

Smart, Alive and Enthusiastic (RACY) Nature Agriculture an Incredible Preceding Innovation to Stand Ever Superb Over Visionary Agriculture & Food System to 2050 and Beyond

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Abstract – Smart, alive and enthusiastic (RACY) nature with scientific innovation for creating weed management problem free, low irrigation water use and green chemistry prudent agriculture system was developed, which will ever stands surpassing futuristic visionary Agri-Food system in 2050 and beyond. The RACY nature agriculture comprises all best known results based on long term research results, innovative application of scientific facts of plant science, soil science, physics, chemistry, environmental science and environmental engineering and brought almost four generations (4G) advancements. The RACY nature agriculture system is applicable for all crops, cropping practices and both irrigated and dry land agriculture ecosystem of any developed or developing economy, remain free of any discrepancy and inadequacy, such good feature which is not likely to come in the agriculture system in the vision to come by 2050, revealing global trend, challenge and opportunities. Further, refinements have been brought in almost all components practices and operations, which produced unimaginably high yield of crops on farmers' fields. Thus, what is in the worldly vision to come in 2050 it has already been developed, substantiated and brought out in India since 2013. The present scientific innovations will always stand as front runner in agriculture domain. In spite of involvement of little budget, this nature agriculture system will overshadow the discrepant technological advancements that have been created or will come up in future.

Keywords – Agric and Food system, Environment and Panacea Solution in Agriculture, Nature Agriculture, Research Advancements, Weed Management.

I. INTRODUCTION

Agriculture had been the main stake for production of food at large and all nations in the world have devised and relied on their agriculture systems. There have been situation of surplus and deficit of food supply in different countries. The global population has increased and is projected to be over nine billion by year 2050. The large population is reasoned to cause excessive anthropogenic emission of green house gases that disturbed and altered trends of season, rainfall, soil erosion, siltation and frequent extremes of hydrologic situations. This has created a matter of worry for global sufficiency and sustainability of food and agriculture.

Research and technologists have been endeavouring to develop innovative systems of agriculture to overcome the emerging bad situations [1] and improve upon it for creating betterment of it. Now a scenario], (Shiraj and

Pingal, 2018) [2] has been displayed indicating global trend, challenges and opportunities depicted in Fig 1. It is claimed to be visionary aspiration and path setter for world agriculture and food systems, while it is aspiring; it has several discrepancies and creating unpleasant situations.

There do exist other scientific researches which presented incredible innovations that produced results superior to what will come due to the visionary agriculture and food system, which have several misconcepts and drag world agriculture in unaffordable, in appropriate direction creating wide gap between rich and poor and developed and developing countries of world, that will lead to still devastating situations. Here appraisal of smart, alive and enthusiastic (RACY) nature agriculture and accompanying innovations will give highly appropriate and suitable right direction for appropriate affordable agricultural system, generate benefits from right now onward, instead of waiting for almost three decades, and save world time, resources, energy and environment. This will become world saviour for Agriculture and Food system by bringing in right direction, which will be affordable by developed and developing countries of the world and save researches' endeavours going to waste and enable them bring quick beneficial research support to the appropriate Agriculture and Food Systems and Environment. Objective of this research was to analyse the visionary agriculture and food system vis a vis already existing incredible innovation viz RACY nature agriculture [1] and accompanying supporting innovations justifying supremacy of the existing system and appraisal of the world agriculture.

The manuscript comprises description details of the visionary agriculture to 2050 in contrast to Racy nature agriculture, in terms of different evaluation indices prevalent in agriculture. Research results substantiating the claims are also presented, which will be sufficiently justifying adoption vis a vis discard the endeavours for adoption of inappropriate path for agriculture in present and posterity.

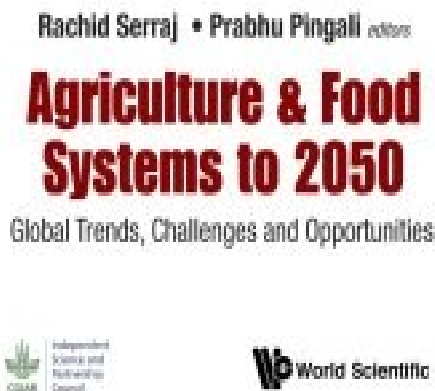
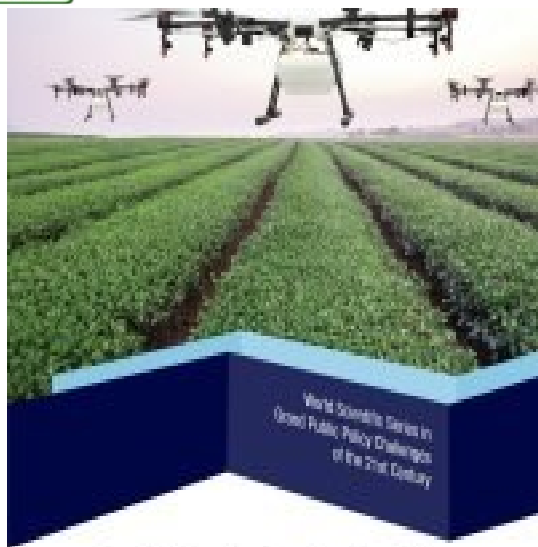


Fig. 1. Scenario of Agri- Food vision 2050 [2].

