Fertilizer Quality Control in India
The need for a systemic change

Occasional Paper Series | Issue 1 2011

Fertilizer Quality Control in India
The need for a systemic change*

* A FISME- Indicus Analytics Report

Fertilizer Quality Control in India: The need for a systemic change

Published by:

Federation of Indian Micro and Small & Medium Enterprises
B-4/161, Safdarjung Enclave, New Delhi – 110 029
Tel No : 011 - 46023157, 46018592, 26187948, 26712064
Fax No : 011 - 26109470
Email : info@fisme.org.in
Website : www.fisme.org.in

First Edition: April, 2011

Acknowledgements

The paper 'Fertilizer Quality Control in India: The need for a systemic change' is authored by Dr. Sumita Kale and Dr. Laveesh Bhandari of Indicus Analytics- a premier economics research firm in India. The paper has extensively used the data collected by FISME over a period of time through RTI applications. In compilation of the report among those who contributed significantly include Ms. Deepa Nayak and Mr. S.K. Pathak whose contribution is gratefully acknowledged.

Table of Contents

Foreword

By Bibek Debroy*

Why do farmers commit suicides? There are several reasons. But at least one has been commercialization and diversification. These, almost tautologically, mean greater exposure to risk. However, risk-mitigation instruments aren't allowed to develop. This is symptomatic of confusion in policy mindsets. Several items can be left to the market. There aren't necessarily market-failures. However, entry barriers that impede private sector entry need to be removed and simultaneously, government has to perform a regulatory function. Regulation isn't the same as control. Nor is regulation the same as passing laws (both statutory and administrative) that are rarely enforced. However, because there is an assumption that passing laws solves every problem, India is over-legislated and under-governed. Consider driving tests as an example. Certain mandatory skills are required to obtain a driving license and no one can object to that. It is difficult to obtain a driving license abroad and extremely easy to obtain it in India.

Ostensibly, the testing in India can only be done by a public agency. De facto, it is impossible to obtain a license unless one bribes road transport authorities through touts, or unless one enrolls in a private "driving school". These private driving schools have established networks and are small and unorganized. Rarely do they have any tests. This is an instance of what has been called India's "flailing State", with disconnect between what policy intends and what administrative delivery ensures.

Wouldn't it be better to recognize larger and organized private driving schools and grant them testing rights, prosecuting them in cases of violations? De facto, we already have privatization. We need to make it more efficient. This issue crops up in the context of food laws, pharmaceuticals and even fertilizers and seeds. One reason behind farmer suicides is stated to fake fertilizers and seeds. That is, regulation and governance do not deliver and are believed to have deteriorated since the mid-1980s.

---

* Bibek Debroy is a noted Indian economist and is currently a Professor at Centre for Policy Research, New Delhi. An alumni of Presidency College (Calcutta), Delhi School of Economics and Trinity College (Cambridge), he has held positions such as the Director, the Rajiv Gandhi Institute for Contemporary Studies; Consultant to the Department of Economic Affairs of Finance Ministry (Government of India); Secretary General of PHD Chamber of Commerce and Industry and Director of the project LARGE (Legal Adjustments and Reforms for Globalising the Economy), set up by the Finance Ministry and UNDP for examining legal reforms in India. He has been a member of the National Manufacturing Competitive Council since November 2004.

There is of course a difference between fake (counterfeit) and sub-standard. For both, testing and inspection are non-existent for food and pharmaceuticals and this study demonstrates how easily the policy intention is circumvented for fertilizers. Fiscal constraints have prevented up-gradation and technological modernization of government laboratories. Nor is there a sufficient number of inspectors. One part of the jigsaw, including for fertilizers, is out-sourcing of the testing function to the private sector. The second element concerns orders that were issued under the Essential Commodities Act (ECA). The ECA is an anachronism. After all, it was enacted in 1954 and was never meant to be permanent, since it was an outcome of war-time shortages and the Defence of India Rules, 1939.

There are several examples to show (including in this study) how controls under assorted orders under ECA only perpetuate shortages, poor quality and government licensing-type controls that impede progress. They do little to improve governance or protect the underprivileged. Yet, these orders confer draconian powers of petty government functionaries, contributing to rent-seeking and bribery, especially when there is no distinction between what is a minor transgression and a major crime. The two-phase tests reported in this study demonstrate this. So far, all that has happened is cosmetic tinkering with ECA. Instead, an overhaul is needed. Greater and better testing facilities, a credible monitoring and a disciplined enforcement system are the need of the hour; and not the indiscriminate rent seeking regime we have today.

***

1. Executive Summary

Despite the growing use of fertilizers in India, the country is experiencing stagnation in agricultural productivity and degradation of soil quality. Efforts should therefore aim at ensuring an agriculture ecosystem where there is a balanced use of fertilizers and where farmers have adequate knowledge of the use of micro-nutrients. However, the most critical issue concerns the quality of the fertilizers provided to the farmers as productivity is affected by poor quality fertilizers to a large extent[1]. This paper analyses the weaknesses in the current fertilizer quality control mechanism. It puts forth policy recommendations with an aim to correct the shortcomings and strengthen the market mechanism so as to accomplish the stated public policy more effectively.

The study identifies three broad areas where immediate corrective action is required:

(a) Product and testing standards (overambitious tolerance limits, inappropriate testing method for micro-nutrient fertilizers etc.);

(b) Testing infrastructure (few testing laboratories with less than optimal capacity, non-judicious sampling, deficiencies in human resources etc.);

(c) Administrative mechanism including legal provisions (malpractices in sampling and testing, low rates of prosecution, inability of small scale firms to contest administrative malpractices etc.).

The Policy recommendations proposed include:

- Improving the efficiency of the regulatory mechanism through an adequate number of laboratories that are fully equipped and accredited, correcting faulty sampling pattern, adequate and well trained inspectors etc., checking deliberate manipulation of test results, putting in place a transparent system for retesting.
- Moderating the provisions of FCO: The range of tolerance limits specified by the FCO are too stringent and impractical. The tolerance limits needs to be moderate and pragmatic. There is also a need to appreciate the distinction between mistake and fraud, i.e. between sub-standard and adulterated fertilizers. The punishment should be more severe in case of adulterated fertilizers than in the case of the sub- standard ones. The specifications of

[1] Despite an elaborate quality control mechanism in place since the promulgation of the Fertilizer Control Order.

the various fertilizers should be limited to main nutrient contents including the parameters and/ or impurities which are harmful for agriculture or human consumption, not the physical impurities.

- Other suggested measures include: popularizing the Rapid Testing Kit, involving the private sector in training and testing, introducing more appropriate testing methods etc.

Most importantly, the study clearly finds that the prevalence of 'sub-standard' fertilizers is not simply because of malafide intentions of its producers but is a symptom of a chronic illness afflicting the fertilizer quality assurance mechanism itself, because of which the problem of quality control is perpetuated, rather than controlled. It concludes that the entire quality control mechanism needs an urgent overhaul.

2. Introduction

India became self sufficient in food grain production after the first Green Revolution in the 1960s establishing itself as one of the leading food producers in the world. Various factors contributed to its success story including high yielding variety seeds, increased irrigation facilities and higher application of inputs like fertilizers. Realizing the importance of fertilizers in raising productivity, the Indian government made several attempts to increase its usage. Some of the major initiatives included introduction of the Retention Price cum Subsidy Scheme (RPS) in 1977 to provide fertilizers to farmers at minimum prices without harming the interests of manufacturers and de-licensing of the fertilizer industry in 1991 to allow manufacturers to set up fertilizer plants without obtaining permission from government after getting the environmental clearance. These efforts led to an increase in the consumption of fertilizers from 0.7 lakh MT in 1950-51 to 249.09 lakh MT in the year 2008-09[2].

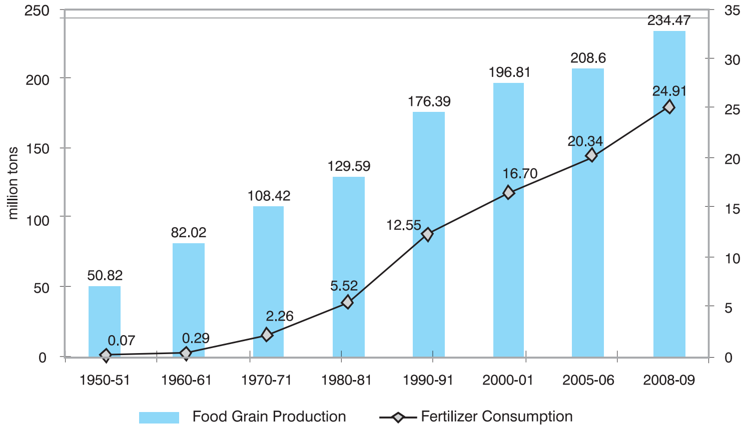
Types of fertilizers: Fertilizers are categorized into three broad categories - **Primary fertilizers** (popularly called chemical fertilizers containing nitrogen, phosphorous and potassium i.e., N, P, K), **Secondary fertilizers** with sulphur, calcium and magnesium and **Micro Nutrient Fertilizers (MNF)** providing zinc, boron, copper, iron, manganese, molybdenum etc. While the primary fertilizers are required in larger amounts, the secondary fertilizers and the MNFs are required in smaller quantities. The micro nutrients are also called trace elements whose deficiency can affect food grain yield equally. The MNFs play an important role in many biochemical reactions in the plant cells and thus enhance plant productivity.

Overemphasis on NPK: Despite realizing the importance of the MNFs, the efforts put by the government to increase food grain yield have been mostly directed towards primary fertilizers. A complex process works behind plant growth where the plant synthesizes food using carbon dioxide, water, solar energy and soil nutrients (primary and secondary). Insufficient quantity of any of these hampers the plant growth. This confirms ‘Liebig’s Law of the Minimum’ which says, “if one crop nutrient is missing or deficient, plant growth will be poor, even if the other elements are abundant”. Continuous stress on chemical fertilizers led to stagnation in food grain production (See Fig. 1) since increased use of these chemical fertilizers over a period of time jeopardized the health of soil. Excessive usage of chemical fertilizers also affects the availability

[2] Annual Report, Ministry of Chemicals & Fertilizers, Department of Fertilizers

of micro nutrients in it. For instance, excess of nitrogen leads to deficiency in zinc and excess of phosphorous leads to both zinc and copper deficiency.

