



# A Great Find in Life Science Study

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## Abstract

Character net system of yield performance was firstly found and determined, and secret of both life activity and product yield forming was revealed in higher plant on both individual stratum and community stratum. The key point and point of starting off forming this theory system were basic principle of contradiction and its movement between adaptive ability of life body self for all of environment factors and its yield ability (or yield potential). It was a great breakthrough for classical formula, Phenotype = Genotype + Environment since more than one hundred years. Several research methods, abstracting and generalizing and test, axiom way should be used in study of this theory system, these methods could not all be lacked, and this net system could be succeeded. This net system was a integration of all of closely related subject knowledge, and was a life body to be compounded by these science knowledge. It will greatly promote development of these related subjects and related applied science and applied technology. It will be a certainly important theory basis of study of molecular biology and molecular genetics or molecular physiology. It was milestone transforming experience breeding into scientific breeding of living things, also transition milestone from Mendel's genetics that could only explained quality characteristics inheritance into both quality and quantity, transition milestone from small workshop type of breeding into collective engineering of technique system, transition milestone from art into science. It initiated a revolutionary road of breeding of living things.

## Keywords

Life, Scientific Research, Find

**Subject Areas:** Agricultural Science

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## 1. Introduction

Significance of studying problem, “How were formed yield and quality of biological product”, was very great. Only by determining and grasping this basic principle or internal regularity of existing and development of organisms, could people have regulation or principle to follow in improving biological varieties, have overall situation in heart, comprehensively and scientifically analyze and research the problem, have initiative right, and

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enhance the efficiency and level of improvement. Only when people grasped this natural regulation of organisms, could they control the development direction of them, create new improvement technique, and promote development of production. One most important task of scientific research was creating new theory, this was decided by law of scientific development. Studying natural regular of organisms and revealing internal situation was the most important study content. Creating new theory will greatly promote development of relative subjects and applying technology.

Studying and determining this natural regular were more difficult than that of any physical or chemical phenomenon, because complicated relationship among several hundred thousand genes was very hard to imagine. At present, it could only start from studying of relationships among external characters in normal environment to determine the relationship among genes. Except this, there wasn't other road to go, only untiring trying hard and thinking deeply could have possibility. This paper reported research results on forming regular of plant product yield through thirty one years.

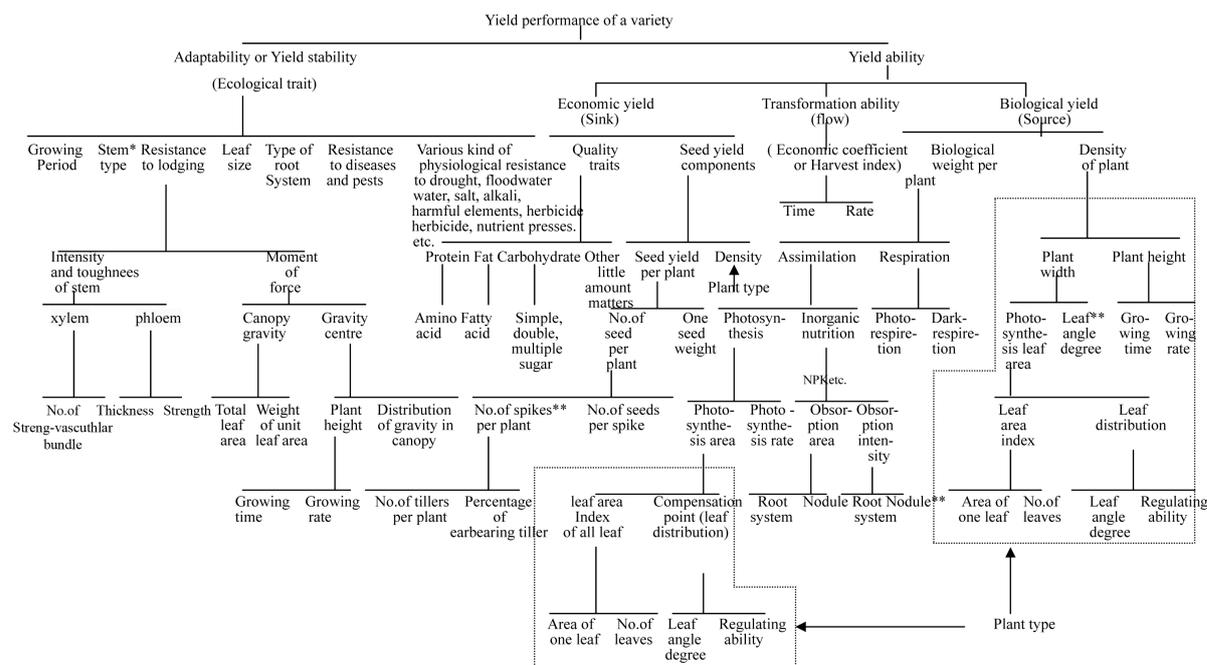
## 2. Setting up Process of Net System of Character Component of Yield

### Manifestation

Basis contradiction [1] of yield performance of crop variety was first issued in 1975. A not complete character net system was published in 1986 [2]. Seed quality characters were admitted in the net system in 2005, and a complete character net system, or theory system [3] including more than one hundred characters was set up (Figure 1). A works, "Theoretical Genetics and Breeding Science" was published in 2014, and in the book how to recognize a new crop breeding and do good in crop breeding were expounded on basis of the net system.

