporations enter into an agreement with the farmers regarding procurement of quality seed, compensation rate and terms of payment, cultural practices to be followed and services rendered to ensure quality seed production. To coordinate production on large number of grower farms coordinators or organisers are employed on commission basis. The organisers normally are progressive farmers or other influential individuals in the locality. They carry out certain functions for the enterprise. While ideally multiplication of seed should be in compact area, in a country like India where the holdings are small it is not possible to get large compact areas for this purpose. The alternative is "to get hold of one village and persuade everyone to take to seed production." (Swaminathan, 1986). However, there are many practical difficulties in developing seed villages (Seed Review Team 1968). Nevertheless, some seed enterprises have successfully adopted this approach for effective monitoring and isolation.

The private seed companies concentrate more on hybrids and high value vegetable crops and shy away from self pollinated crops. Thus, the onus falls on the public sector corporations to produce those seeds. Further, the location of the seed corporation dictates its production portfolio and hence determines its profitability. For example the portfolio of Punjab State Seed Corporation is predominantly paddy and wheat (low profitability) whereas Maharashtra State Seed Corporation has high profitability portfolio of commercial crops (Gurdev Singh et al 1990).

The seed multiplication agencies have to undertake the seed activity well in advance. It is one year advance planning for foundation seed production and two years advance planning for breeder seeds to arrange for certified or truthfully labelled seed production at specific times. It is quite difficult to plan production to match demand for any seed because this demand changes with marginal changes in weather during sowing season which for any crop variety is only a few days. While in case of fall in demand excess production is carried over to the next season(year), under the circumstances of spurt in demand some companies try to corner (as much as they can) the available good seed by offering higher price (to the producer farmers) than the contracted price. This practice is quite common. Though legal action against the defaulter producers can be initiated the companies do not consider it worth the time and money for small quantity of seed involved in individual cases.

Most of the private companies do not make any payment to the farmer producers at the time of delivery of seeds. It is only after processing and successful completion of germination tests the final payment is made on the basis of net weight of certified seed. It takes four to six months from harvesting to final payment.

In case of public agencies for open pollinated cereals 80 percent of the agreed price and in case of hybrids 80 per cent of the grain price are paid on delivery of seed at the processing plant. The balance is paid after successful completion of germination and purity tests. However, the producers have to wait for four to six months for payment in the case of non-cereals.

Deferred payment to the farmers during the peak season helps the companies to tide over their working capital problems. In fact, deferred payment to the farmers constitutes the major portion of working capital for many seed companies (Gurdev Singh, et al 1990). In other words, farmers financed at least partially the market channel for four to six months.

While seed production activity does not require additional investment by the farmer growers, it require more working capital as cost of production of seed crop is higher than the grain crop. However, crop loans are available on scales fixed for grain crops. To quote NSP I, "working capital needs for seed production of self pollinated crops are only 15 to 20 per cent higher than those for commercial cultivation. However, for hybrid seed cultivation, where working capital needs increase by 50 to 70 percent a problem does exist, since the loan limit for seed production often tends to be significantly higher than crop production." Though a seasonal credit fund to meet the additional cost of cultivation is proposed under the NSP not much headway was made in this direction.

Seed production like any other crop is prone to losses due to adverse weather, pest attack etc. Since cost of cultivation of seed crop is much higher, its failure might result in the bankruptcy of the producer. The National Commission (1976) advocated crop insurance for seed production. More recently the Seventh Plan echoed the point and stated that for ensuing adequate supply of seeds, seed producers should be covered under the Comprehensive Crop Insurance Scheme. So far no initiative was taken in this direction.

Marketing of Seeds

Marketing of seed is the most important as well as challenging aspect of seed industry because of nature of the product. Seed being a live organism, its quality deteriorates faster. Thus its shelf life is limited and it must be marketed within the season. Left over stocks carried to the next season lose vitality and germination percentage goes down many a time to unacceptable level. Because seed is treated with fungicides it is not fit for consumption either by human beings or by animals. Hence, it would not be possible to salvage even grain value of seed.

Another important feature of this input is the need for advance production planning i.e., to meet the demand for particular seed, its production has to be organised at least two years in advance. The changes in weather, price of the crop, prices of competing crop may change the prospects of demand

for a seed at the commencement of sowing season. In times of increase in demand for seed, its supply cannot be increased as production cannot be organised immediately whereas fall in demand would result in carryover of stocks. Such uncertainties in demand for seed makes its pricing a complicated exercise.

After production the seed is processed and made available at the nearest point to the farmer in remote villages well in advance of sowing time, in good quality and adequate quantity, and at affordable price. This warrants in addition to adequate production an effective delivery system.