Fig 1 : Food grain production vis-à-vis fertilizer consumption in India



Source: Ministry of Agriculture, Government of India, various years

An essential task, therefore, is to ensure establishment and sustainment of an agriculture ecosystem that entails the balanced use of fertilizers and also makes it possible for farmers to have adequate knowledge of the use of micro-nutrients. This involves introducing various improvements in areas such as agricultural extension services, basic agricultural research, training at agricultural colleges and universities with an aim to improve the knowledge base of farmers regarding the judicious mix of primary, secondary and micro nutrient fertilizers.

Quality of fertilizers: The most critical issue concerns the quality of the fertilizers provided to the farmers, and therefore, the quality control system that ensures delivery of good quality fertilizers must be effective and efficient. It is clear that productivity is affected by poor quality fertilizers to a large extent. Yet, in spite of the presence of an elaborate mechanism for quality control in India, the problem of spurious fertilizers is rampant. The Central Fertilizer Quality Control Testing Institute (CFQCTI), Faridabad, claims that around 70 percent of the problems in quality control is due to adulteration or misbranding, another 20 percent of the problems due to the deliberate manufacturing of low quality fertilizers and the remaining 10 percent due to the difference of the content of the bags and black marketing.[3]

[3] Status of fertilizer quality control in India, Central Fertilizer Quality Control Testing Institute, Faridabad, 2005

The FCO and Fertilizer Quality: Fertilizer is the most critical and costly input for sustaining agricultural production and ensuring food security in a country. The Fertilizer Control Order (FCO), 1985, enacted under The Essential Commodities Act, 1955, is being implemented to regulate the trade, price, quality and distribution of fertilizers in the country. The State Governments are the enforcement agencies for implementation of the provisions of the FCO and are adequately empowered to take action against those who indulge in production and sale of non standard/spurious fertilizers. The FCO provides for compulsory registration of fertilizer manufacturers, importers and dealers, specifications of all fertilizers manufactured/imported and sold in the country, regulation on manufacture of fertilizer mixtures, packing and marking of fertilizer bags, appointment of enforcement agencies, setting up of quality control laboratories and prohibition on manufacture/import and sale of non-standard/spurious/adulterated fertilizers. A major role is played by fertilizer inspectors appointed by the Central and state governments who draw random samples of the fertilizers and send them to laboratories for testing. Accordingly, 71 Fertilizer Quality Control Laboratories were set-up in the country which included the four set up by the Central Government namely Central Fertilizer Quality Control & Training Institute, Faridabad and its three associated Regional Laboratories. These laboratories have a total annual analyzing capacity of 1.33 lakh samples. The analytical capacity and the number of samples analysed and found non standard during the last 5 years are as being given below.

Table 1: Analytical Capacity of Labs

Year	No. of Labs	Capacity to Analyse Samples	Samples Analysed	% Non Standard Sampled
2004-05	67	124,730	108,859	6.0
2005-06	67	122,488	111,745	6.0
2006-07	68	129,250	116,142	6.0
2007-08	68	129,331	95,866	6.2
2008-09	71	132,865	104,792	5.5

Source: Strengthening of Central fertilizer Quality Control & Training, Institute and its Regional Laboratories

The impact of using sub-standard fertilizers: The presence of sub-standard fertilizers hampers the efficiency of the agricultural system and there are many aspects to the same. Firstly, the sub-standard fertilizers do not provide the requisite nutrients resulting in under nourishment of the soil which forces the farmers to lose faith in the system as well as in new technologies. Secondly, in some cases the additives may harm the quality of the soil and the output. Practices such as these make adulteration and the use of substandard fertilizers a serious problem for the livelihood of a farmer and for the food security of the nation. The stagnating food grain production in recent years is just one manifestation of the crisis at hand. These concerns are well appreciated, are in public domain and have resulted in the development of an elaborate quality control institutional mechanism over the years.

The critical problem: In all the debate on quality control of fertilizers, however, one important missing element has been the lack of understanding of the repercussions of the weaknesses inherent in the quality control mechanism. This leads to the perpetuation of the quality problems, weaknesses that have resulted in rewarding (intentionally or unintentionally) the producers of spurious/below-par fertilizers and punishing good quality producers and traders. In a nutshell, the problems stem from that the archaic and rigid provisions (that includes incarceration) and are misused by the agents of the state to extract 'side payments' from the dealers/producers. The mechanism is simple: failure of a sample during a quality control test is a warning signal to the producer to conform to the wishes of the agents of the state. Consequently after a successful transaction, the sample passes at the re-testing phase. The problem lies in the first testing stage itself where inordinately large proportions of the samples are failed. Given the archaic and rigid nature of punishments the agents of the state are able to extract greater side-payments. Moreover producers that do so, then have a lower incentive to maintain quality. At the same time, producers who do not, risk the fear of highly rigid provisions being applied to them. The solution is, of course, not greater prosecutions as that will only increase the ability to extract more side payments. It is a scientific problem and needs to be dealt with in a scientific manner – better quality testing systems and better quality human interface.

Objectives of the paper: This paper examines the issue of quality control in depth, since all other efforts or policy recommendations to improve agriculture productivity will bear fruit only when the fertilizers used in the fields adhere to their standards. This paper therefore analyses the weaknesses in the current practices of fertilizer quality. It highlights the fact that the prevalent incentive structure for producers and consumers is lopsided. Finally, it puts forth policy recommendations to correct the shortcomings and strengthen the market mechanism so that the goals of the stated public policy are achieved more effectively and efficiently.

3. Quality Control Mechanism for Fertilizers in India

The History of fertilizer quality control in India: The issue of quality control of fertilizers has always been a matter of concern with policy makers; in fact the first step was taken decades ago when fertilizer was declared as an essential commodity in 1957. As mentioned earlier more specific steps were taken by promulgating the FCO under Section 3 of the Essential Commodities Act (1955) to regulate trade, price, quality and distribution of fertilizers in the country. The main provisions of the FCO were:

i. Compulsory registration of all fertilizer manufacturers, importers and dealers

ii. Specification of the contents of the fertilizers manufactured in the country and those imported from other countries

iii. Appointment of enforcement agencies

iv. Setting up of quality control laboratories to test the fertilizer samples drawn from the dealers

v. Prohibition on manufacture/import and sale of non-standard/ spurious/ adulterated fertilizers

The Essential Commodities Act 1955 (ECA) and the Fertilizer Control Order: The Fertilizer Control Order (FCO) is an adjunct to the Essential Commodities Act 1955- an iconic regulatory regime symbolizing the 'licence-permit-raj'. While much of the regime has been dismantled progressively since 1991 with regards to industry, agricultural commodities continue to suffer from its stifling and sometimes draconian provisions. The FCO, continues to borrow liberally from the Essential Commodities Act. The penalties prescribed under section 7 of the ECA, 1955 are described below in brief.

- Imprisonment can be ordered from 3 months to 7 years with fine under Section 7(i) (a) (ii)
- Making any false information is punishable with up to 5 years imprisonment
- Fertilizer stock and its receptacle can also be forfeited under section 7(i) (ii)

- The FCO offences are treated as cognizable and non-bailable offences under section 10A
- All offences are to be tried by the Courts of 1st Class Magistrate only and imprisonment of up to 2 years with fine can be imposed
- The Authorization Letter of dealers can be suspended/ cancelled or the dealers debarred under clause 31 of FCO and no fresh authorization to the dealer can be issued within one year of the cancellation of their Authorization Letter or if the dealer has been convicted by the Court, the fresh authorization cannot be issued for up to 3 years
- The dues are mandated to be recovered as 'arrears of land revenue' which in turn rests on archaic and extremely rigid provisions including non-bailable imprisonment

Although the Essential Commodities Act and in the FCO were substantially amended in the year 2002 and 2003 respectively which led to liberalization in the registration process, introduction of the mechanism of referee analysis, reduction in time for sample analysis etc. Yet, many archaic and rigid provisions, mentioned in the previous paragraph, remain in force.

Er{#4=#Ihuwlol}huv#wdnhq#xs#iru#Vwxg|#dqg#uhvshfwlyh#Dehuudwlrqv		
1	Diammonium Phosphate	DAP
2	Micronutrient Fertilizer Mixtures	MNFM
3	Potassium Chloride (Muriate of Potash)	MOP
4	Nitrogen Potassium Phosphorous	NPK
5	Single Superphosphate (P_2O_5 Granule)	SSP (G)
6	Single Superphosphate (P_2O_5 Powdered)	SSP (P)
7	Urea	Urea
8	Chelated Zinc	Zn-EDTA
9	Zinc Sulphate Heptahydrate	ZSH
10	Zinc Sulphate Mono- hydrate	ZSM

4. The Problem of Efficacy in Quality Control

The extent of the problem in quality control: The aggregated data presented in Table-1 do not reflect the true dimensions of the problem. That requires us to look at the individual test results which can help understand what happens to an individual. However, these are typically not available in the public domain. Therefore, to analyse this data better, the facility of the Right to Information Act was used and the information on test results was obtained from the following states: Andhra Pradesh, Haryana, West Bengal, and Uttar Pradesh. In addition, test results were also received from CFQCTI and its regional fertilizer quality control laboratories.

The sample of the study consists of states spread geographically across India- comprising of those at the lower, middle and higher end of agriculture productivity and from the state as well as central level institutions. Moreover, the data obtained included all the tests conducted in a calendar year and no sub-sampling was conducted. To illustrate: data for 2505 tests from seventeen central and states laboratories for three calendar years through required 120 RTI applications to get the analysis reports.

Further, data were also collected for the samples which were granted retesting permission under clause 32 (2) of the FCO. These records and data were sought from Central Fertilizer Quality Control Laboratory & Training Institute, Faridabad and its Regional Laboratories located at Navi Mumbai, Chennai and Kalyani (Kolkata) along with the records obtained from selected State Governments spread all over the country.

