01	**TITLE**	**EFFECT OF CHITOSAN COATING ON QUALITY RETENTION OF COLD STORED STRAWBERRIES**
	Objective	To evaluate the effect of chitosan coating on shelf life extension, moisture loss and fungal decay on cold stored strawberries.
	Importance	Fresh berries are an excellent source of vitamin-C (100g provide 58.8mg or about 98% of RDI), which is also a powerful natural antioxidant. The fruit is rich in B-complex group of vitamins. Due to increase in strawberry demand and export worldwide, practical methods of packaging and coating are necessary to improve post harvest quality of strawberry.
	Research Workers	Irrum Babu Abdul Rahim Khan Liaqat Ali
	Project Duration	2014 – 2017
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 0.5% chitosan coating T_2 1% chitosan coating T_3 1.5% chitosan coating T_4 2% chitosan coating
	Layout Design	CRD Factorial No. of Replications = 3 No. of treatments = 4
	Plan of Work	Fruit of strawberry (chandelier) will be harvested from orchard of Horticultural Research Institute, AARI. Strawberries of uniform size, shape, color and free of mechanical damage or fungal decay will be selected and washed with 200ppm TBZ solution prior to coating. After washing fruits will be dipped into different concentration of chitosan solutions as mentioned above for 15 seconds and dried at $20\pm2\ ^0C$ for 1 hour, then packed in perforated PET boxes. Boxes will be kept at 4^0C and 80% RH up to maximum acceptable period. Data will be recorded for weight loss, TSS, Acidity, pH, Firmness and Color after 3 days interval.
	Previous Year's Results	New experiment
02	**TITLE**	**SHELF LIFE EXTENION OF PEA PODS BY THE APPLICATION OF SPROUT SUPPRESSENT**
	Objectives	To control pea pods sprouting during low temperature storage.
	Importance	During the storage of pea pods at low temperature sprouting problems occur. Loss of green color, pitting, splitting and chilling injury are the major post harvest problems due to which cooking quality greatly effects.
	Research Workers	Abdul Rahim Khan Farah Shamim Irrum Babu
	Project Duration	2014 – 2017
	Location	Post Harvest Research Centre, AARI, Faisalabad

	Treatments	T_0 Control T_1 Packing in polyethylene bag (22 gauge) T_2 Potassium permanganate (1.5g)+ Packing in polyethylene bag (22 gauge) T_3 Mint oil (1%) + Packing in polyethylene bag (22 gauge)
	Layout Design	CRD (factorial) No. of Replications = 3 No. of treatments = 4
	Plan of Work	Pea pods (available variety) will be harvested from the Vegetable Research Institute, AARI at mature green stage. After manual grading and sorting, peas will be washed with potassium sorbate (1500ppm). Then above mentioned treatments will be applied, stored at 0±2^{o}C with 80-85% RH for further studies. Data regarding weight loss %, firmness, sprouting % and color of pea pods will be determined after three days interval.
	Previous Year's Results	New Experiment
03	**TITLE**	**EFFECT OF 1-MCP ON POST HARVEST QUALITY OF BITTER GOURD *(Momordica charantia)***
	Objectives	To explore the effects of 1-MCP on delaying ripening of Bitter gourd. To examine the physicochemical behavior of Bitter gourd stored at low temperature
	Importance	Bitter gourd or Bitter melon is an important summer vegetable of Indo Pak. It is famous for medicinal properties. Loss of green color, pitting, splitting and chilling injury are the major post harvest problems.
	Research Workers	Farah Shamim M. Asghar Zareena Yasmin
	Project Duration	2014 – 2017
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 10ppm T_2 20ppm T_3 30ppm
	Layout Design	CRD (factorial) No. of Replications = 3 No. of treatments = 4
	Plan of Work	Bitter gourd (Faisalabad long) will be harvested from the field of Vegetable Research Institute, AARI at immature stage. After manual grading and sorting, fruit will be cleaned with muslin cloth. Above mentioned treatments will be applied for 24 hours at 25^{O}C, then packing will be done in perforated plastic bags (22 perforations) and stored at 15^{o}C with 80-85% RH for further studies. Data regarding weight loss %, firmness, fiber, TSS, decay % and color will be determined after two days interval.
	Previous Year's Results	New Experiment
04	**TITLE**	**DEVELOPMENT OF RIPENING PROTOCOL FOR BANANA FRUIT (*Musa acuminate L*)**