II. MATERIALS AND METHOD

2.1 Dynamics of Global Population

Dynamics of population (prepared using data of Thompson and Baver, 1965 [3] at decades interval reveals that fast increase in population started in decades of 1930, that became base for increased projected population that would be reaching over 9 billion global population by year 2050. The period also corresponds to accumulation of carbon dioxide in atmosphere that produced noticeable global warming. These days the climate change has created adverse extremities of hydrologic condition viz unprecedented floods in deserts.

The period after decades of 1930, with enhanced demand for food had triggered excessive soil loss by runoff leading to wash off and gully erosion, leading to loss in productivity and loss of land becoming out from the production system. These developing situations have created likely enhanced demand under limiting land water condition. Hence, it demanded innovative and productive agriculture and food systems. Research scientists have endeavoured and been developing agriculture and food production systems. In this strive RACY nature agriculture [1] developed in 2013 and since then many innovations brought in Agriculture and Food systems. A new Scenario [2] has been attempted and launched in 2018 (Fig 1).

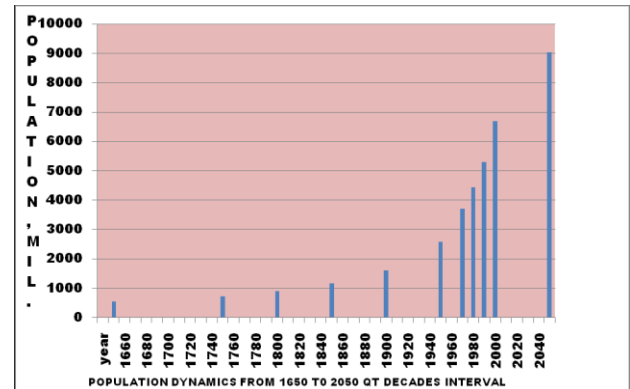


Fig. 2. Long term dynamics of increased population, data from reference [3].

2.2. The Features of the Visionary Agriculture Food 2050 [2]

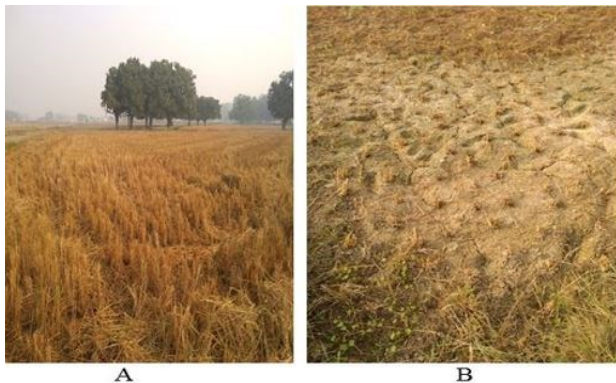
Feature of visionary Agri-Food system [2] is described as what it has been displayed in Fig 1. The visionary feature can be classified one that is visible on ground and other that is above the ground. The ground condition reveals very vast field which may be true for some countries, but in general field sizes are getting reduced generation after generation, in many populous countries. The important aspect is the crop stand is uniform. The crop is well fertilized to maintain deep green color so that it maintains photosynthesis to function at its maximum pace. What will be vision of land and water is not becoming clear as yet, as per the photograph.

The aerial view indicates some agricultural operations are carried out by employing drone, which is not affordable under many situations. The aerial spray is deemed to be operated for weed control and plant protection measures, which make it clear that use of weedicides and insecticides, will prevail in the visionary agriculture Agri-Food 2050. The exhaustive use of weedicides and insecticides have already polluted environment and caused threat to human health, making environment uninhabitable. This technological innovation is lacking in real scientific innovations which are able to tackle the weed management and weedicide with complete elimination of weedicides and insecticides from the scene. In addition the new scientific breakthrough bring unimaginable increase in yield with nonmonetary input practices right from the ground, without causing such undesirable devastating false supremacy, being claimed by the visionary Agri-Food 2050.

One thing is also apparent that with the visionary Agri-Food 2050, [2] the crops will have to be harvested by non affordable harvester combines developed in western countries. Such harvesting have already made Delhi and National capital region (NCR) to severely suffer from air pollution as caused by the stubble burning in surrounding states of Punjab, Haryana, Uttar Pradesh and Rajasthan. As an example, a scene of field harvested by the harvester **Fig 3** depicts scenario which brings a new problem of stubble burning **Fig 4** and air pollution. The large volume of stubble on the ground will impose risks of bushfire, as has been happening in most of developing South East Asian countries where such harvesting machine has been used.

The air pollution will spread in the world atmosphere, as it is not restrained by any boundary and entire environment will get polluted by smoke pollutions.