Box 2: Names of the laboratories from which sample data were obtained	
1	CFQCTI, Faridabad
2	RFCL, Navi Mumbai
3	RFCL, Kalyani
4	RFCL, Chennai
5	SFQCL, Anantpur, Andhra Pradesh
6	SFQCL, Bapatla, Andhra Pradesh
7	SFQCL, Rajindranagar, Andhra Pradesh
8	SFQCL, Warrangal, Andhra Pradesh
9	SFQCL, Tadepalligudem, Andhra Pradesh
10	SFQCL, Karnal, Haryana
11	SFQCL, Hissar, Haryana
12	SFQCL, Kolkata,West Bangal
13	SFQCL, Midnapore,West Bangal
14	SFQCL, Murshidabad,West Bangal
15	SFQCL, Lucknow, Uttar Pradesh
16	SFQCL, Meerut, Uttar Pradesh
17	SFQCL, Varanasi, Uttar Pradesh
CFQCTI: Central Fertiliser Quality Control & Training Institute, Govt. of India	
RFCL: Regional Fertiliser Control Lab, Govt. of India	
SFQCLState Fertiliser Quality Control Lab	

Table 2-A: Summary of results of samples reported sub-standard: number wise

Fertilizer	Nos. of Samples	No. of samples having nutrient deficiency				Sub-standard for other parameters	
		> 50%	25-50%	10-25%	upto 10%	Technical	Physical
DAP	506	19	72	46	163	90	116
SSP (P)	750	34	70	156	351	108	31
SSP (G)	191	4	12	29	71		75
NPK	505	30	49	51	251	53	71
MNFM*	202	133	48	14	7		
ZSH**	92	25	3	18	46		
ZSM**	42	3	1	10	27	1	
Zn-EDTA	23	13	1	1	6	2	
Urea	124	7	3	27	76	1	10
MOP	70	10					60
TOTAL	2505	278	259	352	998	255	363

*Incomplete specification/ testing; nutrient contents notified are miniscule.
**Tests not on complete specifications

Table 2-B: Summary of results of samples reported sub-standard: percentage wise

Fertilizer	Nos. of Samples	No. of samples having nutrient deficiency				Sub-standard for other parameters	
		> 50%	25-50%	10-25%	upto 10%	Technical	Physical
DAP	506	4%	14%	9%	32%	18%	23%
SSP (P)	750	5%	9%	21%	47%	14%	4%
SSP (G)	191	2%	6%	15%	37%		39%
NPK	505	6%	10%	10%	50%	10%	14%
MNFM	202	66%	24%	7%	3%	-	-
ZSH	92	27%	3%	20%	50%	-	-
ZSM	42	7%	2%	24%	64%	2%	-
Zn-EDTA	23	57%	4%	4%	26%	9%	-
Urea	124	6%	2%	22%	61%	1%	8%
MOP	70	14%	-	-	-	-	86%
TOTAL	2505	11%	10%	14%	40%	10%	14%

Box 3: Classification of parameters to evaluate FQCL testing reports

Name of Fertilizer	Nutrient	Technical	Physical
DAP	• Total & Ammonical Nitrogen, • Neutral Ammonium Citrate & Water soluble phosphates	• Total Nitrogen in the form of Urea	• Moisture, • Particle size
MNFM	• Zinc • Ferrous • Copper • Magnesium • Molybdenum • Boron	• pH	
MOP	• Water soluble • Potash	• Sodium	• Moisture • Particle size
NPK	• Nitrogen (all types) • Water soluble phosphate • Water soluble potash	• Calcium nitrate • Chlorides • *(wherever applicable)*	• Moisture, • Particle size
SSP(G)	• Water soluble phosphate • Sulphur	• Free phosphoric acid	• Moisture • Particle size
SSP(P)	• Water soluble phosphate • Sulphur	• Free phosporic acid	• Moisture
Urea	• Nitrogen	• Biurat	• Moisture • Particle size
Zn-EDTA	• Zinc	• pH, • Lead,	• Appearance-free flowing crystalline/ powder
ZSH	• Zinc • Sulphur	• pH • Copper • Magnesium • Lead • Cadmium • Arsenic	• Matter insoluble in water
ZSM	• Zinc • Sulphur	• pH • Copper • Iron • Magnesium • Lead • Cadmium • Arsenic powder	• Free flowing • Matter insoluble in water

Results of sample reports:

- About 75% of the sub-standard samples are found having nutrient deficiency or termed as 'adulterated' after testing. Only about a fourth was classified as substandard on account of technical or physical deficiencies.
- The analysis of the individual records shows that *more than half* of the sub-standard and/ or 'adulterated' samples in fact had a deficiency level of less than 10% of specified nutrient contents. The economic gains to the producer/trader from such a low level of 'adulteration', looks implausible.
- The percentage of cases, where the nutrient deficiency is greater than 50%, which may have provided any appreciable financial gain to the producer/trader – the extent of such samples is only 11%.
- A further closer examination reveals that among the samples having a nutrient deficiency of greater than 50%, two groups- Micro Nutrient Fertilizer Mixture (MNFM) and Zn-EDTA had the maximum deficiency, 66% and 57% respectively, indicating serious problems with these fertilizers.

Many of these problems have been in the public domain for years. The Central Fertilizer Quality Control and Training Institute conducted a study titled "National Status of Fertilizer Quality Control" on these issues, that was presented at the National Seminar on Fertilizer Quality Control held at Faridabad in April, 2005. NPK, SSP and DAP among others were classified as adulteration prone among others. Our analysis of the raw data from state level laboratories reveals that samples having nutrient deficiency of less than 10% formed the majority of test results - this puts to test the argument that these are adulteration prone. The other major nutrient classified as prone to being sub-standard was MNFM (micronutrient fertilizer mixtures). Latter sections reveal that the problem has more to do with the ability of poorly equipped test facilities to adequately capture deviations. These issues are discussed in the next section.

5. Reasons for Deviation from Standards

What explains this deviation from standards in spite of the presence of an elaborate quality control system backed by rigorous legal mechanism? While the malafide intention of the producers/ traders is taken for granted as an easy explanation, there is a need for analyzing the quality problems objectively. The study analyses the issue from three stand points:

a. Product and Testing Standards

b. Testing infrastructure

c. Administrative mechanism including legal provisions

a. The Product and Testing Standards

From the discussion in the previous section, we have observed that the maximum deviation from the standards is found to be in the MNF mixtures. Let us examine them first. There are two types of micronutrient fertilizers defined in the FCO. Firstly, there are straight MNFs[4]. Secondly, there are MNF 'mixtures,' which the State governments notify under clause 13 of the FCO. Different State governments have indeed notified a variety of mixtures for specific crops prescribing nutritional values that different micronutrients are supposed to contain in the mixture. An analysis of these shows the divergence between state level norms further (see Annexure 1). This also reflects the vagueness in what is concerned optimal among the community of experts involved in drafting these norms.

Most of these proposed mixtures (typically containing 3 to 5 micro nutrients) are supposed to contain extremely low nutritional values, especially vis-à-vis the ability of the testing infrastructure to capture such granularity. Consider molybdenum or Mo. The specification percentage by weight mandated in Orissa is 0.005%, in Bihar 0.02% and in Himachal 0.01% (See Annexure-1). To take the nutrient value to the notified level, fillers are required to be added which can affect the testing results of MNFs in many different ways. At the same time, the prescribed values of vital nutrients like Zinc ranges from 2 to 10% only, which too, is sometimes low to provide the sufficient nutrient support needed in the Indian context.

[4] Defined as per heading I(F) of Part-A of Schedule-I of FCO, which are notified by the Central Government

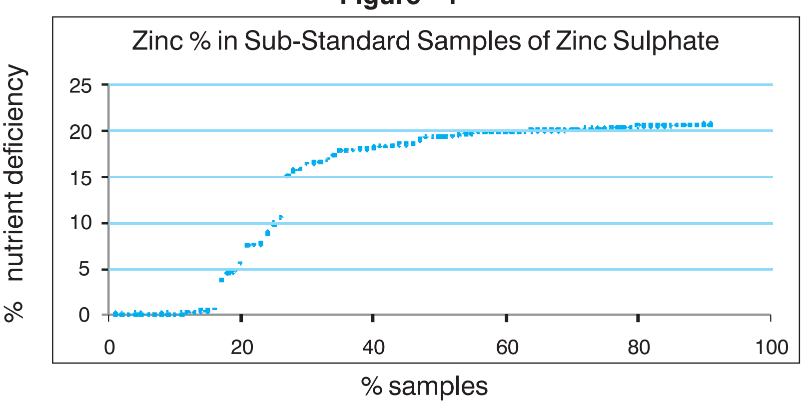
Till recently, there was no standard testing method for MNF mixtures (which contain minuscule values of several micro nutrients). The test for mixtures is done in the same way it is done for straight Micronutrients (single nutrient) which obviously contain a much higher value of a nutrient in a given sample. Such a practice is hugely error prone. Moreover, the high usage of fillers which also contain such elements, can also interfere with and influence the result substantially. What is critical is the need to have the right tolerance level- a determining factor, in realistically assessing the extent of deviation from the standard. The CFQCTI (2005) highlights the same issues:

> ***"The tolerance limits in the various straight and complex fertilizers have been prescribed in the range of 0.1 ~ 0.7 only, without any validated statistical study. These tolerances are very very stringent even in comparison to the developed countries (Lance, 1982 and Verma et. al. 1982). This often results into either over formulation of the grades by the manufacturers or declaration of the samples as non-standard by the States..." [emphasis ours]***

These problems are not limited to mixtures alone. The CFQCTI paper (2005) besides admitting deletion of obsolete/ non-functional grades of fertilizers, notes:

> ***"... Specifications of some fertilizers need review and amendment in case of straight micronutrient fertilizers, to delete the limit of other micro nutrient fertilizers prescribed therein. (And) tolerance limits should be based on validated field studies and ground realities"***

Figure - 1



Source: Data obtained from laboratories by FISME through RTI.

In the present study (Table 2-A) about 50% of the samples of Zinc Sulphate Heptahydrate (ZSH) contain less than 10% of nutrient deficiency. However, further analysis reveals that 30% of the total sample size is found containing 20.01% to 20.79% Zinc content from various notified laboratories. This appears to be the result of adopting inappropriate testing steps / methods through AAS. A sample is passed at 20.8% (including tolerance) showing how thin the margin is. The figure below is just an example of the situation – we find a similar situation in case of all fertilizers. It shows that of all the failed samples, the vast majority is actually very close to the prescribed norm and only marginally lower than the prescription of 20.8%. Even for each of the above mentioned cases, the draconian provisions of the FCO/ ECA apply.

There are alternatives, no doubt. However, the alternate method of analysis is the choice of the individual working in the laboratory with limited cross-checks[5]. And different methods do yield different results as shown in the table below.