	Objectives	To develop a complete protocol to extend the shelf life of banana fruit. To control the crown browning and peel blackening in banana fruit.
	Importance	Banana is one of the most appreciated fruit all over the world because of its multipurpose use as food. Lack of suitable post-harvest management practices may lead to huge economic loss for the banana producing area. An integrated approach can ensure product safety and quality.
	Research Workers	Zarina Yasmin M. Asghar Irrum Babu
	Project Duration	2014 – 2017
	Location	Post-Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 HWT (50^{o}C for 15 minutes) T_2 TBZ (1500 ppm) T_3 HWT (50^{o}C for 10 minutes)+ TBZ(1200 ppm) T_4 Potassium Sorbate (1500 ppm) T_5 HWT (50^{o}C for 10 minutes)+ potassium sorbate (1200 ppm)
	Layout Design	CRD (factorial) No. of Replications = 3 No. of treatments = 6
	Plan of Work	Fully matured green Banana of available variety will be procured from the market. After harvesting the fruit hands will be cut from the bunches and dipped into water along with potassium aluminum sulphate (1.5 %) to control latex problem. Fruit will be subjected to above mentioned treatments and packed in polyethylene bags (22 gauge). The fruit will be divided into two lots after air drying. One lot will be exposed to ethylene gas (400 ppm) at 25^{o}C for 24 hours before the storage and then stored at 14^{o}C with 90-95% RH for further studies. After two weeks of storage period the second lot of fruit will be exposed to ethylene gas (400ppm) at 25^{o}C for 24 hours. Data regarding weight loss %, firmness, pH, TSS and color will be determined after two days interval.
	Previous Year's Results	New Experiment
05	**TITLE**	**EFFECT OF ETHYLENE ANTAGONISTIC CALCIUM SALTS ON CONSERVATION OF GUAVA FRUIT(*Psidium guajava*)**
	Objectives	To delay the onset of ripening and senescence process and evaluate the effect of post-harvest application of calcium salts on the post-harvest life of guava fruit.
	Importance	Guava is a highly perishable fruit that shows intense metabolic activity. Guava fruit becomes fully ripe between 3-5 days at room temperature. Due to such perishability, the control of fruit ripening is fundamental for increasing shelf life after harvest. The main factors depreciating postharvest quality in guava are fast loss of green color, excessive softening, high rot incidence and loss of turgidity. The recent finding that calcium salts interferes with ethylene link to its binding site represents a new and powerful tool for postharvest management of climacteric fruits.

	Research Workers	Zarina Yasmin M Asghar Farah Shamim
	Project Duration	2014 – 2017
	Location	Post-Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 $Ca(NO_3)_2$ 1% T_2 $CaCl_2$ 1% T_3 $CaSO_4$ 1%
	Layout Design	CRD (factorial) No. of Replications = 3 No. of treatments = 4
	Plan of Work	Guava fruit of gola/sofaida variety will be harvested at light green mature stage from the selected trees of Horticultural Research Institute, AARI in collaboration with Entomological Research Center, AARI for pre-harvest fruit fly infestation. After sorting and grading the fruit will be washed with TBZ 100ppm and dipped into Hot water at 46°C for 35 min. Then fruit will be subjected to treatments mentioned above, air dried and subsequently packed in newspaper. Both treated and untreated fruit samples will be placed at ambient temperature. Quality parameters like weight loss %, TSS Firmness, pulp acidity, vit C, reducing & non-reducing sugar and pH will be recorded after three days interval. Residual effects of pre/post-harvest sprays will be determined by the biochemistry section, AARI.
	Previous Year's Results	New Experiment
06	**TITLE**	**EVALUATION OF POST HARVEST STORAGE QUALITY OF IRRADIATED MOSAMBI (*Citrus sinesis*)**
	Objective	To control decay and maintain quality attributes of Mosambi for longer period of time.
	Importance	Gamma radiation has been used as a post-harvest food preservation process for many years. It is recently used as a possible alternative technology for citrus industry in order to fulfill the phyto sanitary trade laws.
	Research Workers	Farah Shamim Zarina Yasmin Malik Asghar
	Project Duration	2014 – 2017
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 Gamma radiation @ 0.5kGray T_2 Gamma radiation @ 1kGray T_3 Gamma radiation @ 1.5kGray
	Layout Design	CRD Factorial No. of Replications = 3 No. of treatments = 4