The photographs amply reveal the likely scenario in the visionary system Agri Food 2050 and entire world will have no fresh air to breath for survival. Thus it is clear that the visionary Agri-Food 2050 will bring certain to happen devastation even before reaching its targeted development dates 2050.



A-Combine harvester-paddy Stubble in field. B-Indigenous harvested clean field indigenous mechanization.
 Fig. 3. Paddy field harvested by harvester combine and indigenous harvesting.



A. Stubble burning B Pile paddy straw Burning
 Fig. 4. Burning of paddy stubble.

Entire South East Asia has been cultivating paddy, practicing biomass burning and suffer air pollution [4], [5], [6] Bad environmental in sky above paddy cultivating countries will prevail and spread in entire world sky that will be disaster.

Further, fermentation and decomposition of paddy stubble under anaerobic condition will trigger inducement of hydrogen sulphide (H₂S) [7] that will bring encephalitis as has been happening in Gorakhpur Tarai region. Thus, the vision Agri-Food 2050 will be again disastrous; implicating that vision Agri-Food 2050 will bring disaster on the world scale.

2.3 Features of Existing Incredible RACY Nature Agriculture

The existing smart, alive and enthusiastic (RACY) nature agriculture was developed in year 2013 [1]. The nature agriculture employs scientific principles of plant science, soil science, agricultural chemistry physics, hydrology, engineering, environmental sciences and environmental engineering. In the practice earlier researches had been investigated and appropriate lessons learned were optimized to constitute various factors as they occur in agriculture viz the crops, cropping pattern, manures and fertilizers, stand establishment, sowing, irrigation, weed management, harvesting and post harvest cultivations. Since in its development several innovations have been brought in all aspects of agricultural operations, making it the most befitting nature based agriculture. It follow path of quantum mechanics ie there is no deviation and a fixed mode technology is applicable for all crops, cropping practices under irrigated and rainfed agro-ecosystem [8]. Since 2013 several progressive unique innovations in almost all aspects of agriculture have been brought in the nature agriculture [9]-[15]. Table 1 presents exhaustive list of innovations, the relevant nature cycle, scientific basis, justification and likely enhancement in yields due to the components operations and resulting status in support of nature agriculture. At present the agriculture system accommodates 15 factors, which constitute sustainable agriculture overcoming adverse affects of climate change, scarcity of water, pollution of soil, water and environment.

Table 1. Sequential quantum mechanics based operations in nature agriculture.

S. No	Operation	Nature cycle	Scientific basis	Justification	Yield contribution, %	Justification
1	Manure	-	-	Organic nutrient supplement	10	Sulphate providing
2	Fertilizers	N	Plant nutrients	Yield increase	40	RDF+
3	P Solubilization	P	Plant nutrient	yield increase	20	Nutrient invent
4	Tillage and trash management	Gray chemistry	Gray chemistry	Good field condition for crop	10	S cycle management
5	Eco nursing	N	Creating favourable eco and resilience to climate change	It smoothers hostile condition of early and late onset of right sowing time	5	Fosters compensating crop growths and ensures successful crop
6	De activation of heavy metals and toxic gases	Adsorption and absorption	Deactivation by activated charcoal.	Good food commodity	5	Elimination of problem, Good quality
7	Bed formation	Plant supporting	Hydrologic resilient sustainable bed form	Successful crop making secondary natural resources in the nature	8	Assured crop yield

				agriculture.		
8	Eco –zero weeding	Nitrogen cycle	N fixation to overcome to makeup yield loss if any	Enhanced yield	40	N fixation and successive use
9	Sowing	Plant science	Plant science	Uniform and robust crop stand establishment	40	Lateral growth by uniform stand
10	Super micro irrigation	Nature based micro irrigation	Endowment of green chemistry in the system	Exemplary yield and saving of water	20	Enhanced productivity by N, P, S effects
11	Ward and watch	Integrated crop protection	Integrated	General farm management	5	No crop loss
12	Harvest	Selective harvest	Crop management	Good harvest	8	Minimum harvest loss
13	Crop processing	Threshing	Save from risk of crop damage	Good harvest	7	Elimination of harvest loss
14	Post harvest cultivation	Building nutrient in soil	N cycle management	Field with nutrient rich condition	15	Improved residual and post harvest N management.
	Arithmetic				243	(3.43 + 8.73)/2 = 6.08
	Multiplicative				8.73	
	Adopted*				6	

*The mean of two differently arrived increases in crop yield is adopted to signify improvement. Further, research will be able to determine exact values of crop yields, which will add impetus of the RACY nature agriculture. [1]

III. RESULTS

Since wheat and rice have been proven after lot of research and developments by national and international organizations and their productivity enhancement have shown lot of hopes, this cropping system was adopted for further fortifying justifications. It needed still stronger technological breakthrough than that have been in the past to fulfill the present and future needs. This study is presenting such envisioned breakthroughs that would work not merely as a bright spot, as it happened in past years [16] but enlighten as a sun technology for entire global agriculture [8].