Table 3: Comparison between the two prescribed methods for determination of Zinc content in Zinc Sulphate Heptahydrate and Zinc Sulphate Monohydrate

Parameters	EDTA Titration method [Preferred method of BIS]	AAS method [Preferred method of FQC laboratories]	Remarks
Sample weight	1.0gm	0.25gm	Electronic balances have .003gm (+ / -) variation, Lesser is the weight of sample more is the chances of variation in result.
Dilution	100ml	1000ml	More is the dilution, error is multiplied and provide higher chances of deviation.
Further dilution	-	50 times (5ml of the above in to 250ml acidified water)	Higher probability of distortion of results due to further dilution
Sample used	10ml from the above aliquot for titration.	Placed under AAS for flaming.	Highly diluted smaller size of the sample may lead to the deviation in the analysis results.

[5] Experts are of the opinion that for the determination of Zinc in Zinc Sulphate, modified EDTA Titration method should be preferred and the AAS method should be prescribed as "referee method" rather than an alternate method for determination of Zinc under the FCO, 1985.

It is clearly evident that there is variation in the results depending upon the method used, consequently the stringency of the provisions is not in line with the ability of the regulatory mechanism to identify the defaulters appropriately.

To recapitulate the discussion:

(a) The norms at the level of states differ

(b) They may be too low for seamless testing given the technology available, and

(c) There is uncertainty as to what is the best level of nutrient required

The regulatory system also fails to appreciate that soil quality differs significantly within the state and the norms decided are based on a sort of an aggregate. Therefore, a minor variation from the norm is not injurious for the crop to warrant a severe penalty.

In other words, it is obvious that deviation from the norm needs to be monitored and norms need to be enforced. But the key issue is that enforcement needs to be able to differentiate between deliberate adulteration, laxity in production or storage, or variation due to circumstances beyond the producers' control. Deliberate adulteration needs to be severely punished. Laxity in production, however, stems from technological capability and also from incentives available in an economy and needs a nuanced response. Lastly, the exogenous or uncontrollable factors often impact physical and chemical characteristics of samples and producers need not be punished if they are within a small enough range.

Consequently, rather than a sample by sample approach, a crop-company-location approach is desirable. Such a system will help segregating serious offences from ones that warrant just a warning, thus improving quality of enforcement and impact.

b. Testing infrastructure

Inadequate Testing Capacities of Approved Laboratories[6] : By the mid 2000s, the infrastructure in India for the exclusive testing of fertilizers comprised of 67 laboratories under Central and State governments with annual capacity to analyse 1,25,000 samples. By 2009, the number of these labs had increased to 71 and the testing capacity to about 1,33,000 samples annually. Despite the increase, capacity remains

[6] Data from various CFQCTI documents.

woefully short of testing even the bare minimum number of samples. For instance, in 2003-04, there were about 2,82,000 dealers across the country. One sample per year for each dealer comes close to 2,82,000. Consequently the current capacities are at least half of what was required in 2003-04. Further, if the optimum number of samples is considered based on the criteria suggested by the CFQCTI, that each dealer should be inspected at-least once during peak consumption period of kharif and rabi and samples taken for all types of fertilizers made, the required number rises to 16,92,000. The requirement of testing is over 12 times than the current capacities of testing labs! There may be variations from state to state but the moot point is that the gap in testing infrastructure is alarming nationally.

Imbalanced Capacity utilization of Laboratories: As per the FCO, testing can be carried out only by an 'approved' lab, the number of which by 2009 was only 71. As stated earlier, while there is a huge unmet demand for testing, many states report capacity utilization of less than 50% and others of more than 100%! In the latter case, it is suspected that quality of testing is being compromised. Data provided towards the end of this monograph, published by CFQCTI and analysed by FISME, shows that in states such as Assam, Bihar, West Bengal and Jharkhand, less than 50 percent of the capacity of laboratory is utilized. On the other hand, in states such as UP, the number of samples analysed is often much higher than the capacity of the laboratory. A month-wise analysis of fertilizer samples tested in the fertilizer and pesticides quality control laboratory at Alambagh, Lucknow for the years 2005-06, 2006-07 and 2007-08 depicts that for the first two years, the samples analysed exceeded the total capacity of the samples that were to be tested. (See Annexure-2).

Non-judicious sampling: The quality control system also suffers from the flawed sampling pattern of fertilizers. The regulatory system classifies certain fertilizers as 'prone'- implying the fertilizers are more likely to be reported as sub-standard. In view of the limited laboratory capacity prevailing in the country, the 'prone' category of fertilizers like fertilizers mixtures should have been given special attention compared to the 'non-prone' ones. However, a substantial number of samples continue to be drawn from the 'non-prone' fertilizers such as Urea which unnecessarily burden the existing limited testing infrastructure.

Table 3 shows that around 11 percent of the MNF are found to be sub standard, but only 4 percent of the total samples analysed are of MNF. On the other hand, when around 19 percent of total samples analysed are urea samples, only 1.2 percent of these have been found to be sub standard. Why do inspectors sample a larger share of non-prone fertilizers? The answer to this faulty sampling pattern perhaps lies with the work norms given to fertilizer inspectors. The inspectors are supposed to fill quotas of samples. Hence, they fill the quotas with non-prone fertilizers like urea where there is hardly any scope for adulteration. Or there may be other reasons. However, the moot point is that the prevailing system of drawing system is ad-hoc.

Table 4: Product wise comparison of all non standard samples

Fertilizers	Non standard Samples (%)	Share in total samples analysed (%)
Urea	1.2	18.9
CAN	3.4	0.4
SSP	11.2	12.4
DAP	4.1	22.4
MOP/SOP	1.7	14.0
NPK(C)	6.3	15.8
NPK(M)	13.0	7.7
MNF	11.1	4.0
Others	4.5	4.6

Source: Adapted from CFQCTI (2005)

Human Resources: Deficiencies in qualification and training*:* Questions have been raised about the quality of human resources employed in these 'approved testing laboratories'. There are issues with the quality of testing analysts, lack of training, inefficiency etc. According to Clause 27A/29A of the FCO, it is mandatory for the inspectors to attend the training programmes conducted by the Central Fertilizer Quality Control Testing Institute, (Faridabad) and other regional laboratories. However, the attendance in these programmes is very thin specially in states like J&K, Kerala, Karnataka, UP, Bihar, Orissa and Gujarat. The CFQCTI paper highlights:

‘Unfortunately the existing qualification of B.Sc. (Agriculture)/ B.Sc. (Chemistry) for the analyst, results into appointment of non-chemistry/ agriculture post-graduates in many of the laboratories. Presently, as a rough estimate about 60-70-% of the analysts belong to such category. No doubt it affects the accuracy and so the credibility’

Shortage of full time inspectors: The inspectors are one of the critical players in the Fertilizer Quality Control process. Unfortunately, except for the five states of Haryana, Jammu and Kashmir, Gujarat, Maharashtra and Orissa, all other states have only part time inspectors. They have been entrusted with a range of responsibilities such as of drawing samples for testing (also from the premises of fertilizer manufacturing units), seizing fertilizer which is contrary to the FCO provisions etc. Without adequate manpower, the effectiveness of the system is compromised[7].

Use of non-calibrated equipment: From the replies filed by the laboratories in response to the RTI questions, it has been found that none of the laboratories/ institutes- including CFQCTI, gets their equipment calibrated periodically. These laboratories are dependent upon the electronic systems/devices which they ‘believe’ are self calibrated! The practice makes the results of these laboratories quite unreliable.

No-accreditation; No periodic quality audit; No traceability of tests: There is no mechanism of undertaking periodic quality audit of the testing laboratories. The fertilizer industry has been consistently demanding the ‘traceability’ of background data of tests conducted on the samples. However, with the help of replies received through the RTI it is revealed that laboratories do not have a mechanism of maintaining the base data of tests.

To ensure adherence to testing standards, the Government of India has set up National Accreditation Board for Testing and Calibration Laboratories (NABL), which provides accreditation to the testing laboratories that are performing tests / calibrations[8]. In addition, the NABL certified labs conform to global benchmarks as the NABL accreditation mechanism has to also comply with the requirements of Asia Pacific Laboratory Accreditation Cooperation Mutual Recognition Arrangement (APLAC MRA). It requires the applicant and the accredited laboratories to take part in recognized Proficiency Testing Programmes

---

7 Status of fertilizer quality control in India, Central Fertilizer Quality Control Testing Institute, Faridabad

8 In accordance with ISO/IEC 17011:2004

in accordance with ISO/IEC Guide. But none of these 'approved laboratories' under the FCO is accredited by the NABL. Accreditation to the NABL would have ensured that at least bare minimum standard testing procedures– including traceability, were adhered to and that would have induced confidence among stakeholders.

c. Administration and legal dispensation

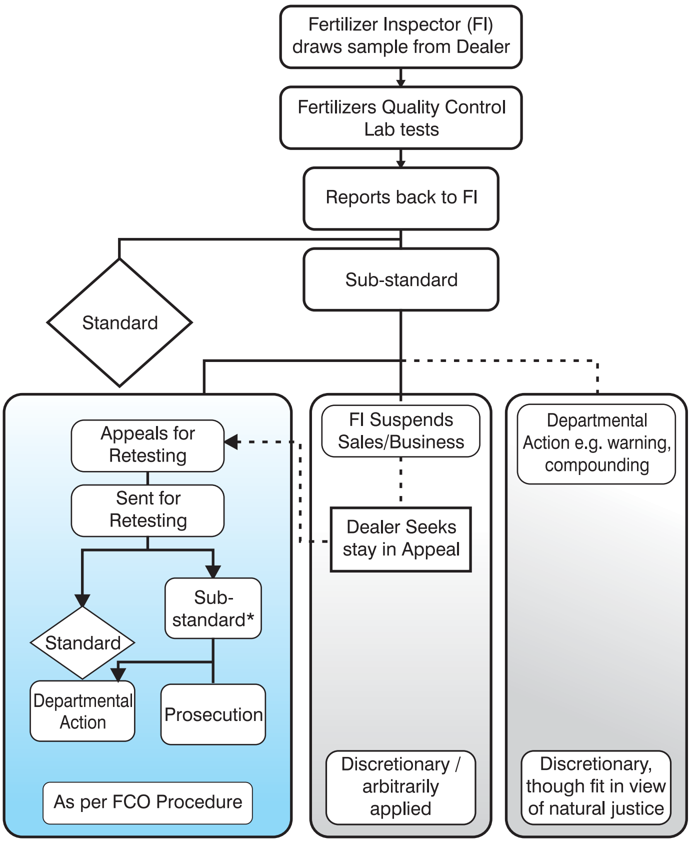
As mentioned in Section 2, to ensure adequate availability of the right quality of fertilizers at the right time and at the right price to farmers, fertilizer was declared an 'essential commodity' and the FCO was promulgated under Section 3 of the ECA 1955, to regulate the trade, price, quality and distribution of fertilizers in the country. The FCO provides for compulsory registration of fertilizer manufacturers, importers and dealers, specification of all fertilizers manufactured/imported and sold in the country, regulation on manufacture of fertilizer mixtures, packing and marking on the fertilizer bags, appointment of enforcement agencies, setting up of quality control laboratories and prohibition on manufacture/import and sale of non-standard/spurious/adulterated fertilizers.

