







Model Curriculum

Operator-Reaper, Thresher and Crop Residue Machinery

SECTOR: AGRICULTURE & ALLIED

SUB-SECTOR: AGRICULTURE CROP PRODUCTION

OCCUPATION: FARM MACHINERY, EQUIPMENT OPERATION

AND MAINTENANCE

REF ID: AGR/Q1105, V1.0

NSQF LEVEL: 4















Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

AGRICULTURE SKILL COUNCIL OF INDIA

forthe

MODEL CURRICULUM

Complying to National Occupational Standards of Job Role/Qualification Pack: 'Operator-Reaper, Thresher and Crop Residue Machinery'

QP No. 'AGR/Q1105 NSQF Level 4'

Date of Issuance: April 24th, 2017

Valid up to: March 31st, 2020

* Valid up to the next review date of the Qualification Pack

Authorised Signatory (Agriculture Skill Council of India)









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Operator-Reaper, Thresher and Crop Residue Machinery

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "Operator-Reaper, Thresher and Crop Residue Machinery", in the "Agriculture & Allied" Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Operator-Reaper, Thresher and Crop Residue Machinery		
Qualification Pack Name & Reference ID.	AGR/Q1005, v1.0	AGR/Q1005, v1.0	
Version No.	1.0 Version Update Date		
Pre-requisites to Training	Class 8, preferably		
Training Outcomes	 Operate reapondarious crops. Operate threst on various crops. Carry out field equipment, operate control of agriculture greasing, cross. Practice healt 	programme, participants er: handling of reaper during ther: handling of thresher deposed residue management: see the equipment the equipment the equipment that the equipment that machineries: periodic chest checking for any leakages the and safety at the work periodic measures in terms of periodic that the machineries is the machineries in the machineries in the machineries is the machineries in the machineries in the machineries is the machineries in the machineries in the machineries is the machineries in the machineries in the machineries is the machineries in the machineries in the machineries is the machineries in the machine	g different operation on uring different operation elect appropriate naintenance ecking, tightening, is etc.









This course encompasses $\underline{4}$ out of $\underline{4}$ Compulsory NOS (National Occupational Standards), $\underline{1}$ out of $\underline{1}$ Optional NOS of "Operator-Reaper, Thresher and Crop Residue Machinery" Qualification Pack issued by "Agriculture Skill Council of India".

COMPULSORY NOS:

Sr. No.	Module	Key learning outcomes	Equipment Required
1	Introduction Theory Duration (hh:mm) 02:00 Practical Duration (hh:mm) 00:00 Corresponding NOS Code Bridge Module	 Understand general discipline in the class room and workshop (Do's & Don'ts) Study the scope and importance of farm mechanization industry in India Familiarize with different farm machineries' manufacturers and their brands/models Understand the role of a Operator-Reaper, Thresher and Crop residue Machinery and the progression pathways for the same 	Laptop, white board, marker, projector and video films and Presentations
2	Carry out operation of reaper Theory Duration (hh:mm) 18:00 Practical Duration (hh:mm) 40:00 Corresponding NOS Code AGR/N1115	 State the importance of reaper Enlist the types of reaper Select vertical conveyor reaper or self propelled reaper based on crop variety, maturity of crop, crop moisture, crop condition and crop density Identify steps of fitting the reaper with the tractor/ engine Mount the reaper in the tractor State the importance of alignment of reaper Check the alignment of the reaper with the prime mover Carry out tightening of nuts and bolts with proper tools Apply lubrication on parts of reaper as per operator's manual Check the level of oil/water in IC engine or tractor Set the adjustment of the reaper as per the operator's manual Prepare agricultural land as per requirement of farm mechanization practices Identify the steps for operating tractor operated /engine operated reaper for harvesting crops Identify precautions to be taken during operation of reaper in field Operate the reaper in field Carry out recording and measurement of operating parameters during operations of the 	Laptop, white board, marker, projector vertical conveyor reaper or self propelled reaper