	Plan of Work	Citrus fruit (Mosambi variety) will be harvested from Horticultural Research Institute, AARI, Faisalabad. After manual grading, sorting and washing, fruits will be subjected to radiation treatments as mentioned above from PARAS foods (PVT) Lahore. Fruits will be stored at 5 ± 2^0C with 90-95 RH. Data will be recorded for TSS, Acidity, pH, Firmness, vit C and decay % after one week interval up to maximum acceptable period.
	Previous Year's Results	New Experiment
07	**TITLE**	**EFFECT OF ALOE VERA GEL ON QUALITY AND STORAGABILITY OF GRAPES UNDER LOW TEMPERATURE**
	Objectives	Use of natural edible coating to prolong the quality and shelf life of fresh produce.
	Importance	Aloe Vera gel is a healthy additive in fruits and vegetables. It is a polysaccharides, appears to act as natural barrier against transpiration. Gel contains various antibiotic and anti-fungal compounds that inhibit microorganisms responsible for food spoilage.
	Research Workers	Irrum Babu Farah Shamim M.Asghar
	Project Duration	2013 – 2016
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 Dipping in 1% Aleo Vera gel T_2 Dipping in 5% Aleo Vera gel T_3 Dipping in 10% Aleo Vera gel
	Layout Design	CRD (factorial) No. of Replications = 3 No. of treatments = 4
	Plan of Work	Grapes (gola) were procured from the market. After manual grading and sorting, fruit was washed with water. The water drops were removed, from the surface of fruit by fresh air blow. Matured leaves of Aloe Vera were collected and washed with 10% sodium hypochlorite solution. Aloe Vera matrix was separated from the outer cortex of leaves and this colorless hydro parenchyma was grind in a blender. The resulting mixture was filtered to remove fiber and pasteurized at 70^0C for 45 minutes and allowed to cool immediately to an ambient temperature. Ascorbic acid and citric acid was added to maintain its pH at 4. Viscosity of Aloe Vera was improved by using 1% commercial gelling agent. Gel was stored in brown amber bottle to prevent oxidation of gel. Nutritional analysis of gel was done. Fruits were dipped in different concentration of gel for 2-3 sec as mentioned above and stored at 1^0C with 85-90% RH for further studies. Data regarding weight loss %, firmness, pH, TSS, acidity and color was determined after three days interval.
	Previous Year's Results	Grapes dipped in 10 % Aloe vera gel showed firm texture and fresh color for a period of fifteen days. (T_3) Table -1

08 TITLE **PRE-STORAGE SALICYLIC ACID DIPPING OF TOMATOES TO ALLEVIATE POST HARVEST INTERNAL BREAKDOWN**

Objectives: Tomatoes have a short post harvest life due to rapid ripening and microbial decay. Salicylic acid (SA) is a natural phenolic acid. It has potential to maintain quality by suppressing enzyme activity.

Importance: SA and its derivatives are widely in use to enhance fruits postharvest life by controlling their firmness.

Research Workers: Zareena Yasmin
M. Azhar Ali
Farah Shamim

Project Duration: 2013 – 2016

Location: Post Harvest Research Centre, AARI, Faisalabad

Treatments:
T_0 Control
T_1 dipping in 0.5mM Salicylic acid solution for 5 minutes
T_2 dipping in 1 mM Salicylic acid solution for 5 minutes
T_3 dipping in 1.5mM Salicylic acid solution for 5 minutes
T_4 dipping in 2mM Salicylic acid solution for 5 minutes

Layout Design: CRD (Factorial)
No. of Replications = 3
No. of treatments = 5

Plan of Work: Tomatoes (hybrid) were harvested at breaker stage from the selected orchard. After sorting and grading fruit was washed. After this fruit was dipped in different solution of Salicylic acid as mentioned above and stored at 8-10^{0}C and RH 90 $\pm$ 5% for maximum acceptable period.
Data regarding TSS, Weight loss, % Acidity, Firmness and skin Color was recorded after four days interval. Ethylene and CO_2 concentration was also be recorded at the beginning and end of the project.