The state governments are responsible for implementing the provisions of the FCO and are mandated to establish the enforcement mechanism namely the fertilizer inspectors, the registering authority/notified authority and the appellate authority. A multi stage system works behind the quality testing of the fertilizer samples.

The main role is played by the fertilizer inspectors followed by the analysts who examine the samples in the laboratories. First, the fertilizer inspectors draw samples from the dealers and send them within seven days to the analysts in the lab for examination. The analysts, in turn, send the report back to the inspector within thirty days after examination. If the sample meets the prescribed standard, the dealer gets the permission to sell the fertilizer in the market.

If the sample fails to meet the standard, the dealer has two options. The punishment is accepted by the dealer and the matter is 'settled' between the inspector and the dealer through explicit or implicit considerations. Alternatively, if the dealer decides to appeal against the finding of the test result, an appeal could be filed to the appellate authority within 30 days. The appellate authority sends the referee sample to a laboratory outside its jurisdiction for re-examination. The laboratory then reports back the results to the appellate authority within thirty days. If the sample is cleared, the producer/ trader is permitted to carry on his/her business. On the other hand, if the sample fails, then either administrative action or prosecution is carried out against the fertilizer the producer/ trader. The mechanism can be better understood with the help of the accompanying flow diagram.

Flow Chart: Sampling and Testing Practice



Over-dependence on Fertilizer Analysts: In the whole process of the FCO administration, the role of the Fertilizer Analyst is the most critical one. Once a sample is drawn from a registered dealer, all provisions of the FCO are dependent on the testing report of the Analyst. Based on the report, the dealer could be prosecuted, barred from doing business and could even be imprisoned under an offence that is non-bailable.

However, as we have seen the current testing regime, starting from the testing equipment, manpower to testing methodologies and practices, the quality control system is the one that is suffering from serious deficiencies. The problems are exacerbated because of stringent tolerance limits which presuppose an efficient and suitably equipped infrastructure. In the absence of which even small inadvertent results could fail the whole quality assurance mechanism.

Malpractices in sampling and testing: The manufacturers and dealers are routinely subjected to hand-twisting and rent seeking by inspectors and analysts- many a times acting in connivance with each other, who threaten to produce reports which could put the dealer's business in jeopardy. Prevalence of such practices create large disincentives for genuine quality producers for they are also subjected to the same rigmarole as the unscrupulous producers. It is obviously difficult to produce direct evidence in support of such allegations. However, the following data sets provide a credible proxy of ground realities.

Once the sample fails in the first round, it is sent for re-testing to the central or state's laboratories. FISME was also able to obtain the results of such re-testing through the RTIs from the three states of Punjab, UP and Andhra Pradesh. Here some samples were found to be sub standard and some were passed. However, it is not clear why a sample that has failed in the first round gets approval in the second round. The only information which is available is the number of samples passed during re-analysis. The following table shows the samples passed during re-analysis in the states of Punjab, Uttar Pradesh and Andhra Pradesh.

Table 5: Samples passed during re-analysis (%)

Year	Punjab	Uttar Pradesh	Andhra Pradesh
2003-04	58	61	31
2004-05	44	72	44
2005-06	46	61	36

[**Source:** FISME, based on responses sought through the RTIs]

Table (5) shows that of the information accessed by FISME on retesting, around fifty percent of the samples sent for re-analysis passes in the second round of testing. Though, on the basis of limited information, it is difficult to analyse the reasons behind such a large proportion of samples being passed on re-analysis, yet these are enough to put a questions mark on the testing mechanism. Either the first round test is correct, in which case, most should fail the second round test - then it appears that faulty samples are actually being passed in the second round with the possible connivance of inspectors. Or the first round tests themselves are not correct and good quality samples are being sent for re-analysis. In either case, the fact that a large majority of samples passes the second round of testing indicates that there are flaws in the system that need to be addressed.

Further, in some cases error occurs on the part of the fertilizer inspectors in giving codes to the samples. There are also instances where reports are not complete. Again in certain cases, equipment used for testing the samples are faulty and do not give correct results.

Low prosecutions and causes thereof: Not withstanding the provisions for legal prosecutions against offenders, prosecution results barely in 5 to 6 percent of the total number of cases and convictions, hardly in any case (Annexure -7 for details). Further, in most of the cases where samples are declared sub-standard, only administrative action is taken against the offenders although no such provision exists in the FCO. There are underlining reasons.

The authorities face a dilemma because among the samples declared substandard: (i) about 25% of such samples have deviation in technical and/or physical parameters (ii) 40% of samples have deficiency less than 10% in nutrient contents (Table 2B). In both the cases, the quantum of deviation is found to be insignificant. But, the FCO prescribes only one level of penalty whether the deviation is mild e.g. 1% higher moisture or 100% deviation in nutrient parameters.

It can be observed that of the cases where samples are declared as sub-standard at the first stage, only in a small number of cases the appeals are preferred (to seek retesting) (Table 6).

Table 6: Retesting details of failed samples

State	Samples 2003-04				Samples 2004-05				Samples 2005-06			
	Failed	Appeals preferred	Retesting allowed	Found std.	Failed	Appeals preferred	Retesting allowed	Found std.	Failed	Appeals preferred	Retesting allowed	Found std.
Central Govt.	272	9	9	5	392	10	10	6	402		108	37
Punjab	65	38	38	22		64	62	27		24	24	11
AP	211	147	147	46		163	163	71		165	165	60
UP	1061	92	92	56	1033	94	124	89	989	79	163	99
Haryana	91	0	0	0		15	15	5		3	3	2

Source: Fertilizer testing data collected by FISME from respective state departments through RTI

The accompanying Table - 6 highlights that 50% of the samples are passed in re-testing. Among rest of the reports, many indicate substantial variation in the contents: nutrient contents found standard in primary testing but reported deficient in retesting and vice versa; nutrient contents reported deficient in primary as well secondary testing however with a vast difference say + 5-15% on either side. Such reports are so unreliable that most of the cases, indeed, cannot stand trial in the court of law.

Some other factors responsible for the low prosecution rates include time-consuming judicial processes, technical difficulties in preparing the cases in courts and inadequate legal support to the fertilizer inspectors. Due to these difficulties, the inspectors prefer to settle the matter outside the legal mechanism, sparing themselves of the administrative and legal hassles. Another crucial issue is that there is no distinction in terms of award of offences as ‘major’ and ‘minor’ nature as discussed earlier; the penal provisions are same for both. This causes minor punishment handed out to the major offender and vice versa.

Delay in disposals of appeal: Another issue is that while filing of appeal is time bound, its disposal is open ended. This leaves room for harassment or compelling some firms to pay illegal gratification, consequently the appellate authority allows the retesting of samples in question. Similarly, the re-testing process is also an open ended exercise.

Other issues: Problems specific to Micronutrient Fertilizers: In addition to the problems discussed in the preceding discussions, there are various issues that plague micro nutrient fertilizers in particular. The MNF industry is almost wholly comprised of firms in the small scale sector. As a matter of fact, Zinc Sulphate had been under Reservation List for exclusive manufacture by small industry till recently. The small nature of enterprises bring weaknesses associated with size, viz. scarcity of time along with inadequate resources to meet the challenges faced in the quality control system. Being small and less resourceful, firms producing MNFs are more vulnerable to excesses of inspectors and therefore much more likely to yield to rent-seeking with fake threats. More particularly, a major set of problems stems from unrealistic specifications and tolerances for micro nutrient compounds. In the specifications of MNFs, besides restricting heavy metals- which is perhaps desirable, even elements like Copper (Cu) and Iron (Fe) are listed as impurities! These elements are, in fact, known as micro nutrients and their presence is essential for enhancing the soil nutrients.

6. Conclusion

The quality of a fertilizer is of huge significance in India where 70% of people are employed in agriculture and on its output depends not only economic prosperity but also the livelihood of millions of Indians. The elaborate quality control mechanism that exists in India ensures identification of producer and seller of fertilizers, specifies types of fertilizer that could be manufactured and sold and arranges for periodic and surprise testing of fertilizers in markets in the special approved laboratories. Nonetheless, concerns have been raised from government and stake holders about the quality of fertilizers being sold in the market, emphasizing the need for revamping the quality mechanism from time to time.

Based on the data provided by the apex institution of Government of India for fertilizers quality- CFQCTI, its reports, data collected through a series of RTI application by FISME from Central and State laboratories and the feedback received from the members of Micronutrient Manufacturers Association, the issue of existing quality control dispensation for fertilizers has been analysed in this report, covering three broad areas: Product and Testing Standards, Testing infrastructure and Administrative mechanism including legal provisions.

We find that there are critical deficiencies in specifications of fertilizers particularly with in micronutrient fertilizers and their mixtures. In some cases these specifications are so rigid that they in fact act against the interests of farmers as some eminently desirable elements are also grouped as impurities. According to the Government's own experts, most of these specifications are arrived at on ad-hoc basis without any detailed field study. The method of testing prescribed under standards has been questioned by experts and is not in consonance with the testing infrastructure available in testing laboratories.

The status of testing infrastructure is also a great cause of serious concern. Not only has it been found to be short of requirement, but is also being managed inefficiently. More importantly, serious concerns have been raised by experts about the level of education and training of analysts at testing laboratories. None of these laboratories is accredited by the NABL to ensure compliance of minimum standards and upkeep of testing equipment. The testing infrastructure looks to be the softest belly of the quality control mechanism and does not induce trust.