3.1 Contrast of Visionary Agri-food 2050 Versus RACY Nature Agriculture

Based on features visible in scenario Agri- Food 2050 (Fig 1) and existing status of Racy nature agriculture a

table of comparison is drawn for comparing the research innovation, likely gain/ loss and resulting scenario by 2050 (Table 2). While RACY nature agriculture has created feasible and incredible innovations, proven its validity, the Agri-Food 2050 is displaying aerial scene of drone/ allied applications. While such technology may find place for application under inaccessible sites, but agriculture involves peoples action and socio economic public governance, it cannot be same as envisioned. The world scenario is depicted in item 16, the RACY nature is established Agri-Food system will be progressing on ground with people's need and situations, the visionary Agri-Food 2050 is false devastating glimpse that will create devastation in environment, economy and agriculture world over.

Table 2. Contrast of features between Agri Food 2050 [2] new and existing RACY nature agriculture [1] in scientific gauge scale of agriculture science.

S. No	Nature cycle	Operation	Agri-Food 2050-	RACY nature Existing	Net effect of Existing RACY nature	Net effect on visionary Agri- Food
1	Crops and cropping pattern	N Cycle, Eco-hydrology	Need Res.	Established	Successful agric with enhanced yield	Devastating situation of Agt-Food
2	Manure	Green Chemistry	Not clear	Established	Successful agric with enhanced yield	Not known
3	Fertilizers	RDF	May be over dose	New innovation	Successful agri with enhanced yield	Uncertain
4	P Solubilization	RDF	No innovation assumed	New innovation	Successful agri with enhanced yield	Excessive dumping
5	Tillage and trash management	Raised bed and Furrow	Not clear, need res	New tech patentable developed	Successful agric with enhanced yield	Excessive mechanical operation
6	Eco nursing	Ecosystem	No vision	New innovation	Successful agri with enhanced yield	No vision

7	Deactivation of heavy metals and toxic gases	Bioschar	No vision	New innovation	Successful agri with enhanced yield	No vision
8	Bed formation	Foreseen Till machine	No vision	Established	Successful agric with enhanced yield	No vision
9	Eco –zero weeding	Eco Sci	Weedicide	New innovation	Successful agri with enhanced yield	Chemical weedicide
10	Sowing	Plant sci	Machine	New Incredible innovation	Successful agri with enhanced yield	Not clear
11	Super micro irrigation	New Watermanagement	No vision	New innovation	Successful agri with enhanced yield	No vision
12	Ward and watch	Bird scare crow	No problem foreseen	Established	Successful agri with enhanced yield	No problem foreseen
13	Harvest	Selective	Combine harvester	Selective harvesting	Successful agric with enhanced yield	Devastating situation as of existing air pollution
14	Crop processing	Pyramid powered shed for drying	Combine –leave residue	Threshers and New Winnowing	Successful agri with enhanced yield	Combine
15	Post harvest cultivation	N cycle-eco nursing	No vision	New innovation	Successful agri with enhanced yield	No vision
16	Agri-Food	Situation of future scenario	-	-	Very Prospecting present and ever to continue	No certainty and future devastations

3.2 Crop Stand Establishments

Optimum and uniform stand establishment of crop sown in field is the first and foremost requirement for present and future for which agronomists, agricultural machine designers and soil scientists have been endeavoring. In the RACY nature [1] a very logical scientific approach based technology was developed which produced exemplary crop stand. The wheat crop sown at normal seed rate after harvest of paddy on large size farmer’s field is shown in Fig 5. The scenario in the RACY nature agriculture is in no way inferior to what has been depicted in envisioned Agri-Food 2050. The innovative practice is so simple, feasible and involving no monetary input, not requiring any special machine, produces unimaginable exemplary crop stand establishments. Such crop stands (Fig 4) sufficiently justify superiority of RACY nature agriculture over that has been displaced vide Fig 1 in Agri-Food 2050 [2].



Fig. 5a. Wheat crop stand after first irrigation in RACY nature agriculture practice in the farmer’s field after harvest of paddy Year 2018.



Fig. 5b. Wheat crop stand after first irrigation in RACY nature agriculture practice in farmer’s field after harvest of paddy Year 2019 (Crop growth after 1st irrigation).

3.3 Enhancement in Yield Due to Eco Zero Weeding

An incredible innovation of eco-zero weeding agriculture developed as non-monetary scientific technology produced an unimaginable yield of garlic and onion (Fig 6) weed management the scientific innovation facilitates weed management with non monetary input, in addition it enhances unimaginable yield of crops. Such scientific development under the robotic and drone operated chemical weedicide has not come to even in dreams of the technologists. This scientific innovation has never come to the ongoing claimed technological breakthroughs proven by study [10]. This fact also sufficiently established supremacy of RACY nature agriculture over visionary Agri -Food 2050.