Existing delivery system

Seed is marketed through a network of distributors and dealers by the private seed companies as well as public sector corporations. A distributor/stockist is generally appointed for a region which may consist of one or more states. However, in some areas the companies reserve the right to appoint more than one distributor in a state depending upon the potential of the state. The dealers are normally appointed at district level. In some districts there may be more than one dealer again depending upon the potential of the district and marketing strategy of the seed agency. Generally they are appointed on non-exclusive basis which means the dealers can deal in products of other companies.

Seed demand is seasonal and for a particular seed it lasts only for 3 to 4 weeks in a season. Hence seed forms only a part of the overall business of a dealer. Many a times the seed dealers also deal in other agricultural inputs such as fertilisers, pesticides etc. The retailers combine seed business not only with other agricultural inputs but with other commodities as well. The distributors, dealers and retailers are paid commission by the companies on sales. Normally 15 to 20 per cent commission is given to distributors who pass 12 to 17 per cent on to the dealers while the retailers get 9 to 14 per cent gross discount on sales. In some cases the companies directly deal with the dealers who are paid commission at par with the distributors.

The distributor/dealer indent seed with the companies well in advance, that is, for the ensuing kharif season orders have to be placed in December. The companies insist on full payment on delivery of stocks. However, depending upon the track record of the distributor/dealer credit is allowed for a maximum period of 30 days. The companies give incentive discount to the distributor/dealer against advance booking of seed with cash payment either in part or full. The incentive discount is normally equivalent to market rate of interest on call money. The advantages of advance booking against cash are that it ensures sales and reserves shelf space for the company and ensures supplies to the distributors/dealers. However, once seed is lifted from the company's godown it becomes the property of the channel and the carryover stock at the end of the season remains with the dealers/distributors. The company on request helps in revalidation of the seed by the certification agency at the dealers'/distributors' cost. However, some companies have the policy of getting back the unsold stocks so that they are not sold as fresh stocks in the subsequent season by the channel which might damage the image of the company among the farmers. The companies also may have their own retail sale points at the office premises at headquarters and at regional level and in some cases at specific locations.

The National Seed Project (NSP) aimed at creating at least 4 sales points of seed per block which means creating a network of minimum 20,000 sale points for the 5000 community development blocks. While creating such a marketing network great emphasis was to be given to cooperative channel. Accordingly, the state seed corporations (SSCs) besides creating a network of dealers/distributors also marketed seed through cooperative marketing federations and agro-industries corporations of the concerned states. Some of the SSCs market three-fourths of their seed through this channel. However, SSCs find the cooperative channel ineffective as they lack aggressive selling techniques like the private dealers. SSCs have to retain the channel at the insistence of the state governments.

The NSP expected the National Seed Corporation (NSC) to gradually stop production of seed and start coordinating the production of seed by SSCs, and concentrate on inter-state marketing of seed produced by SSCs "supplying for instance, wheat to West Bengal from all the wheat producing SSCs so as to give the farmer as wide a choice as possible, as well as seeds of other crops from other states, through a single network of dealers for example jute from Maharashtra, maize from Andhra Pradesh, Potatoes from U.P. and Punjab and so on." However, NSC could not succeed in coordinating inter-state marketing of seeds from SSCs. Being producer itself it was often in competition with them.

Other aspects

As we know seed is a live organism and is subject to deterioration in quality if not handled properly. It is thus pertinent to ensure sales in the first season itself. The objective of the company is to minimise the carry over stock and maximise sales.

Most of the companies/corporations multiply and sell public bred varieties where there is hardly any product differentiation possible. Only few companies have their own research and have developed lines with some distinct qualities. When product differentiation is not possible promoting company's brand name becomes important rather than promoting the product (Barwale 1992). So brand image of the company is the focus in sales management.

The distributors/dealers have overall cash credit limit for their business. Seed is a seasonal business and peak time requirement for funds is high. The cash credit limits sanctioned for distributors and dealers for their total business are often inadequate. So the dealer/distributor have to resort to market borrowing at high rate of interest (Gurdev Singh et al., 1990). The financial institutions should consider favourably additional cash credit limits for the seed marketing season to help ease the transactions between companies and the channel.

The distributors/dealers do not stick to the price by the company and do not operate at 10 to 15 per cent margin provided to them. The demand and supply situations are fully exploited by them (ibid). If there are shortages price hike is not uncommon. Since the entire seed is sold within two weeks or so distributors and dealers sometimes create an artificial scarcity. Further the distributors generally do not pass on the prescribed share in commission to dealers as they are aware that the latter would get adequate margin by hiking the price. These problems can be, to a large extent, avoided if the companies appoint the distributors for longer period of say five years or more than the present system of one or two seasons. Such practices would enable the companies to get feedback on the product on a regular basis.