Unfortunately, with the disputable specifications, blemished testing infrastructure on the one hand and the administration's unbridled powers for forced closure of business and imprisonment of entrepreneurs on the other hand, conditions have been created where there is ample room for deal making and rent seeking. No wonder, a large number of samples that are failed during the first testing get passed when re-tested. Prosecution rate of offenders is very low and the process is marred with delays. The setting is particularly precarious for small enterprises- chiefly operating in the area of micro nutrients, which because of their low negotiating power acquiesce silently to the demands made by the system.

Clearly, the preceding discussion brings forth that the extent of the prevalence of 'sub-standard' fertilizers is not simply because of malafide intentions of producers but it is symptom of a chronic illness afflicting the fertilizer quality assurance mechanism itself, because of which the problem of quality control is perpetuated, rather than being controlled.

7. Policy Recommendations

Given the fast deteriorating quality of soil across the country leading to stagnation in food production, there is an urgent need to ensure supply of good quality fertilizers. This indicates that there has to be a strong quality control system that effectively deters production and sale of sub-standard fertilizers. From the preceding analysis of the current practices in quality control, some clear policy recommendations follow which are presented in this section. The regulatory system responsible for carrying out the provisions of the FCO is itself flawed. This in turn leads to inefficiencies in the entire quality control mechanism. Efforts should be made in making the regulatory system more efficient, which will automatically improve the functioning of the quality control mechanism.

- **Larger role for the private sector:** The Planning Commission has acknowledged the need to take recourse to the private sector, not just in spreading knowledge and training farmers in integrated nutrient management, but also in setting up testing facilities. This would need to be covered by the FCO so that the tests done by private laboratories can be upheld. This would involve accreditation of private laboratories and benchmarks that should be put in place by regulation.

- **Judicious penalties:** The penalties prescribed by the FCO need to be judicious and moderate. The strict penalties prescribed in the form of imprisonment of up to 7 years should be replaced by moderate punishment like fines. Strict penalties are likely to discourage good quality manufacturers from entering the fertilizer business.

- **Adequate and efficient laboratory facilities:** There should be a sufficient number of laboratories with adequate capacity for testing the samples. The capacity of the laboratories should be proportionate to the number of samples to be utilized. To ensure the excellence of the fertilizer quality control laboratories, it should be made mandatory to get NABL (National Accreditation Board For Testing And Calibration Laboratories) accreditation.

- **Checking deliberate manipulation of test results:** As shown in Table 5 in the earlier section, it has been observed that around 50 percent of the samples failing in the first round eventually passes in the second round. This clearly indicates that the test results are tampered with at some levels, i.e., either at the first round or the second. And there are no evidences to prove this manipulation. This needs to be checked. There should be an efficient check on the fertilizer inspectors who are involved in testing the samples.

- **Transparent system of re-testing:** Detailed information should be easily accessible on the second round testing, for instance, reasons for passing in the second round etc. Ideally, retesting should be conducted in the presence of either the parties or their authorized representatives. Competent persons may be approved to be authorized representatives of the parties. Such competent persons could be lecturers, professors of chemistry department of science or agriculture colleges and universities. In addition, for empowering the consumers, right to test or retest by the parties other than in question should be given.
- **Pragmatic tolerance limits under the FCO:** The ranges of tolerance limits specified by the FCO are not only too stringent but also impractical. The tolerance limits need to be moderate and pragmatic. For instance, the fertilizer samples are usually packed in jute bags while being transported to the laboratories for testing and there is every chance for the moisture content to rise or fall by some points. In this case, even if the fertilizer sample meets all other prescribed limits, it would be classified as a sub standard sample.
- **Making distinction between fraud and negligence:** There is a need to realize the distinction between mistake/ negligence and fraud, i.e. between sub-standard and adulterated fertilizers. The punishment should be more intense in case of adulterated fertilizers- when there is intent to adulterate for economic benefit than the sub standard ones where minor variation occurs in chemical or physical composition due to negligence.
- **Adequate number of full time fertilizer inspectors:** There should be an adequate number of full time fertilizer inspectors who play the lead role in the entire testing process. This will ensure effectiveness of the quality control mechanism.
- **Sufficient attendance in training programmes:** The training programmes are meant for equipping the fertilizer inspectors with the ability to carry out the testing process successfully. Thus, adequate attendance of the inspectors is essential to improve the skills of the inspectors.

- **Addressing flawed sampling pattern:** The faulty sampling pattern prevalent in the present quality control system, where the low likelihood of being substandard fertilizers is tested in inordinate numbers as against the high probability ones, needs to be changed. Here, the role of efficient regulatory system is quite critical. An ideal system of sampling will need to be devised that can appropriately test greater probability of substandard fertilizers more intensively than the low probability ones. Given the low capacities currently prevalent, this issue gains further importance.

- **Making specifications sharp:** The specifications of the various fertilizers should be limited to main nutrient contents and those parameters and/ or impurities which are harmful for agriculture or mankind, and not the physical parameters. This would keep the focus on critical parameters, letting the adoption of a more accommodating stance towards the physical parameters.

- **Popularizing the Rapid Testing Kit:** The Rapid Testing Kit can be an important instrument which gives the farmers the ability to check the quality of fertilizers for themselves on the field. The kit has many limitations in its present form, however, with suitable modifications it has the potential for being an effective deterrent for substandard fertilizers in the market.

To conclude, a three pronged effort is required.

One, making the quality control monitoring and regulatory system more realistic and in line with the technical and organizational imperatives. This requires a more realistic set of standards and a punishment regime that is able to distinguish between different types of sub-standard fertilizers.

Two, making it more efficient. This requires creating larger capacities with better technology and human capital. This requires both investments in infrastructure as well as human capital.

Three, creating the right set of incentives for all stakeholders: producers, inspectors and others involved in monitoring quality. And ensuring that honest persons who do not give in to malpractices are rewarded, not punished.

***

8. List of Annexures

Annexure - 1:	Specifications of Mixtures of Micronutrient Fertilizers as approved by various State Govts.
Annexure - 2:	Month wise samples analysed
Annexure - 3:	State wise number of samples found non standard during 2003-04
Annexure - 4:	State wise number of samples found non standard during 2005-06
Annexure - 5:	State wise number of samples found non standard during 2006-07
Annexure - 6:	State wise / Product wise details of fertilizer samples analysed and found non standard during 2003-04
Annexure - 7:	State wise details of follow up action on non standard samples during 2003-04.
Annexure - 8:	Illustrative Analysis report reporting 198% of moisture with no nutrient deficienciy in SSP!
Annexure - 9:	Illustrative Analysis report: mailed on 8th June; analysed on 9th June reporting physical deficiency
Annexure - 10:	Illustrative Analysis report without date of analysis, reporting failure in physical parameters, (moisture content) with over-writing.

Annexure - 1

Specification of mixture of Micronutrient Fertilizers as approved by various state governments

S.No.	State	Micronutrient Composition (Specification% by weight)	Crops/Soil Recommendation
1	West Bengal	(i) Zn-5.0, B-0.5, Mo- 0.25	Vegetables, Oilseed, Pulses, Wheat, Jute & Flower
2	Orissa	(i) Zn-7.0, Fe- 0.50, Mn -2.0, Cu-1.00, B-0.5 Mo-0.005	
3	Bihar	(i) Zn- 3.0, Fe- 0.50, Mn-0.2, Cu-0.50,B- 0.5, Mo- 0.02	
		(ii) Zn- 8.0, Mg-8.0, Fe- 1.0, Mn-0.2, Cu-1.00, B- 1.0, Mo-0.03	
4	Karnataka	(i) Zn- 3.0, Fe- 2.00, Mn-1, B- 0.5	
		(ii) Zn- 3.0, Fe- 0.05, Mn-0.2, B- 0.5	
		(iii) Zn- 3.0, B-0.05	Black Soil alkaline reaction Red and late rite soil with acidic reaction Hilly and coastal region with acidic pH
5	Gujarat	(i) Zn-4.0, Fe-2.0, Mn-0.5, Cu-0.3, B-0.5	
6	Andhra Pradesh	(i) Zn- 5.0, Fe- 6.0, Mn-1.5	
		(ii) Zn- 6.0, Fe- 2.0, Mn-3.0, B- 0.5	
		(iii) Zn-6.0, Fe-4.0, Mn-3.0, Cu-1.0, B- 2.0, Mo- 0.05	
		(iv) Zn-5.0, Fe-1.00, Mn-1.0, B- 0.5	
		(v) Zn-6.0, Fe-2.0, Mn-3.0, B-0.5	Paddy, Groundnuts & Sugarcane Oilseeds & Pulses Citrus Grapes Vegetable & Cotton
7	Rajasthan	(i) Zn-5.0, Fe- 2.00, Mn -2.0, Cu-0.50, B-0.5 Mo-0.005	For all Crops
8	Punjab	(i) Zn- 4.0, Mn-15, Mg-1.5	
		(ii) Zn-5.0, Fe-7.5, Mg-0.5	
		(vi) Zn-6.5, Fe-3.5, Mn-3.0, Mg-1.0	
9	Uttarakhand	(i) Zn- 4.0, Cu- 0.5, Fe- 2, Mn-0.5	
		(ii) Zn- 3.0, Cu- 0.5, Fe- 1.5, B-0.5	
		(iii) Zn- 3.0, Cu- 0.5, Fe- 2, Mn-0.5	Wheat, Rice & Cereals Vegetable & Crops All Cereals
10	Himachal Pradesh	(i) Zn-2.0, Mn -0.5,Cu-0.5, B-1.0, Mo-0.02, Ca-1.0	
		(ii) Zn-2.0, Mn -2.0, Cu-0.5, B-1.5, Mo-0.01, Mg-1.0	Fruits Sub tropical fruit and Vegetable
11	Uttar Pradesh	(i) Zn-10.0, Fe -5.0,Cu-1.0, Mn- 2.0, B-1.0,	
		(ii) Zn-6.0, Fe-3.0, Cu-0.5, Mn-1.5	
		(iii) Zn-6.0, Fe-3.0, Cu-1.0, Mn-1.5, B-1.0	