Sr. No.	Module	Key learning outcomes	Equipment Required
		 Record the impact on crop variety Identify operating troubles during operation such as blocked discharge, cutting knife and conveyor belts stopped, loss of power Make corrective adjustments in accordance with the operator's manual Identify need for maintenance and repair of the reaper Make corrective adjustments in accordance with the operator's manual Inspect and clean the guards Inspect the conveyor belt for damages and replace if necessary Check the tension of v-belt over the roller pulley Inspect the cutter bar, knife, star wheels, pressure springs and lugs for damage and take corrective actions Lubricate all moving parts Repaint surface where paint has worn off Familiarize with the road signal and communication signs used for tractors and agricultural machinery 	
3	Carry out operation of Thresher Theory Duration (hh:mm) 20:00 Practical Duration (hh:mm) 40:00 Corresponding NOS Code AGR / N1116	 Select the right thresher based on the type, capacity and suitability to crops Check the direction of wind and install thresher along the direction of the wind Ensure that the thresher is at level by fixing pegs around the wheels Mount the prime mover on the frame and check alignment Check belt technician and accordingly correct as per the operator's manual Carry out adjustments for speed of threshing cylinder, cylinder concave clearance, speed of blower, air flow, sieve slope and stroke length and speed of crank according to operator's manual Ensure all nuts and bolts are tightened Check the level, alignment of thresher and ensure appropriate belt tension Check the proper size of sieve and conclave Check the direction of rotation of cylinder 	tractor/power tiller harvesting/reaping equipments threshing/shelling equipments trolleys for material handling repairing tools service tools









Sr. No.	Module	Key learning outcomes	Equipment Required
		 Ensure lubrication of parts as per operator's manual Check the level of oil/water in I/c engine or tractor Start the prime mover and thresher Measure the speed of the thresher using a prime mover and ensure the desired speed is maintained Feed crop slowly and uniformly and collect the clean grain after 1 hour of operation Measure threshing efficiency and change cylinder speed to ensure maximum efficiency Ensure safety precautions as per operator's manual during operation of thresher Carry out basic repair and maintenance as per operator's manual Clean the thresher of grain, chaff, etc. during idle period Carry out regular lubrication of moving parts to reduce wear and tear Inspect and tighten all nuts and bolts 	
4	Carry out field residue management Theory Duration (hh:mm) 20:00 Practical Duration (hh:mm) 40:00 Corresponding NOS Code AGR/N1117	 Select appropriate farm machinery to facilitate the application of residues such as straw chopper, straw baler, happy seeder, chaff cutter, etc. Check for proper functioning of the machinery by performing pre start up checks Carry out rectifying action if necessary Stack the straw neatly for pickup Choose the mode of transport for transportation of straw to the storage facility such as tractors, trailers Check functioning of chain conveyor, pressing rollers, and upper and lower feed rollers Identify and familiarize self with different sub assemblies and components, materials, construction of straw choppers Operate the machine as per standard operating instructions given Identify faults and take corrective action Pick up straw/hay from the ground using baler teeth Ensure that once the baler chamber is full with hay/straw, the hay wraps and 	straw chopper, straw baler, seeder, chaff cutter, straw reaper, etc









Sr. No.	Module	Key learning outcomes	Equipment Required
		 Forms a cylinder Ensure that protective coating has been attached to the cylindrical bundle of hay so that it does not come apart during movement Transport the able of straw/hay to the designated area of storage Select the appropriate hard or power operated chaff cutters Check for adjustments of chaff cutter such as feeding chute and mechanism, feeding rollers, cutting gap, length of cut, etc. Identify common faults and take rectifying action Record the quality of output Identify the need for repair and maintenance like replacement of gears, sharpening of cutting blade, etc. Develop inventory for amount of residues generated in different crops Identify the major uses of crop residues Quantify proportion of residue of the crops based on cropping systems, soil, and climate 	
5	Maintain Health & Safety at the work place Theory Duration (hh:mm) 10:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code AGR/N9903	 Undertake basic safety checks before operation of all machinery and vehicles and report all potential hazards to the supervisor Enlist the precautionary measures during field operation of farm machinery Explain the importance and use of protective clothing or equipment Handle the protective clothing or equipment during use of equipment ldentify appropriate emergency procedures Report timely to appropriate person Employ general safety and first aid practice Familiarize with dangerous machines regulation act 	Personal protective equipment like: Helmet / head gear, Cotton / woolen safety gloves, Safety boots, Safety Harness; First Aid Kit: Bandages, Adhesive bandages, Betadine Solution / ointment, Pain relief spray / ointment, Antiseptic liquid; Phone directory, Search lights, fire extinguisher
	Total Duration: Theory Duration (hh:mm) 70:00	Unique equipment required: vertical conveyor reaper or self propelled re straw baler, seeder, chaff cutter, straw reap equipment like: Helmet / head gear, Cotton Safety boots, Safety Harness; First Aid Kit: bandages, Betadine Solution / ointment, Pa	er, Personal protective / woolen safety gloves, Bandages, Adhesive