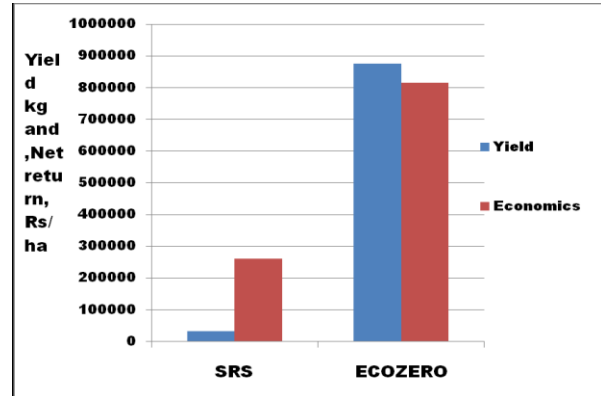


Fig. 6. Unimaginable enhancement in yield of garlic and onion.

Table 3. Wheat varieties and their yield potential in year 2016-17 in which the present study was conducted.

S. No	Variety	Location	Site condition	Potential/ Harvested yield	Site condition
Bread wheat variety					
1	DBW168	ICARWBRI	PZ-Highly potential are	70.1	RSF*
2	DBW173	ICARWBRI	PZHighly potential are	57.0	RSF
3	Pusa wheat 1612(HI1612)	ICAR, IARI RS Indore	NEPZ	50.5	RSF
DURUM Varieties					
4	Sabour Nirjal (BRW3723)	BAU Sabour	Rainfed Timely sown	47.3	RSF
5	HW5207(CoW3)	IARI, RS Willington	TamilNadu	59.6	RSF
6	GUj Junagadh Weat	JAU, Junagadh	Gujarat	78.3/67.5	RSF
7	UAS334	Karnataka	Irrigation and timely sown	59.5	RSF
8	PBW343	Commercial variety for wheat	Moderate Potential Zone	108	Farmers' fields possible.
9	PBW##	Commercial variety for wheat	Moderate Potential Zone	130	Farmers' fields possible.

*RSF- Research farm.

3.4 Enhancement in Yield of Wheat

Researchers have been displaying their levels of wheat productivity, which make several claims. In the same domain a nature based production technology has been developed which is equally effective in enhancing yield of wheat. The nature based agriculture named as smart, alive and enthusiastic nature agriculture developed in 2013 has shown several success stories of enhancement in yield of crops of rainy and winter seasons. The nature technology has been supplemented with several innovations; almost all related agronomical operations, in crop production.

A study on farmer's field was conducted in technology ignorant village at *Dhobahan*, Allahabad, Uttar Pradesh, India in large size plot after harvest of paddy. The wheat variety PB 342 was sown late on Dec 20, 2017. The

innovative technology was applied to the crop establishment hand broad casting sowing and seed covering, treatment of dynamic phosphorus (P) solubilizing and some N fixation, and application of super micro irrigation, eco-zero weeding etc. Besides these operations no extra supplement to the crops was applied. The photo graphs at various crop growth stages and at nearing the harvesting were snapped as evidentiary substantiation. The total yield and sample yield harvest were recorded. The yields were unimaginably high (>.100q/ha) and created new level in wheat productivity contrasted with most promising yields of wheat varieties sorted out in Annual Report 2017-18 of ICAR-Wheat and Barley Research Institute, Karnal, Hayana, India.

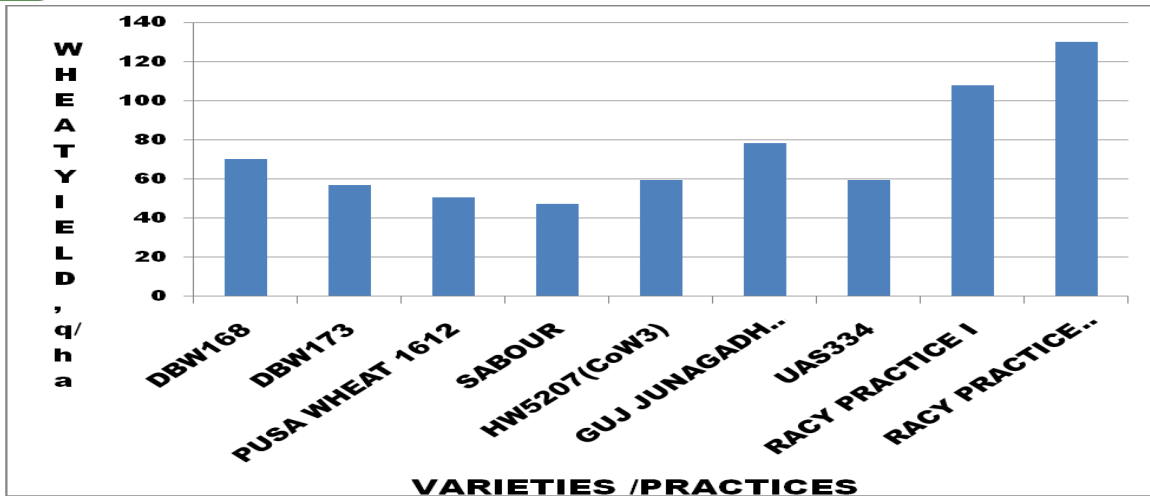


Fig. 7. Wheat varieties/Practices versus yield, q/ha, (Contrasting data source: Annual Report ICAR-IIWBR, Karnal, 2017-2018) [17].