Annexure - 2

Month-wise samples analysed

UTTAR PRADESH

Alam Bagh, Lucknow

Capacity: Annual 5500 Monthly 459

Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
2005-06						227	328	103	**675**	**1716**	83	124
2006-07	50	85	172	212	**820**	**1306**	451	**864**	367	432	**546**	236
2007-08	72	14	363	**1052**	247	186	247	**492**	**1018**	**869**	144	67
2008-09	60	19	117	170	**1185**	**503**	351					

Rehman Kheda, Lucknow

Capacity: Annual 1500 Monthly 125

Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
2005-06	42			33	**196**	55	40	76	63	104	21	26
2006-07			5	25	73	55	121	84	102		10	15
2007-08			12	64	31	16	27	23	**129**	102	5	6
2008-09			1	60	110	71						

Varanasi

Capacity: Annual 3000 Monthly 250

Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
2005-06	21	26	69	170	**441**	145	175	151	**542**	**676**	40	35
2006-07	11	7	213	128	246	**499**	147	**428**	**343**	223	137	7
2007-08	6		249	**578**	61	83	112	**264**	**491**	**451**	60	49
2008-09	36	20	84	193	**436**	106	130					

Meerut

Capacity: Annual 3000 Monthly 250

Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
2005-06						26	71	72	**534**	**450**	34	26
2006-07		7	68	95	**304**	**523**	95	**337**	**440**	175	173	51
2007-08	2	1	169	**416**	65	139	122	232	**365**	**398**	43	33
2008-09	11	11	105	146	**334**	142	156					

KARNATAKA

Gangavathi

Capacity: Annual 2400 Monthly 200

Year	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
2005-06						202	171	85	94	107	65	133
2006-07	19	13	15	162	174	174	182	146	147	72	123	121
2007-08		16	**308**	154	147	157	86	109	68	117	69	79
2008-09	6	8	145	143	163							

Dharwad

Capacity: Annual 2400 Monthly 200

Year	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
2005-06						**248**	175	154	166	137	150	95
2006-07	9	63	177	189	**247**	**210**	**203**	154	193	145	91	62
2007-08	12	60	116	**212**	**247**	105	80	181	176	83	110	104
2008-09	10	61	164	**212**	**203**							

Source: Fertilizer and pesticides quality control laboratory, Alambag, Lucknow

Note: Total capacity of the laboratory – 460 samples per month

Annexure - 3

State wise number samples found non standard, 2003-04

State	Nonstandard samples due to nutrient deficiency (%)	Nonstandard samples due to physicals parameters and Impurities (%)
Assam	100	0
Jharkhand	100	0
Bihar	77	23
Orissa	81	19
West Bengal	73	27
Gujarat	95	5
Madhya Pradesh	86	14
Chhattisgarh	100	0
Maharashtra	67	33
Rajasthan	91	9
Haryana	100	0
Himachal Pradesh	100	0
Jammu Kashmir	67	33
Punjab	100	0
Utter Pradesh	100	0
Uttarakhand	100	0
Andhra Pradesh	87	13
Karnataka	51	49
Kerala	98	2
Tamil Nadu	55	45
Total India	80	20

Source: Federation of Indian Micro and Small & Medium Enterprises

Annexure - 4

State wise number samples found non standard, 2005-06

State	Nonstandard samples due to nutrient deficiency (%)	Nonstandard samples due to physicals parameters and Impurities (%)
Assam	100	0
Jharkhand	100	0
Bihar	100	0
Orissa	84	16
West Bengal	98	2
Gujarat	100	0
Madhya Pradesh	75	25
Chhattisgarh	100	0
Maharashtra	79	21
Rajasthan	88	12
Haryana	63	38
Himachal Pradesh	98	2
Jammu Kashmir	89	11
Punjab	100	0
Utter Pradesh	100	0
Uttarakhand	89	11
Andhra Pradesh	100	0
Karnataka	84	16
Kerala	95	5
Tamil Nadu	68	32
Total ALL India	83	17

Source: Federation of Indian Micro and Small & Medium Enterprises

Annexure - 5

State wise number samples found non standard, 2006-07

State	Nonstandard samples due to nutrient deficiency (%)	Nonstandard samples due to physicals parameters and Impurities (%)
Assam	100	0
Jharkhand	100	0
Bihar	100	0
Orissa	64	36
West Bengal	99	1
Gujarat	97	3
Maharashtra	87	13
Rajasthan	90	10
Haryana	77	23
Himachal Pradesh	94	6
Jammu Kashmir	95	5
Utter Pradesh	100	0
Uttarakhand	96	4
Andhra Pradesh	83	17
Karnataka	83	17
Kerala	96	4
Pondicherry	100	0
Tamil Nadu	64	36
Total ALL India	88	12

Source: Federation of Indian Micro and Small & Medium Enterprises

Annexure - 6

STATEWISE/PRODUCTWISE DETAILS OF FERTILISER SAMPLES ANALYSED & FOUND NON STANDARD DURING 2003-04

S.No.	Name of State	Urea/A/S & A/Cl		CAN		SSP		DAP		MOP/SOP		NPK(C)		NPK(M)		MNF		Others		Total	
		*An.	**NS	An.	NS	An.	NS	An.	NS	An.	NS	An.	NS	An.	NS	An.	NS	An.	NS	An.	NS
1	Assam	18	0	0	0	14	1	18	0	15	0	1	0	0	0	10	0	-	-	76	1
2	Bihar	228	1	0	0	148	20	222	15	135	0	12	4	102	15	-	-	26	5	861	56
3	Jharkhand	169	0	0	0	26	0	177	0	33	0	27	2	0	0	0	0	0	0	432	2
4	Orissa	655	2	12	11	221	1	381	36	408	23	308	27	48	6	-	-	601	33	2534	139
5	West Bengal	703	3	5	0	603	150	501	39	531	44	664	50	25	22	94	33	53	0	3180	341
6	Mizoram	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Gujarat	3045	0	178	0	463	25	2230	15	485	2	1464	19	214	34	188	12	0	0	8267	107
8	M.P.	890	120	7	2	1419	506	1750	256	226	17	834	91	-	-	7	1	-	-	5060	1015
9	Chhatisgarh	494	10	1	0	745	49	280	14	218	0	269	19	0	0	0	0	0	0	2007	92
10	Maharashtra	491	6	8	0	4531	222	365	16	147	5	1368	73	4945	623	-	-	290	37	12145	1069
11	Rajasthan	1106	1	32	0	1029	84	1793	17	239	0	186	1	91	0	0	0	195	13	4671	116
12	Haryana	328	22	4	0	145	6	1959	55	163	1	159	0	42	1	284	6	0	0	3082	91
13	H.P.	585	0	95	0	156	0	39	6	48	0	394	0	0	0	18	3	0	0	1335	9
14	J&K	799	0	0	0	0	0	353	0	54	1	4	0	0	0	0	0	3	2	1268	3
15	Punjab	71	0	7	0	68	7	1864	36	358	0	182	8	0	0	913	9	62	5	3525	65
16	U.P.	1100	22	0	0	761	204	5082	361	1402	15	1592	178	55	10	834	236	272	35	11098	1061
17	Uttaranchal	134	9	-	-	6	0	74	3	48	0	78	1	34	1	35	4	-	-	396	12
18	A.P.	639	0	5	0	1214	51	1337	5	619	3	2613	43	221	0	963	78	1596	31	9207	211
19	Karnataka	1012	2	5	0	138	15	1172	18	495	118	1625	126	188	32	162	14	1075	22	5872	347
20	Kerala	1128	11	0	0	31	0	40	13	1148	15	969	86	455	107	35	0	549	32	4355	255
21	Pondicherry	129	0	0	0	29	0	52	0	55	0	98	0	156	0	0	0	0	0	519	0
22	Tamil Nadu	5416	22	7	0	982	21	2700	15	2637	1	3341	266	1476	177	445	4	24	0	17028	516
	Govt. Of India	643	7	14	0	211	82	1067	48	5147	8	320	38	49	26	203	65	75	3	7729	277
	Grand Total	19783	238	380	13	12940	1444	23456	968	14611	253	16508	1032	8101	1054	4191	465	4821	218	104647	5785
	% NS samples		1%		3%		11%		4%		2%		6%		13%		11%		5%		6%
	* An- Analysed																				

Annexure - 7

STATEWISE DETAILS OF FOLLOW UP ACTION ON NON STANDARD SAMPLES DUSRING 2003-04

S.No.	Name of State	Non Std. Sample	Charging higher price	Administrative Action			Seizure of stock/ stop sale	Disposal allowed under Cl.23	Prosecution launched	Conviction awarded	Case pending in court	Cases pending for action	No. of cases other violation of FCO
				DRC Cancelled	DRC Suspended	Other action							
1	Assam	1	0	0	0	0	0	0	0	0	0	0	0
2	Bihar	56											
3	Jharkhand	2	0	0	0	0	0	0	0	0	0	0	0
4	Orissa	139		9		138							13
5	West Bengal	341	0	1	-	341	-	-	1	-	-	-	-
6	Mizoram	0											
7	Gujarat	107	1	4	0	92	14	0	20	0	293	28	4
8	M.P.	1015		271		670	56	31	8		8		
9	Chattisgarh	92	-	-	-		-	-	-	-	-	-	-
10	Maharashtra	1069		2		635	2					125	-
11	Rajasthan	116				116	2		3		3		
12	Haryana	91	0	3	0	2	0	0	6	0	2	2	0
13	H.P.	9	0	0	0	0	0	0	0	0	0	0	
14	J&K	3	3	-	-	-	-	-	11	-	-	-	11
15	Punjab	65	0	23	0	0	0	0	0	0	0	65	0
16	U.P.	1061	0	750	0	0	12.7 mt	0	43	0	32	0	105
17	Uttaranchal	12		8		3	2				1		
18	A.P.	211	0	4	0	96	2	0	22	0	0	85	2
19	Karnataka	347	0	0	0	44	0	0	0	0	0	303	0
20	Kerala	255											
21	Pondicherry	0	0	0	0	0	0	0	0	0	0	0	0
22	Tamil Nadu	516	4	31	10	19			3	1		240	150
	Total	**5508**	**8**	**1106**	**10**	**2156**	**79**	**31**	**117**	**1**	**339**	**848**	**285**

Annexure - 8

S. No - 136 (L)

Govt. of India
Ministry of Agriculture
Department of Agriculture & Cooperation
Regional Fertilizer Control Laboratory
Kalyani: Nadia: W.B:741235:Telefax:033-25829291

/1

FORM 'L'
(See Clause 30(2))

Sl.No.1339

ANALYSIS REPORT OF FERTILISER SAMPLE

No.8-2/2003/RFCL

Date: 28.11.03

To
The Joint Director of Agriculture(QC),Rajasthan, Jaipur.