Previous Year's Results: Tomatoes dipped in 0.5mM Salicylic acid solution for 5 minutes predicted firm texture and color for a period of forty days. (T_1) Table-2

09 TITLE **SODIUM CARBONATE APPLICATION ALONG WITH CURING ON LEMON AGAINST GREEN AND BLUE MOLDS**

Objectives: To retain Lemon quality during storage at low temperature.
To control post-harvest fungal decay.

Importance: Sodium carbonate is used as the common synthetic fungicide against green and blue molds of Lemon. It is allowed as safe Food additive under European and American regulations. Curing treatment is currently practiced to control post harvest diseases.

Research Workers: M. Asghar
Zarina Yasmin
Farah Shamim

Project Duration: 2013 – 2016

Location: Post Harvest Research Centre, AARI, Faisalabad

Treatments:
T_0 Control
T_1 Curing at 33^{o}C for 24 hours
T_2 Dipping in Sodium Carbonate solution 2000ppm for 3 min
T_3 Curing at 33^{o}C and dipping in Sodium Carbonate solution 2000ppm for 3 min

Layout Design: CRD (Factorial)
No. of Replications = 3
No. of treatments = 4

	Plan of Work	Lemon (Eureka) were harvested from the orchard of Horticultural Research Institute Faisalabad. Fruits were washed and sorted. After washing, subjected to above-mentioned treatments and then stored at 10^oC with relative humidity (90-95) % up to maximum acceptable period. Data regarding skin color, firmness, acidity, pH and weight loss was recorded after 3 days interval. Fungal count was calculated by incubating fruit samples at 40^oC.
	Previous Year's Results	Lemons projected storage life of twenty one days after curing at 33^oC and dipping in 2000ppm Sodium Carbonate solution for 3 min. (T_3) Table-3
10	**TITLE**	**CONTROL OF CHILLING INJURY AND QUALITY RETENTION IN PLUM BY THE USE OF 1-MCP**
	Objectives	Application of 1-MCP could provide adequate post storage quality, avoid cold storage disorders of Plum,
	Importance	Plums are susceptible to chilling injury and loss of firmness occurred during prolonged cold storage. 1-MCP application control chilling injury, flesh browning and softness, inhibits ethylene action and tissue senescence. Previously, significant results were obtained on tomatoes, Guava and Apple by 1-MCP application.
	Project duration	2013-2016
	Research Workers	Farah Shamim M.Asghar Zarina Yasmin
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 0.5µL/L 1-MCP at 0^0C for 24 hours T_2 0.5µL/L 1-MCP at 0^0C for 6 hours T_3 0.5µL/L 1-MCP at 10^0C for 24 hours T_4 0.5µL/L 1-MCP at 10^0C for 6 hours
	Layout Design	CRD (Factorial) No. of Replications = 3 No. of treatments = 5
	Plan of Work	Plums (Santa Roza) was purchased at hard mature stage from selected orchard, and then shifted to the Post harvest Laboratory. After sorting and grading, soft plum was discarded. Washing was done with TBZ (200ppm for 2 min) then fruits were subjected to above-mentioned treatments and stored at 4^0C up to maximum acceptable period. Data regarding color, total sugar, firmness, TSS, weight loss was be recorded after 2 days interval. Ethylene and CO_2 concentration was recorded at the beginning and end of the project.
	Previous Year's Results	Plums treated with 0.5µL/L 1-MCP at 10^0C for 24 hours and stored at 4^0C presented maintained quality for a period of twenty seven days. (T_3) Table-4
11	**TITLE**	**EFFECT OF DIFFERENT PRE-COOLING METHODS ON THE SHELF LIFE OF SPINACH**
	Objectives	To extend shelf life and marketability of spinach. To maintain quality attributes for marketing and longer shelf life.
	Importance	Spinach is an edible flowering plant with high nutritional value containing Vit A, C, K and others minerals.