Sr. No.	Module	Key learning outcomes	Equipment Required
	Practical Duration (hh:mm) 130:00	Antiseptic liquid; Phone directory, Search liq tractor/power tiller, harvesting/reaping equip threshing/shelling equipments, trolleys for n repairing tools, service tools	oments,

OPTIONS (Optional to choose any or all or none)

OPTION 1: Carry out operation of crop residue management machinery

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	Carry out operation of crop residue management machinery Theory Duration (hh:mm) 10:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code AGR/N1118	 Select and use appropriate machinery for various works Select the cleaning machine as per requirement Explain types of cleaner/ grader like air screen cleaners, rotary cleaners, etc. based on suitability to farm produce Check for adjustment and alignment of feed rate, sieve slope, air flow rate, frequency of oscillations Carry out operation of straw chopper Carry out operation of straw baler Maintain record the quality of output of the grain Identify common faults and take rectifying action State importance of drying Explain drying method like convection/conduction drying, vacuum drying and the appropriate dryer like batch dryer, LSU dryer, etc. Check for adjustments of air temperature, grain flow rate in accordance with operator manual Select the appropriate type of mill like based on the type of crop for example dal mill, rice mill, four mills, etc. Carry out operation of milling and oil expelling machinery basis crop type Maintain record the quality of output Identify common faults and take rectifying action Carry out regular maintenance of the machineries and attachments 	Computer, Audiovisual aids, Projector, Post harvest machinery, cleaner/ grader like air screen cleaners, rotary cleaners, batch dryer, LSU dryer, grader, straw chopper, straw baler, dal mill, rice mill, flour mill, oil ghani, screw expeller, hydraulic press, etc
	OPTION 1 : Total Duration Theory Duration 10:00	Unique Equipment Required: Computer, Audio-visual aids, Projector, Post had cleaner/ grader like air screen cleaners, rotary LSU dryer, grader, straw chopper, straw baler, flour mill, oil ghani, screw expeller, hydraulic pr	cleaners, batch dryer, dal mill, rice mill,









Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Practical Duration 10:00		

GRAND Total Duration	Unique Equipment Required for the QP:
	Laptop, white board, marker, projector, vertical conveyor reaper or
Minimum Duration for	self propelled reaper, straw chopper, straw baler, seeder, chaff
the QP= <u>200 hrs</u>	cutter, straw reaper, Personal protective equipment like: Helmet /
Theory: 70 hrs	head gear, Cotton / woolen safety gloves, Safety boots, Safety
Practical: 130 hrs	Harness; First Aid Kit: Bandages, Adhesive bandages, Betadine
	Solution / ointment, Pain relief spray / ointment, Antiseptic liquid;
Maximum Duration for	Phone directory, Search lights, fire extinguisher, tractor/power tiller,
the QP= <u>220 hrs</u>	harvesting/reaping equipments, threshing/shelling equipments,
Theory: 80 hrs	trolleys for material handling, repairing tools, service tools, vertical
Practical: 140 hrs	conveyor, reaper or self propelled reaper, cleaner/ grader like air
	screen cleaners, rotary cleaners, dryer, straw chopper, straw baler,
	repairing tools, Post harvest machinery, cleaner/ grader like air
	screen cleaners, rotary cleaners, batch dryer, LSU dryer, grader,
	straw chopper, straw baler, dal mill, rice mill, flour mill, oil ghani,
	screw expeller, hydraulic press

(This syllabus/ curriculum has been approved by Agriculture Skill Council of India)









Trainer Prerequisites for Job role: "Operator-Reaper, Thresher and Crop Residue Machinery" mapped to Qualification Pack: "AGR/Q1105, v1.0"

Sr. No.	Area	Details		
1	Description	Trainer is responsible for educating the trainees –handling of reaper, thresher during different operation on various crops; carry out field residue management and maintenance and minor repair and periodical maintenance of agriculture machineries.		
2	Personal Attributes	Trainer should be Subject Matter Expert. He/ she should have good communication, leadership, observation and practical oriented skills.		
3	Minimum Educational Qualifications	10+2 with Science		
4a	Domain Certification	Certified for Job Role: "Operator-Reaper, Thresher and Crop Residue Machinery" mapped to QP: "AGR/Q1105, v1.0". Minimum accepted score is 80%.		
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q0102". Minimum accepted % as per respective SSC guidelines is 80%.		
5	Experience	 B Tech in Mechanical / Agriculture engineering B Sc Agriculture with 1 year of relevant work experience and 2 years of total work experience Diploma / ITI (Mechanical / Agriculture engineering) with 3 years of relevant work experience 10+2 with Science and having any Certificate course in Farm Mechanization with 5 years of relevant work experience 		