Exports

The value of global seed exports was 1.23 billion U.S. dollars in 1989 of which India's share was 2.8 million dollars. It amounts to just 0.23 percent, a woefully low figure for a country of India's size. Table 5 shows seed exports by India over the years. During 1990-91 India exported seed worth Rs 9.53 crores. Vegetables seed constituted a major share of exports in terms of volume and value however, its share declined of late with regard to volume of seed exports. In 1990-91 64.2 percent of the seed exported constituted only forage crops. Being high volume seed it accounted for only 8.5 per cent of the exports earnings. Peas seeds emerged prominent in India's seed exports in recent years.

The main reason for the pathetic state of affairs is that there is no coherent government policy on export of seeds. Generally speaking, seed export is discouraged. Domestic requirements are given priority over demand from foreign countries. Export of breeder and foundation seeds as also of certified seeds of pulses and oilseeds is banned. Requests for supply of certified seeds of cereals is examined on individual basis on merit. Subject to exigencies of domestic requirements exports sometimes are allowed in the interest of international relations. (Govt of India, 1990).

India has distinct advantage over other countries for producing seeds as it has i) varying agro-climatic zones which is uniquely suited for producing large number of varieties and hybrids ii) a vast pool of high calibre agricultural scientists and iii) cheap agricultural labour. However, this potential is hardly exploited to carve a niche for India in the world trade on seeds.

Further, there is enormous scope for custom production of seeds by the Indian companies for foreign clients (NSP I). There is no proper government policy or guidelines on custom production of seeds by the private sector seed companies and hence this potential is not exploited. Few seed companies which attempted custom production had to undergo lot of difficulties due to complex procedures which caused delays and additional cost to the exporters.

In the last decade or so seed production of many crops has shifted from North America to countries like Mexico, Thailand, Indonesia, Philippines, etc (Barwale 1992). Unless the official policy regarding seed export is streamlined India may not withstand the tough competition from these countries in the exports of seeds.

Small countries like Hong Kong and South Korea are exporting large quantities of seed. Hong Kong imported 11 million dollar worth of seed in 1989 and exported seeds worth 21.4 million dollars which indicates perhaps Hong Kong is trading in seed may be, by making some value addition to imports. There is no reason why India should not identify different markets and cater to them.

| Table 5 : Export of Seeds by India | | | | |
|---|---------------|--------------|---------------|--------------|
| Quantity in tonnes; Value in Rs.'000 | | | | |
| Seeds of | 1986-87 | | 1990-91 | |
| | Quantity | Value | Quantity | Value |
| Forage plants | 1.6 | 0.06 | 4140 | 8.13 |
| Herbaceous plants | -- | -- | 0.6 | 0.40 |
| Peas | -- | -- | 1292 | 13.57 |
| Vegetables | 429.5 | 7.12 | 555.8 | 36.80 |
| Fruits | 4 | 0.24 | 23 | 1.51 |
| Other crops | 593 | 12.51 | 436 | 34.92 |
| Total | 1028.1 | 19.93 | 6447.4 | 95.33 |

Source : Monthly Statistics of Foreign Trade of India, Exports & Re-exports, Director General of Commercial Intelligence & Statistics, Ministry of Commerce, Govt. of India, (various issues).

If India wants to have a niche in the world seed market it must have a comprehensive long term policy on seed exports. First, India's strength in different seeds needs to be analysed and a carefully thought out long term policy formulated to avoid confusion and ad hoc decisions like banning of exports. This is important as reliability of supply is of utmost importance in the stiff international competition (Swaminathan 1986). The global seed market should be carefully examined to find markets for India's seeds. Although Netherlands, USA and France accounted for 50 per cent of world export of seeds they as well accounted for 30 per cent of imports worth 396 million US dollars in 1989. If India could cater at least to some extent to these three countries alone it would greatly enhance India's export performance on seed.

Sum Up

Seed industry in India had made great strides since independence. The government through its policy initiatives helped the growth of the nascent industry. Although the growth of the industry in the past several decades is impressive it is well short of the potential. The demand for foodgrains for the year 2000 is estimated at 225.1 million tonnes (NCA) i.e. an increase of 28 per cent in the next five years.