	Research Workers	M. Asghar Zarina Yasmin Farah Shamim Irrum Babu
	Project Duration	2012 – 2014
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 Hydro-cooling at 10^0C + packing in perforated polythene bags (0.2mm) 20 perforations/bag T_2 Room cooling at 10^0C packing in perforated polythene bags (0.2mm) 20 perforations/bag T_3 Forced air cooling at 10^0C packing in perforated polythene bags (0.2mm) 20 perforations/bag
	Layout Design	CRD (Factorial) No. of Replications = 3 No. of treatments = 4
	Plan of Work	Spinach will be hand harvested from Vegetable Research Institute by cutting with knife. Spinach leaves will be shifted to the Post harvest Laboratory. After sorting and grading, tender and green spinach will be washed with anti fungal solution i.e. sodium hypochlorite @ 50 ppm for 2 minutes. After washing, Spinach will be subjected to above-mentioned treatments and stored at 10^0C up to maximum acceptable period. Data regarding color, Vitamin C, Fiber content %, weight loss will be recorded after 2 days interval.
	Previous Year's Results	Quality of Forced air cooled Spinach was found best. (T_3) Table 5
12	**TITLE**	**IMPACT OF OXALIC ACID ON POST HARVEST QUALITY OF PEACH FRUIT**
	Objectives	To evaluate the effects of oxalic acid on physiology of Peach fruit during storage at room temperature.
	Importance	Peach fruit is very perishable during storage at room temperature due to rapid rate of ripening and deterioration. Recently, oxalic acid is considered as anti-oxidant and anti-browning agent for harvested commodities.
	Research Workers	Irrum Babu Farah Shamim M. Asghar M. Liaqat Ali
	Project Duration	2012 – 2015
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 5 mM Oxalic acid T_2 7 mM Oxalic acid T_3 10 mM Oxalic acid
	Layout Design	CRD (Factorial) No. of Replications = 3 No. of treatments = 4

	Plan of Work	Peach fruit (sun crest) will be collected from local market. After sorting and grading, fruit will be dipped into different concentrations of oxalic acid for 10 min as mentioned above, packed in polyethylene bags (0.2mm thickness, 20perforations/bag) and stored at 4^0C up to maximum acceptable period. Data regarding skin color, firmness, Vitamin C, acidity, TSS and weight loss will be recorded two days.,
	Previous Year's Results	Fruit treated with 5mM Oxalic acid was found good in storability and eating quality. (T_1) Table 6
13	**TITLE**	**IMPACT OF CHITOSAN FILM COATINGS COMBINED WITH PACKING ON QUALITY ATTRIBUTES OF CARROTS (*Daucus carota*)**
	Objectives	To limit transpiration rate and to minimize adverse changes that lower the market value and taste properties of Carrot.
	Importance	Carrot is an important winter root vegetable, rich in Vitamin A (Beta Carotene), Vitamin K, E and other minerals (Potassium and Manganese)
	Research Workers	Farah Shamim Irrum Babu M. Liaqat Ali
	Project Duration	2012 – 2015
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 1% Chitosan Coating + packing in polyethylene bags T_2 0.5% Chitosan Coating + packing in polyethylene bags T_3 1% Chitosan Coating + packing in Styrofoam trays wrapped with PVC shrink film T_4 0.5% Chitosan Coating + packing in Styrofoam trays wrapped with PVC shrink film
	Layout Design	CRD (Factorial) No. of Replications = 3 No. of treatments = 5
	Plan of Work	Carrots (T-29) will be procured from Vegetable Research Institute. After sorting and grading carrots will be washed with chlorinated water and subjected to treatments mentioned above. After treatment, vegetables will be stored at 4^oC and 90-95 % RH up to maximum acceptable period. Quality parameters like weight loss, Firmness, TSS and colour will be recorded after 3 days interval.
	Previous Year's Results	Carrots treated with 1% Chitosan and packed in polyethylene bags were found best in quality for 24 days. (T_1) Table 7
14	**TITLE**	**APPLICATION OF DIFFERENT POST HARVEST TREATMENTS ON QUALITY RETENTION OF BELL PEPPER**
	Objectives	To prolong post harvest life by maintaining skin firmness and lowering pathogenic load in Bell pepper.