Fig. 8. Photograph of field crop at maturity.

Based on the evidentiary substantiation it is concluded that innovative quantum (fixed mode) mechanics based production technology will perform still better than the results presented in this study. The yield performance of the technology will be more successful that will build confidence in wheat cultivation in India and rest part of world agriculture. Thus, it will produce food for present and posterity when land resources become scarce with multiplicity of land diversifications and development of adversity of climate change.

3.5 Eco Resilience to Smoother Aberrations

Racy nature agriculture infuses visible degree of resilience in crop growth factors which bring improvement in yields. Study conducted towards assessment in makeup of grain filling, standard deviation and coefficient of variation revealed by Fig 9. The wheat crop sown after a month delay produced grain filling almost equal to normal date sown crop, reduced standard deviation and coefficient of variations in grain filling in ear heads of crop in fields. Thus, it is visible that the RACY nature agriculture will enable cope up with the climate change and any operational delay in crop cultivation. Thus, it has all desirable features of resilient agriculture, which has been all time endeavored in world agriculture.

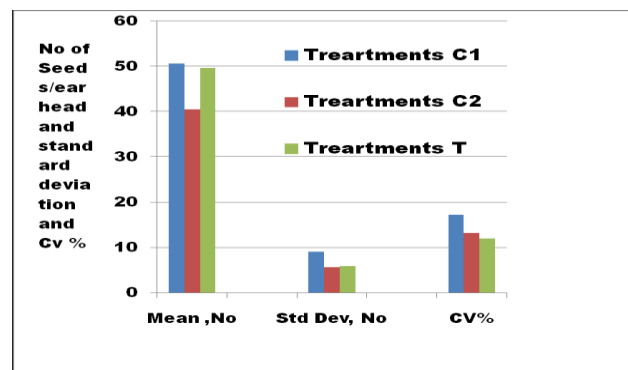


Fig. 9. Resilience based makeup in crop growth factor viz grain filling per ear head of wheat sown at different dates established under RACY nature agriculture (C1- 20 Nov, C2- 13 Dec C-3 20 December, 2017).

3.6 Enhancement in Water use Efficiency by Super Micro Irrigation

In the racy nature agriculture the enhancement in yield are tremendously high with same level of application of irrigation water. Enhanced yield gave very high water use efficiency of garlic and wheat crop displayed in Table 4. A general contentious appeared that almost over four fold

enhancement in water use efficiency of irrigation can be acquired by super micro irrigation. Thus, lot of water scarcity can be coped up with RACY nature Agriculture and sustainable food production acquired.

Table 4. Water productivity scenario appraisal of garlic and wheat.

S.No	Treatment	Yield, q/ha	Water used mm	Water use efficiency, kg/mm/ha	Remark
Garlic					
1	FMW (Control)	35.5	480	7.4	Water use assessment was base on no of irrigation during winter season
2	NW	55.5	480	11.6	
3	EZWAE	114	480	23.8	
4	EZWAEP	125	480	26.0	
5	EZWAEPs (1.1)	137.5	480	28.6	
Wheat					
6	Control	33	300	11	Yield increase is tremendous.
7	ZWAPPs	97	210	46.19	
8	ZWAPPs 2.5/3. 873	97	210	46.19	

3.7 Protection of Environment from Air Pollution

The RACY nature agriculture involves practices which operate on green chemistry ie no emission of green house gases. The innovation of cultivation practice, sowing, weed management, super micro irrigation, selective harvesting, crop processing and post sowing agricultural operations eliminate carbon foot prints in agriculture. It eliminates paddy stubble burning, hence eliminates air pollution, thus creates livable environment.

3.8 Supplementing World Agriculture with New Intellectual Property

The RACY nature agriculture has already created incredible innovations (**Table 1**), thus provided intellectual property for world over agriculture. Such intellectual property is not likely to happen with style of Agri-Food 2050 system - **Fig 1**, which is bound to create wide gap between developed and developing countries of the world. Since agriculture and environment supplement basic need of people, one has to think of situation at large global scale. The visionary Agri- Food 2050 is inclined to create pseudo supremacy and not real scientific advancement in agriculture.

3.9 Creating World Agriculture Tending towards Skewing Organic Agriculture

People in general are inclined to prefer organic food for their wellness. It is a subject of debate on what and where is benefit of organic food in feel good and wellness. Keeping aside this debate for the present, it is brought to general consensus that for increasing global population agriculture should focus producing good carbohydrate, proteins, vitamins and spices which help maintain feel good and wellness. The Racy nature agriculture has all good aspects required for enhancing unimaginable yield of carbohydrate viz wheat and rice, maize and pulses. It is established that entire pulse production can be brought by organic farming. The supplementation of one fourth of recommended dose of fertilizers viz N, P, K by organic manure enhances maximum yield of crops. Endowment of

C, N, P and S cycles in the RACY nature agriculture brings tremendous backing of organic agriculture. The incredible innovations in the RACY nature agriculture make world agriculture tend inclined towards organic farming. This enables creating new wave of improved agriculture for high sustainable productivity and clean air and environment, cordial and harmonious society and desirable socio political governance.