The analysis report of the fertilizer sample forwarded by you, vide your Letter no F6( )D.Ag/Q.C/2003-04/2952 dt 23.10.03 is as per details given below:-

(1) Name of fertilizer, grade	:	SSP(G) 16% W.S P_2O_5
(2) Date of sampling	:	22.10.03
(3) Omitted	:	
(4) Code No. of sample as indicated by the Inspector	:	Jt.D.Ag(Q.C)-22
(5) Date of receipt of sample in the laboratory	:	3.11.03
(6) Laboratory sample No.	:	1149/03
(7) Date of analysis of sample	:	27.11.03

(8) Chemical analysis of fertilizer(on fresh weight basis except in the case of Urea on dry weight basis)

Sl.No.	Specification As per FCO (%)	Composition as per analysis(%)	Variation	Permissible Tolerance Limit
(i)	Moisture 5.0(max)	9.92	+4.92	(+) 0.3 Unit
(ii)	Total N			
(iii)	NH_4N			
(iv)	NH_4NO_3 N			
(v)	Urea N			
(vi)	Total P_2O_5			
(vii)	Neutral ammn. citrate sol. P_2O_5			
(viii)	Citric acid soluble P_2O_5			
(ix)	Water Sol. P_2O_5 16.0(min)	16.48		
(x)	Water sol. K_2O			
(x)	Particle Size:			
	-4.0mm +1.0mm 90% (min)	99.19		
	+4.00mm	0.32		
	-1.0mm 5%(max)	0.49		
(xii)	Others: Free Phosphoric Acid (as P_2O_5) 4.0(max)	2.24		

NON STANDARD

Remarks: The sample ~~is~~/ is not-according to specifications and fails in Moisture.

Copy to:

1. The Director of Agriculture, Govt. of Rajasthan,Jaipur.
2. The Director,CFQCTI, Faridabad,121001.

P.Shukla

O/C INCHARGE
R F C L, KALYANI.

P. D. SHUKLA, SENIOR ANALYST
GOVT. OF INDIA, MIN. OF AGRIL.
DEPTT. OF AGRIL. & COOPN.
RFCL, KALYANI, NADIA, W. B.

Annexure - 9

सत्यमेव जयते

Govt. of India
Ministry of Agriculture
Department of Agriculture & Cooperation
Regional Fertilizer Control Laboratory
Kalyani: Nadia:W.B:741235:Telefax:033-25829291

Sl.No.60

FORM 'L'
(See Clause 30(2))

ANALYSIS REPORT OF FERTILISER SAMPLE

No.8-2/2005/RFCL /354-56 — Date: 9.6.05 — 08 JUN 2005

To
The District Agriculture Officer, Purnea, Bihar.

The analysis report of the fertilizer sample forwarded by you vide your Letter Sl.no.243, Dt.10.5.05 is as per details given below:-

(1) Name of fertilizer, grade : DAP 18% N, 46% P_2O_5
(2) Date of sampling : 9.5.05
(3) Omitted :
(4) Code No. of sample as indicated by the Inspector : OP 68/1
(5) Date of receipt of sample in the laboratory : 18.5.05
(6) Laboratory sample No. : 522/05
(7) Date of analysis of sample : 9.6.05 — 08 JUN 2005
(8) Chemical analysis of fertilizer (on fresh weight basis except in the case of Urea on dry weight basis)

Sl.No.	Specification As per FCO (%)	Composition as per analysis (%)	Variation	Permissible Tolerance Limit.
(i)	Moisture 1.5(max)	1.20		
(ii)	Total N 18.0(min)	18.37		
(iii)	NH_4N 15.5(min)	17.25		
(iv)	NH_4NO_3 N			
(v)	Urea N 2.5(max)	1.12		
(vi)	Total P_2O_5			
(vii)	Neutral ammn. citrate sol. P_2O_5 46.0(min)	46.20		
(viii)	Citric acid soluble P_2O_5			
(ix)	Water Sol. P_2O_5 41.0(min)	42.39		
(x)	Water sol. K_2O			
(xi)	Particle Size:			
	-4.0mm +1.0mm 90%(min)	76.63	(-)13.37	3.00
	+4.00mm	23.37		
	-1.00mm 5% (max)	Nil		
xii)	Others:			

Remarks: The sample ~~is~~/ is not according to specifications and fails w.r.t. PS.

Copy to:
1. The Director of Agriculture, Govt. of Bihar, Vikas Bhavan, Patna, Bihar.
2. The Director, CFQCTI, Faridabad, 121001.

INCHARGE
RFCL Kalyani.

Annexure - 10

GOVERNMENT OF WEST BENGAL

OFFICE OF THE AGRICULTURAL CHEMIST, WEST BENGAL

230A, Netaji Subhas Chandra Bose Road, Kolkata-700 040

FORM 'L'

[See Clause 30 (2)]

Memo No. 268(2) F/03-04 ANALYSIS REPORT OF FERTILISER SAMPLE Date: 11.8.03

To
The Fertiliser Inspector, ADO, Gosaba
P.O.- Gosaba 24 Pg (S).

The Analysis report of the fertiliser sample forwarded vide PAO/SAO/SMS/ADO's Gosaba Reference No. 175 Dated 3.7.03 is as per details given below.

1. Name of the fertiliser, grade and brand MOP.
2. Date of sampling 3.7.03.
3. Serial No. of sample as indicated by the Inspector 3/1 / K20 - 1/03-04.
4. Code No. of sample as indicated by the Inspector -
5. Date of receipt of the sample in the laboratory 29.7.03
6. Laboratory sample No. J.273
7. Date of analysis of sample
8. Chemical analysis of fertiliser (on fresh weight basis except in the case of Urea on dry weight basis)

Sl. No. (1)	Specification as per F.C.O (2)	Composition as per analysis (3)	Variation (4)	Permissible tolerance limit (5)
(i) Moisture	0.5% (Max)	1.40%	(+) 0.9%	Nutrient - 0.2 Moisture - 0.3 P. size - 3.0 Non Standard in respect to Moisture.
(ii) Total N				
(iii) NH_4N				
(iv) NH_4NO_3N				
(v) Urea N				
(vi) Total P_2O_5				
(vii) Neutral Ammonium Citrate soluble P_2O_5				
(viii) Citric Acid soluble P_2O_5				
(ix) Water soluble P_2O_5				
(x) Water soluble K_2O	60% (Min)	60.0%		
(xi) Particle size				
on 4.0/2.8/12.2/1.7mm	35% (Max)	-		
on 1.0/9.5/2.0/0.25mm	65% (Min)	100%		
Pass through 1.0/9.5/2.0/0.25mm	-	-		
(xii) Others				
(a) Free Phosporic Acid				
(b) Biuret				
(c) Sodium as Nacl				
(d) Free acidity as H_2SO_4				

Remarks : The sample is/is not according to specification.

Copy to : PAO/SAO

Director of Agricultural & Ex-Officio Secretary,
Agriculture Department, Govt. of West Bengal,
Writers' Building, Kolkata-700 001.

11/8/03

Signature of the Incharge
Fertiliser Quality Control Laboratory
Tollygunge, Kolkata.

FISME POLICY PAPERS

FISME Policy papers form the troika of series of publications focusing a distinct set of issues. All papers are research based and are intended to induce a more informed debate on issues of contemporary importance in SME space in India.

Trade Issue Series

Indian Economy is increasingly getting integrated with global economy. The process is resulting in a whole new set of opportunities and challenges for SMEs. The Trade Issue Series is an attempt to look at the emerging trade issues from the perspective of SMEs with an objective to strategize gains and minimize pains for them.

SME Policy Series

The series focuses on issues of policy and regulatory environment for SMEs in India, brings forth best practices and aims to contribute to creation of enabling environment for development and growth of entrepreneurs in India.

Occasional Paper Series

The Occasional Papers dwell upon issues that have wider implications for India. The series probes the complex socio-economic political issues where in SMEs are major stakeholders.

FEDERATION OF INDIAN MICRO AND SMALL & MEDIUM ENTERPRISES (FISME) - AN INTRODUCTION

FISME came into being in 1995 as a Federation of geographical and sectoral associations of Small and Medium Enterprises (SMEs) in India spread across districts and states. It was established as National Alliance of Young Entrepreneurs (NAYE) in 1967- when Indian government started monumental initiatives for small industry promotion. India was a different country then, inward looking, interventionist and hugely protectionist. NAYE had a contextual agenda which suited that era. After India's embarking upon liberalization in 1991 and its accession to WTO in 1995, it called for a fundamentally different approach for SME promotion. NAYE along with 8 state level associations gave birth to FISME to lead SMEs in the changed economic realities.

Its mindset, mission and activities have been shaped by these national and global developments. It focuses primarily on trade and market access issues and reforms with the twin objective of establishing entrepreneurial and competitive environment at home and greater market access for Indian SMEs in India and abroad.

The key thematic areas of work at FISME constitute:

a. Internationalization of SMEs- which reflects in our activities such as networking with SME associations abroad and organization of trade fairs, trade delegations, hand-holding-training, BDS development among others.

b. Mainstreaming of trade issues among SMEs and their associations - engaging us in continuous research, sensitization on trade issues and organization of collective initiatives

c. Strong orientation for reforms in regulatory environment and promotional policies in tune with changing world trade order to enhance competitiveness of SMEs vis-a-vis their larger domestic counterparts and foreign firms-engaging us in research, bringing out policy and position papers and organization of campaigns.

FISME is widely perceived as the progressive face of Indian SMEs and is regarded as such by Government of India. Member of quasi-judicial body of 'Advisory Committee' formed under MSME Act 2006 and Member of Board of Trade (Ministry of Commerce and Industry), it is well represented in and consulted by SME policy making set up in the country. FISME works in close cooperation with major multilateral and bilateral bodies in India UNIDO, ILO, UNCTAD, DFID, GTZ among others.

Currently, as Tier-I partner, it is leading 22 provincial SME bodies (in 18 states) under multilateral project 'Strategies and preparedness for trade and globalization in India' supported by UNCTAD, DFID and Ministry of Commerce & Industry.

More at http://www.fisme.org.in