	Importance	Bell pepper is an important vegetable crop worldwide rich in vitamin A and C. Main factors in their limited marketing are rapid water loss, decay, color and firmness loss. Quality degradation of bell peppers during storage is very common. Different post harvest treatments i.e., hot water dipping, calcium chloride treatment, packing with low temperature storage can control chilling injury, shriveling, color and firmness changes and suppress microbial growth.
	Research Workers	Zarina Yasmeen Farah Shamim Malik Asghar
	Project Duration	2012 – 2015
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 HWT at 65^0C for 3min + packed in PE bags (20 µm) T_2 Calcium chloride dipping (2%) + packed in PE bags (20 µm) T_3 HWT at 65^0C for 3min + Calcium chloride dipping (2%) + packed in PE bags (20 µm) T_4 HWT at 65^0C for 3min + packed in Polystyrene trays T_5 Calcium chloride dipping (2%) + packed in Polystyrene trays T_6 HWT at 65^0C for 3min + Calcium chloride dipping (2%) + packed in Polystyrene trays
	Layout Design	CRD (Factorial) No. of Replications = 3 No. of treatments = 7
	Plan of Work	Bell peppers (California Wonder) at mature green stage will be procured from Progress Farmer (Haji Sons) Chinot. After manual grading and sorting, above mentioned treatments will be applied along with anti fungal solution (Sodium Hypochlorite 1%) and stored at 10^0C with 85-90% RH for further studies. Data regarding weight loss percentage, Color, firmness, acidity, TSS, Vitamin C and decay incidence % will be determined after five days interval.
	Previous Year's Results	Bell pepper treated with Hot water, dipped in Calcium chloride and packed in Polystyrene trays were found best for 16 days. (T_5) Table 8
15	**TITLE**	**EFFECT OF CHITOSAN COATING ON QUALITY RETENTION OF APRICOT FRUIT DURING LOW TEMPERATURE STORAGE**
	Objective	To prolong shelf life by controlling moisture loss, respiration rate and by lowering pericarp softening
	Importance	Apricot is fragile fruit having short storage life (3-5 days at ambient condition, 2-4 weeks at cold storage). Due to increase in apricot demand and export worldwide, practical methods of packaging and coating are necessary to improve post harvest quality of apricot.
	Research Workers	M. Asghar Farah Shamim Zarina Yasmeen
	Project Duration	2011 – 2014
	Location	Post Harvest Research Centre, AARI, Faisalabad

	Treatments	T_0 Control T_1 0.5% chitosan coating T_2 1.0% chitosan coating T_3 1.5% chitosan coating
	Layout Design	CRD Factorial No. of Replications = 3 No. of treatments = 4
	Plan of Work	Fruit of apricot (sarbghal) at commercial maturity stage will be procured from market. Fruit will be washed with 1% $Cacl_2$. After washing fruits will be dipped into different concentration of chitosan solution for one minute as mentioned above. Fruit will be then dried at 25 $\pm$2 ^{0}C for 2 hours then store at 0^{0}C and 80% RH up to maximum acceptable level. Data will be recorded for TSS, Acidity, pH, Firmness and Color after 3 days interval up to maximum acceptable period.
	Previous Year's Results	Apricot coated with 1.0% chitosan maintained good quality and firm texture for a period of 25 days. (T_2) Table 9
16	**TITLE**	**STUDIES ON COMBINED EFFECT OF IRRADIATION AND CHITOSAN COATING ON QUALITY OF MANGO DURING STORAGE**
	Objective	To reduce decay and maintain quality attributes in order to extend marketing duration.
	Importance	Irradiation in fruits can alone induce respiration rate and ethylene production but edible wax coating can combat this problem with reduced water loss and maintain pericarp softness.
	Research Workers	Irrum Babu Zarina Yasmin Farah Shamim
	Project Duration	2011 – 2014
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 Gamma radiation @ 350 Gray T_2 1.5% chitosan coating for 1 min T_3 1.5% chitosan coating + Gamma radiation @ 350 Gray
	Layout Design	CRD Factorial No. of Replications = 3 No. of treatments = 4
	Plan of Work	Fully mature mango fruit Sindhri variety will be harvested from selected orchards of progressive farmers. After washing fruits will be subjected to different treatments of chitosan and irradiation as mentioned above. Fruit will be stored at 25 $\pm$2^{0}C. Data will be recorded for TSS, Acidity, pH, Firmness and Color development after 5 days interval up to maximum acceptable period.
	Previous Year's Results	Fruits T_3 (1.5% chitosan coating + Gamma radiation @ 350 Gray) maintained quality for a period of 25 days. (T_3) Table 10
17	**TITLE**	**CONTROL OF STORAGE SCALDING IN APPLES BY USE OF CHEMICALS**
	Objectives	To prevent superficial scald development and quality retention in apples during storage