IV. DISCUSSION

4.1 General Scenario

This study presents its innovative development being carried out as smart alive, enthusiastic (RACY) nature agriculture and contrasted with new Agri –Food vision to 2050 based on visible features and likely ground realities. Most visible feature of the Agri -Food 2050 is likely to come as application of mechanical and solar powered gadgets and scientific tools where as the RACY nature agriculture has been developed on science based innovations. The gadget based new technology has no appraisal of land condition and sizes of fields which are getting reduced generation after generation. Hence, the Agri-Food situation is not likely to help the most of developing as well as developed countries with large population dependant on agriculture. There can be no resource to import food, hence the scarcity of food is likely to create unrest in public, as has been seen in many countries in gulf, the socio economic and socio political scenario had changed and created a different situation.

On the farmers' fields the crop growing conditions are restrained by several deterrent factors viz grazing by antelopes, spoilage by wild boars and many uncontrollable disturbances as (Fig 10). In spite of unavoidable situations the RACY nature agriculture has shown unimaginable increase in yield of wheat on farmers' open field condition. This yield has surpassed country wide yields harvested under well protected condition of Research Farms. This technology showed overwhelming prospect of Agri -Food.



A-Harsh and low fertility soil.



B-Blue bull grazing.



C- Initial crop stand.

Fig. 10. Initial stage of wheat sown after paddy is subjected to variety of deterrent factors.

4.2 Vision and Mission Prosperity

The vision as visible from the **Fig 1** is clear that lot of advancement in space, robotics, IT and solar power etc will come in visionary Agri-Food to 2050. The **Fig 2** presents the population change, when land resources are limited and their multifarious diversions are likely to increase, unless there is tremendous increase in production, there will be unbalanced development.

There has been lack of mission for producing required commodity based production, which cannot come unless there is adequate scientific development. Although it is not yet clear from the **Fig1** of Agri- Food to 2050, it is sufficiently advanced and has been depicted in RACY nature agriculture. The productivity enhancement has potential with EACY nature agriculture of bringing more than six fold enhancement in yield of crops (Table 1). The foremost lucrative feature is that most of science based developments of RACY nature agriculture are non

excessive budget demanding, hence it will foster mission based production. There can be any mission where the RACY nature agriculture will support all the situations as sun technology to be true for all the times and everywhere.

4.3 New dangerous situation of Residue management

The most advanced technology known and brought in practice on the ground has been the combine harvester and level of residue left in field **Fig 3** and after peoples' action for disposal by stubble burning **Fig 4**, which have proven devastating for air pollution and environment. This situation has been unsurmountable for Delhi and NCR. One can imagine what will happen to air and environment when it comes to global scenario. The air pollution is not having any restricted boundary that means a disastrous situation is likely to occur. So far, there has been no simple technological development to overcome the problem of biomass burning causing smoke based air pollution. This researcher has developed science based technology viz RACY nature agriculture. This situation creates one to think and make assessment by pros and cons contrast of Visionary 2050 and RACY nature agriculture which is endowed with scientific advancement revealed vide **Table 1** and **Table 2**.

4.4 Health and Wellness

Health and wellness is always coming fast in developing agriculture. Racy nature agriculture is highly conscious of good environment hence both such difficult situation will occur. This will lead to a balanced development for all countries of the world. The Visionary Agri-Food to 2050 will lead to disastrous situation as reveled in the Delhi NCR air pollution due to residue burning. An expected situation will turn in to unforeseen bad scenario.

4.5 Social Harmony and New Difficult Situation

In spite of any technological development food situation is controller of stability in market of essential commodities. Once food sufficiency and wellness acquired and sufficiency is established other needs will get tolerated or deferred and harmony maintained. In the visionary Agri – Food to 2050 will create lot of misbalances in world scenario and unrest in global situation. There is already scarcity of water, but visionary depiction in **Fig 1** in no way is sowing any good prospect of how the scarcity of water will get overcome? On the other hand RACY nature agriculture has invented nature based super micro irrigation which has capability of enhancing water use efficiency by almost four fold. Thus, RACY nature is front running technological development and will always stand superior to the visionary Agri-Food 2050.

4.6 Climate Change and Seasonal Aberrations

Global warming has emerged and its visible effects are realized in climate change, which causes several aberrations established by **Fig 9**. The RACY nature agriculture is Green Chemistry prudent development [15]; hence it suppresses the bad effects and copes up with bad situation. This situation is not clear in the visionary Agri-Food 2050. The methane and nitrous oxides are pre cursor for building hazardous ozone (O₃) gas [18], which causes health hazard. The RACY nature agriculture has innovative methods for control and eradication of carbon dioxide, methane and nitrous oxides [7], [9] - [15]. The

visionary Agri-Food - 2050 reveals no sign of such development in agriculture.