## 3. Why This Net System Was a Great Find of Life Science Study

Net system of character component of yield performance of crops, or theory system of theoretical genetics and breeding science of crops, or basic principle of crop breeding, or the real situation of live activity of crop crowd body, were all same a thing. It was even though from studying crop variety, if this principle was used for reference basic principle of forming yield or product of any higher living should be obtained, if it was suitable simplified basic principle of subsistence ability and reproduction ability of lower living things was formed, if part



**Figure 1.** Net system of basic contradiction of variety yield performance and characteristic composition of crops. \*The stem type was pod bearing habit in soybean. \*\*There were petiole (and its length) and nodule, No. of pod per plant, No. of seed per pod in soybean.

under “plant density” was canceled it should apply to product by form of any individual production, even study human also should start from basic contradiction between adaptability (including adaptability for environment conditions of nature, daily life, production or labor or work, and society) and labor potential (corresponding to yield ability of individual plant, including abilities of study, thinking, creating). So it was basic principle explaining all life activity, mystery of life activity and forming product yield were revealed on two strata of individual and crowd, and this was a dream of many scientific workers. For example “Genetics Net Explanation of Yield Characters of Main Crops”, a plan of great item of scientific research and its support fund 1.35 hundred million Yuan RMB were published by Natural Science fund Committee of China in 2014. Peoples desired that such basic principle was early revealed, so it was a great problem of life scientific study, and once it was revealed, it should be great find.

#### 4. Basic Contradiction of Yield Performance and Its Importance

Basic principle of yield performance [1] was that contradiction and its movement between adaptive ability of life body self for all of environment factors and its yield ability (or yield potential, was the yield under the most suitable environment for a variety) was published in 1975. This basic principle applied to every living body, and was basic theory of subsistence ability and reproduction ability of life body, key and basis forming this character net system or theory system (Figure 2)

This new theory broke through restriction of old genetics formula, was a great breakthrough for the classics formula “Phenotype = Genotype + Environment” that continued more than one hundred years on classroom in university of the world. Because people abode over a long period of time this old theory, breakthrough point founding new theory could not be found. In new formula, internal contradiction component in a genotype was point out, establishing basis for founding character net system, looking for point off starting founding new theory system, and looking for proper seat for differentiating character nature.

Some scholars had attempted setting up genetics net system of yield characters, but expectation result could not be realized, a important reason was first looking not for this basic contradiction, losing key and starting points forming theory system.

Besides, mistake of confusing two types of different nature character easier happened.

#### 5. Necessarily Practicing Mutual Coordination of Several Methods of Research, Only Using Test Method It Could Not be Completed

If problem of research method could not be solved, objective of research could not certainly be reached. In studying this new theory system, some different methods of research, abstracting and generalizing and test, axiom way [4] could be necessarily used, and anyone could not be lacked. If only getting used to test method or supersaturation for any compute method, expectation result could not be obtained. This was most difficult place in founding this theory system.

First, basic contradiction of forming yield performance was raised on basis a lot of phenomenon through abstracting and generalizing [1]. Second, relationship between ecological characters and yield stability was researched through yield test of allelic lines in multiple years, and ecological suitability theory was raised [5]-[9]. Thirdly yield ability characters and reciprocal relationships were determined and theory of yield ability of crops was completed on basis of some research accomplishments of crop physiology and observation, analysis and studying, using axiom method.

When quite abundant practice knowledge was accumulated and became a systematic and perfect theory, axiom way was a valid measure [4]. But it was very difficult to find people that known and applied it in research of living science.

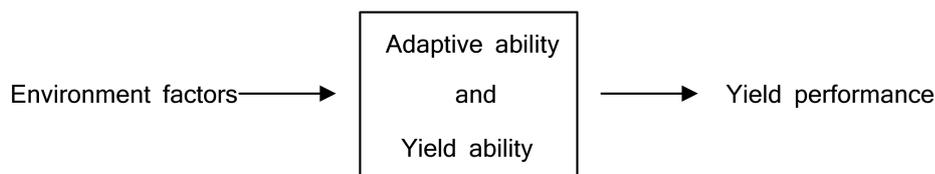


Figure 2. Basic contradiction of yield display of a variety: adaptive ability yield ability.