	Importance	Scald is the term applied to skin disorder caused due to chilling injury in apple. At low temperature storage, serious chilling injury related symptoms appears on surface in the form of grey or brown streaks. Use of 1-MCP and DPA may inhibit scalding by reducing ethylene production and oxidation.
	Research Workers	Zarina Yasmin Irrum Babu M. Asghar
	Project Duration	2011 – 2014
	Location	Post Harvest Research Centre, AARI, Faisalabad
	Treatments	T_0 Control T_1 Diphenylamine @ 2 % T_2 1- Methylcyclopropane @ 1ppm T_3 DPA 1 % +1-MCP(@ 0.5ppm)
	Layout Design	CRD (Factorial) No. of Replications = 3 No. of treatments = 4
	Plan of Work	Apples (Red delicious) variety at mature stage will be harvested from the Hill Fruit Research Station, Tret, Murree. After sorting and grading fruit will be subjected to above mentioned treatments of diphenylamine (DPA) for 5minutes and 1-methylcyclopropane (1-MCP) for 12 hours and stored under controlled conditions at 0 $\pm$2 ^{0}C and RH 85-95%. Data regarding color development, total soluble solids, weight loss, pH and percent acidity will be recorded after fifteen days interval.
	Previous Year's Results	Fruits treated with both 1-MCP and DPA maintained good quality in terms of firmness and acidity up to 6 months than DPA. (T_3) Table 11
18	**TITLE**	**POST HARVEST QUALITY EVALUATION OF GRAPES AFTER ETHANOL APPLICATION**
	Objective	To elucidate effects of ethanol dipping on mold incidence and fruit quality
	Importance	Grapes are vulnerable to post harvest decay due to mold attack even at –0.5 to 0^{0}C during storage. Previously, sulfur dioxide was used to control mold growth but it is restricted due to its residual effects. Recently ethanol emerges as powerful sanitizing agent.
	Research Workers	Farah Shamim Zarina Yasmin Irrum Babu
	Project Duration	2011-2014
	Location	Post Harvest Research Centre, AARI Faisalabad
	Treatments	Treatments T_0 Control T_1 Immersed in 35% v/v ethanol at 20^{o}C for 1 minutes T_2 Immersed in 35% v/v ethanol at 30^{o}C for 1 minutes
	Layout Design	No. of Replications = 3 No. of Treatments = 3 CRD (Factorial)