Besides, the demand for edible oils, pulses, etc., is going to increase substantially. Increase in production would depend largely upon increase in productivity rather than expansion of area under cultivation. Quality seed plays a crucial role in increasing productivity. However, seed production in the country is well below the requirement. At the same time seed companies are facing the problem of unsold stocks almost every year may be due low replacement demand for seeds. Seed is replaced less often than the recommended rate. The problem is prevalent in all states for all major crops. Seed multiplication is carried out by the seed agencies under contract with farmers. However, the farmers have to wait for four to six months for payment. In the absence of institutional finance for seed production there is little incentive for farmers to take up the activity. Research in developing new cultivars are confined to public sector institutes like the Central Research Institutes and State Agricultural universities. Though the trend is changing in recent years as more and more private companies started investing research they concentrate only on hybrids and vegetables which are high value and whose demand is fairly certain. So in future also the public sector institutes have a crucial role to play in cereals crops. Seed marketing is different from conventional marketing of other products as seed is a live organism which should be sold within the season. Further, estimating demand for a particular crop is extremely difficult as demand is influenced by various extraneous factors. Though India has distinct advantages for exporting seed the potential is hardly exploited. The problems of the industry needs to be rectified to meet the challenges of the future.

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| Annexure 1 | | | | | |
|---|--|--------------|--|--------------|------|
| Details of Foreign Collaboration in Respect of Seed and Planting Material | | | | | |
| Indian Company | Foreign Company | Country | Product/activity | Type | Year |
| Cargill Seeds India | Cargill | USA | Hybrid Seeds | Fin | 1986 |
| Sandoz India | Zaadunio | Holl | HYV of seed, etc. | Tech | 1987 |
| Sandoz India | Northrup King | USA | HY seeds plantlets | Tech | 1987 |
| ITC Agrotech | Continental Grains | Australia | Hybrid seeds | Tech | 1988 |
| Bejo Sheetal Seeds | Bezo Zadan | Holland | Hybrid Seeds | Fin | 1988 |
| PHI Biogene | Pioneer Overseas Corpn. | USA | Hybrid Seeds | Fin | 1988 |
| Bihar Seeds Corpn. | Pacific Seeds | Australia | Hybrid Sunflower | Tech | 1988 |
| Nath Seeds | Dobi Gon & Co. | USA | Hybrid Sunflower | Tech | 1988 |
| Welcome Seeds | NRI Cases India/U.K. | U.K. | Vegetable Seeds | Fin | 1989 |
| Bilt Treetech | Plantex | Aust | Propagating of trees, shrubs, ornamental flowers | Tech | 1989 |
| Omega Agseed India | Agseeds | Australia | Improved Variety of seeds | Fin | 1990 |
| Bharat Pulverising Mills | Nova Seeds | USA | Oilseeds, pulses & vegetable seeds | Fin | 1990 |
| Bisco Seed Tech.P.Ltd. | Agripro Bio Sciences | USA | Hybrid Seeds | Tech | 1990 |
| Nath Seeds Ltd. | K.Z. Gebroaders | Holland | Hybrid vegetable seeds | Fin | 1990 |
| Maharashtra Hybrid Seed | Asgrow Seeds | USA | Hybrid vegetable seeds | Tech | 1990 |
| ECL Agrotech | Controcoop. | Yugoslavia | Hybrid Seed | Tech | 1990 |
| Harrisons Malayalam | Agri Saatan | West Germany | Hybrid/HYV of vegetable | Tech | 1991 |
| Harrisons Malayalam | Semynio Szatzucht | West Germany | Hybrids/HYV seeds of field crops | Tech | 1991 |
| Harrisons Malayalam | Green Tek/ Cultiss (yet to be approved by SIA) | Holland | Tissue Culture | Tech | |
| Intercorp Inds. | Rustica Semences | France | Hybrid Seeds | Tech | 1992 |
| Raunaq International | Centrocoop and Instt. of Field and Vegetables Crops Faculty; Uni. of Agri. Novisat | Yugoslavia | Hybrid seeds | Fin/ Tech | 1992 |
| SPIC | Pioneer Overseas Corpn. | USA | Hybrid seeds | Fin | 1993 |
| Proago-PGS India | Plant Genetic Systems International NV | Belgium | Hybrid of oilseeds and vegetable | Tech/ Fin | 1993 |
| Micro Planate | Kemira OY | Finland | Hybrid and synthetic seeds | Tech | 1993 |
| Pioneer Overseas Corpn. | Pioneer Overseas Corpn. | USA | 100% owned Research Co. on hybrid seeds | | 1993 |

Source: National Conference on Seeds, 1993. Agenda papers, Annexure V. pp 39-41
 Pandey (1994), p. 10