4.7 New wheel Invented with Fortified Spokes to keep system Strong, Long Lasting and Sustainable

If and when it comes to realization and believe that the vision Agri-Food 2050 as the most likely advancement to come by 2050, the RACY nature agriculture [1] is the most scientific advancement as invention of wheel and with fortified spokes of the invented wheel, both will go logway and remain operating forever (Fig 11) [19], [20], [21], [22], [23]. The socio economic status of developed countries can turn to appreciate and afford to buy the expensive gadgets for agriculture at the cost of many national developmental priorities, but failure in achieving real scientific advancements will lead to resentments of disparities of advancements within different countries.

Contrary to this, the RACY nature agriculture, with minimal expenditure will lend adoptability of scientific advancement and make huge benefits [24]. The gain will convert scenario with scientific advancement adopting countries reverse ie from bottom to top, ie better agriculture scenario with developing countries than that will appear with developed countries. This will be scenario of world agriculture in time to come. This likely trend needs considered opinion in favour of adoption of RACY nature agriculture. As it is forecasted that India will be the most populous country for which RACY nature is very perfect agriculture system which is ready for adoption right from present, instead of losing time in waiting for what is visionary Agri-Food Agri 2050 (Fig 1).



Fig.11. RACY nature agriculture[1] as invented wheel to run on the ground in contrast to visionary Agri-Food 2050 that flies high, not affordable for developing countries with small holding and learning agriculture scientific technology.

V. CONCLUSIONS

Agri- Food to 2050 has been flashed to come up in 2050. The present study makes contrast with Agri-Food 2050 and already existing RACY nature agriculture with incredible innovations. There is contrasting better feature in already existing RACY nature agriculture than that would be coming in the visionary Agri-Food 2050. There do occur many disastrous situations particularly when it comes to the ground realities of limiting land situation, weedicide polluting action on land, water and environment and harvest as well as residue management. There have

been bad situations of air pollution due to residue burning, in the event when it is easiest way of disposal that causes disastrous air pollutions. Science based innovations are available in RACY nature agriculture, which will enable world make balanced and inexpensive advancements to bring social harmony as food need is easily fulfilled by the RACY nature agriculture. This study indicates several alarming cautions and recommended adoption of RACY nature agriculture.

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AUTHOR'S PROFILE



Dr. R.C. Yadav

Ram Charan Yadav was born in Tehsil Gyanpur in the then district Varanasi, now Sant Ravidas Nagar (Bhadohi), Uttar Pradesh on 15 Sept, 1944. He completed primary Secondary and Intermediate education in Schools and Colleges available in the area. He completed B.Sc. Agri Engg and Tech from the then UPAU, Pantnagar in 1968 and M. Tech in Soil and Water Conservation Engineering from IIT, *Khaaragpur* in 1970. After working for 22 year he again started Ph.D. studies and completed his Ph.D. in Water Resources, Civil Engg. from IIT, *Mumbai* in July 1997. He joined first service as Jr. Research Engineer at Experimental Research Station, University of Udaipur in 1971, then as Assistant Professor in College of Engg. in the same University and then joined at Central Arid Zone Research Institute Jodhpur in May 1972. He worked as Engineer de Etta in Ministry of Hydraulics, Land Improvement and Environment, Government of Algeria on Foreign Assignment for two years from Nov 1977, then Joined as Lecturer in Ahmadu Bello University, Kaduna State, Northern Nigeria. He again returned to ICAR in 1985 and continued as Senior Scientist CSWCRTI, Research Centre, Agra. He became Principal Scientist in 1998 and then as Head of the Research Centre Agra from Nov 2001-Sept 2006. He worked for short term assignments in ASRB post retirement. He took assignments as Professor in UPTech University colleges in 2008 and Foreign Universities in Eritrea in May 2009 - Sept 2011 and worked in Ehiopian Universities from Nov 2011 till July 2014. Dr. Yadav brought several refinements in use of conservation structure and watershed management and associated technologies during his service in ICAR and he pursued his researches and created several innovative researches *viz* smart, alive and enthusiastic (RACY) nature agriculture. He created innovations on nitrogen cycle management and developed innovative crops and cropping practice, practice of nutrient, weed management under nomenclature of zero weeding agriculture, Super-micro irrigation as superior replacement of drip irrigation and biotechnology of crop stand establishment for crop production. He received UNESO grant for his B. Tech student Project in Ahamadu Bello University in Nigeria, ICAR *Pandit Jawahar Lal Nehru* Award in 1999 for Outstanding PhD Thesis work at IIT, Bombay. He received Engineering Research Fund Award for social welfare research and Thomas Edition Award 2012. Professor *Yadav* was awarded World Academic Championship in Chemical Research 2017, World Academic