	Plan of Work	Grapes (Gola variety) will be procured from the local market. After sorting and grading fruit bunches will be dipped in ethanol solution according to treatments mentioned above. Surface dried fruits packed in polyethylene bags of 0.22mm thickness will be stored in cold chambers at 0^oC ± 2 and relative humidity 85-90 % up to marketable life. Data regarding weight loss, decay %, pH, % acidity, TSS, total sugar and viable mold count will be evaluated after two days interval.
	Previous Year's Results	No grey mold attack was detected in ethanol treated grapes at 30^oC (T_2) after 16 days storage. Table 12
19	**TITLE**	**HOT WATER APPLICATION IN COMBINATION WITH FUNGICIDE ON QUALITY ATTRIBUTES Of KINNOW DURING COLD STORAGE**
	Objective	To assess the effects of hot water treatment and fungicide on Kinnow fruit quality and decay during storage.
	Importance	Chilling injury is prevalent physiological disorder caused by low temperature in oranges that result in considerable quality loss. Heat treatment in combination with fungicide before cold storage can induce tolerance to chilling and minimal decay by fungus in Citrus fruit.
	Research Workers	Farah Shamim Irrum Babu M. Asghar Zarina Yasmin
	Project Duration	2011-2014
	Location	Post Harvest Research Centre, AARI Faisalabad
	Treatments	Treatments T_0 Control T_1 Hot water treatment at 50^oC for 3minutes T_2 Treat with TBZ @ 1000PPM T_3 Hot water treatment at 50^oC for 3 minutes + TBZ @ 1000PPM
	Layout Design	No. of Replications = 3 No. of Treatments = 4 CRD (Factorial)
	Plan of Work	Mature oranges will be procured from the Citrus Research Institute, Sargodha. After sorting and grading fruit will be immersed in hot water and TBZ according to treatments mentioned above. Air dried fruits will be stored at 5^oC and 85-90 % relative humidity up to marketable life. Data regarding weight loss, decay %, pH, Acidity, TSS, Vitamin C and Juice % will be evaluated after two-week interval.
	Previous Year's Results	Hot water treatment of oranges at 50^oC for 3 minutes + TBZ @ 1000PPM predicted good quality for eighty four days. (T_3) Table 13
20	**TITLE**	**DEVELOPMENT, OPTIMIZATION AND TECHNOLOGY DISSEMINATION OF INDIGENOUS BASED SKIN COATING MATERIAL (SCM) FOR FRUITS AND VEGETABLES (PARB PROJECT)**

	Objectives	• To Prepare and optimize SCM for fruits and vegetables to improve their shelf life and cosmetics view for domestic and export marketing. • To develop appropriate application technology for locally developed SCMs (Skin Coating Material) • To demonstrate, promote and commercialize locally developed SCM
	Research Workers	Muhammad Azhar Ali Abdul Rahim Khan Atta Muhammad Arif Adnan Zulfiqar
	Project Duration	2009 – 2013
	Location	Post Harvest Research Centre, AARI, Faisalabad Biochemistry Department, University of Agriculture Faisalabad
	Treatments	T_0 Commercial wax T_1 SCM_1 T_2 SCM_2
	Layout Design	CRD Factorial No. Replications = 3 No. Of treatments = 3
	Plan of Work	Different indigenous based skin coating material materials (Gums, Oils and resins etc) suitable for the preparation of will be purchased from the local market. The remaining supporting ingredients like bee wax, rice bran wax, castor wax and jujube wax will also be used to improve the quality of Skin Coating Material. This skin coating material (SCM) will be applied on Grapefruit, Kinnow, Tomato, Mango, Peach, Cucumber, Cantaloupe and Bell pepper for comparison with commercial wax. Data will be recorded for TSS, Acidity, pH, Firmness and Color development and sensory evaluation after 5 days interval up to maximum acceptable period. Data will be analyzed statistically to observe the level of significance between the treatments.
21	**TITLE**	**TRAINING ON POST HARVEST TECHNOLOGY OF FRUITS AND VEGETABLES**
	Objectives	To educate the trainers for training (TOT), training of farmers (TOF) and community relating to trade of horticulture sector harvesting, handling, grading, packing, storage and marketing techniques of different fruits & vegetables.
	Research Workers	All technical staff
	Project Duration	Continuous
	Location	Major fruit and vegetable growing areas of the Punjab province Post Harvest Research Centre, AARI, Faisalabad
	Plan of Work	Different training programs will be arranged and conducted in the collaboration of other stake holders. The training will include lectures and practical demonstrations in respect of harvesting, handling, grading, packing, storage and processing techniques of fruits and vegetables
	Previous Year's Results	Training programmes/workshops at 10 different places were arranged throughout the Punjab on post harvest technology of fruits and vegetables and 682 participants benefited.