## 6. This Net System Was Integration of Knowledge of Multiple Subject, a Life Body Synthesizing by Scientific Knowledge

In the character net system, plant organ and its function and metabolism peculiarity etc. were synthesized into a organic body and whole essential factors of yield performance were included. Knowledge of more than ten subjects becoming divided from a life body was embodied in the yield forming system, conversely the knowledge was anew restored into a living organism.

This net system included mainly list subject knowledge:

Ecology: climatic and atmospheric factor, disease and pests, soil, forming reason of ecological suitability characters and its yield stability action. Physiological: metabolisms and theses reciprocal relationship. Variety and Crop cultivation: crowd yield and agronomic characters. Botany: botanical organs and function. Botanical Morphology: relationship among organ morphology difference and ecological or physiological characters, plant type problem. Physical: mechanics principle and analysis of resistance to lodging. Chemical: quality characters of seeds.

A life body, a complicated crowd of higher plant was expressed in the net system, and this system necessarily became epigenetics, molecule genetics basis, biology and molecule biology basis. For example, characters controlled by a single gene had direct effect on ecological suitability, had not subordinate character or had a little and were consistent with its simple inheritance relationship. Yield ability characters were quantitative character and were in more layer net system, and consistent with its complicated inheritance relationship.

In process of character (gene) express, any one character (gene) in this net system formed all contradictions and its movement of energy distribution with other anyone (or several, or more) through different ways, at last a body or crowd having certain energy level was produced as a whole in relational balance.

So this net system was both biological system and genetic system, also physiological system that was more complete and had life power. Also molecule physiology system, molecule biological system and molecule genetics system, Research of molecule biology and molecule genetics, molecule physiology should be conducted on basis of the net system, and was better developed.

Basic law of scientific development, “crisscross and combination between subject or theory to found new subject or new theory, high unify of opposition between theory and practice” was full embodied in setting up the theory system. It promoted certainly development of all of related subjects.

## 7. New Theory System Will Largely Promote Development of Related Applying Technique Subjects and Applying Technique

The theory system was principle controlling life action in biological body, theory basis of research of applying technology, the real situation of life action, also basic principle and basis of technique Science enhancing whole level of biological body. Applying it to guide technique practice could promote development of biological breeding and plant cultivation, animal breeding and breed technique. For example of crop breeding, a main stream in yield ability breeding was improving plant type and going to way of density plant-more ear type, but basing above principle it was not only way, going to way of big ear type or middle type, high yield ability variety could also bred. Author bred new soybean varieties of both more stem (ear) type and main stem (big ear) type, and its yield ability exceeded fifty hundred kg/hm<sup>2</sup>, reached advanced level in China [10]-[12], and on above basic principle raised development road that main objective of two extreme types, more ear type and big ear type, was necessarily persisted and middle type was guided. This was only correct road, also basic regularity of plant breeding.

## 8. Leadership Roles for Improving Future Study of Plant Breeding

On basis of above net system all of links of study work and concrete study content of relative plant breeding could be improved, making them more scientific and reasonable.

Reforming setting up of study room or group of breeding in modern plant research institute, putting into practice combination of applying-basic study with applying technique research, abandoning not reasonable setting up, for example setting up study room of ecological breeding, study room of yield ability, study room of synthetic breeding etc.

Improving present breeding objective and direction making breeding objective both being in frame of theory system and according with practice in this locality, for example setting up in yield ability breeding transforma-

tion ability breeding, biological yield breeding etc.

Revising mistake and blurred recognizing in relative theory in the past. for example high-yielding breeding, plant type breeding, ecological breeding etc concepts, and correct summarizing for synthetic breeding objective etc.

Anew determining basic regular of plant breeding, for example, in economic yield breeding, selection for two extreme types (most ear type, biggest ear type) should be first accomplished, and enhancing and development of middle type could be guided.

Strengthening breeding direction of more important characters in theory system, but ignored characters in practice, for example economic coefficient breeding, plant type breeding of dicotyledon.

Correctly handling relationship among different direction of breeding, for example, using regular of big and small cycle of breeding, improving economic yield character on basis of plant type improvement.

## 9. Conclusions

Basic law of subsistence and development of living things was firstly determined using method of analyzing basic contradiction, this was basic contradiction principle between ecological suitability for environment factors and yield ability (or reproduction ability). Secondly ecological suitability characters and its influence on yield stability were determined and new ecological theory was formed using test method of allelic line. Thirdly multiple basis subject knowledge and practice knowledge becoming divided from living research was again combined, yield ability characters were determined, yield ability theory was formed. The net system of character component of yield performance was set up on both individual stratum and community stratum. It was basic principle of studying living organism, also important theory basis of research on molecule stratum.

It was milestone transforming experience breeding into scientific breeding of living things, also transition milestone from Mendel's genetics that could only explained quality characteristics inheritance into both quality and quantity, transition milestone from small workshop type of breeding into collective engineering of technique system, transition milestone from art into science. It initiated a revolutionary road of breeding of living things.

The theory system setting up by author from research practice in forty years showed that ideal of a scientist was realized at last.

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