Annexure: Assessment Criteria

Job Role Operator-Reaper thresher and crop residue machinery

Qualification Pack AGR/Q1105, v1.0

Sector Skill Council Agriculture Skill Council of India

Guidelines for Assessment

- 1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
- 2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
- 3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
- 4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
- 5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
- 6. To pass the Qualification Pack , every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
- 7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Compulsory		Marks Allocation			
Total Marks: 400			Warks A	Allocation	
Assessment outcomes	Assessment criteria for outcomes	Total Marks	Out Of	Theory	Skills Practical
AGR/N1115 Carry out operation of reaper	PC1. select the appropriate type of reaper, vertical conveyor reaper or self propelled reaper based on: crop variety maturity of crop crop moisture crop condition crop density	100	5	2	3
	PC2. fit the reaper with the tractor/engine based on the type of reaper		5	2	3
	PC3. check the alignment of the reaper with the prime mover		5	2	3
	PC4. ensure all nuts and bolts are tightened		4	1	3
	PC5. ensure lubrication of parts as per operator's manual		4	1	3
	PC6. check the level of oil/water in IC engine or tractor		5	1	4
	PC7. set the adjustment of the following in accordance with operator's manual		5	1	4









	· reel				
	· cutter bar				
	· binding and tying mechanism				
	· conveyor tension				
	· bundle size				
	PC8. ensure field patterns and field preparations are made prior to operation		5	2	3
	PC9. switch on the prime mover, tractor or engine		5	1	4
	PC10. operate the reaper for harvesting crops		4	1	3
	PC11. measure and record parameters during operations of the reaper		5	1	4
	PC12. record the impact on crop variety		4	1	3
	PC13. identify operating troubles during operation such as blocked discharge, cutting knife and conveyor belts stopped, loss of power		5	1	4
	PC14. make corrective adjustments in accordance with the operator's manual		5	2	3
	PC15. identify need for minor maintenance and repair of the reaper		5	2	3
	PC16. inspect and clean the guards		4	1	3
	PC17. inspect the conveyor belt for damages and replace if necessary		5	1	4
	PC18. check the tension of v-belt over the roller pulley		5	2	3
	PC19. inspect the cutter bar, knife, star wheels, pressure springs and lugs for damage and take corrective actions		5	2	3
	PC20. lubricate all moving parts		5	1	4
	PC21. repaint surface where paint has worn off		5	2	3
			100	30	70
2. AGR/N1116 Carry out operation of thresher	PC1. select the right thresher based on the type, capacity and suitability to crops	100	5	1	4
	PC2. check the direction of wind and install thresher along the direction of the wind		5	1	4
	PC3. ensure the thresher is at level by fixing pegs around the wheels		5	2	3
	PC4. mount the prime mover on the frame and check alignment		4	1	3
	PC5. check belt tension and correct accordingly as per the operators manual		5	2	3









	PC6. carry out adjustments for speed of threshing cylinder, cylinder concave clearance, speed of blower, air flow, sieve slope and stroke length and speed of crank according to operator's manual		5	1	4
	PC7. ensure all nuts and bolts are tightened		4	1	3
	PC8. check the level, alignment of thresher and ensure appropriate belt tension		5	2	3
	PC9. check the proper size of sieve and conclave		5	2	3
	PC10. check the direction of rotation of cylinder		4	1	3
	PC11. ensure lubrication of parts as per operator's manual		4	1	3
	PC12. check the level of oil/water in IC engine or tractor		5	2	3
	PC13. start the prime mover and thresher		5	2	3
	PC14. measure the speed of the thresher using a prime mover and ensure the desired speed is maintained		5	2	3
	PC15. feed crop slowly and uniformly and collect the clean grain after 1 hour of operation		5	2	3
	PC16. measure threshing efficiency and change cylinder speed to ensure maximum efficiency		5	2	3
	PC17. ensure safety precautions as per operator's manual during operation of thresher		5	1	4
	PC18. carry out minor repair and maintenance as per operator's manual		5	1	4
	PC19. clear the thresher of grain, chaff, etc. during idle period		5	1	4
	PC20. carry out regular lubrication of moving parts to reduce wear and tear		5	1	4
	PC21. inspect and tighten all nuts and bolts		4	1	3
0. 400/4117		125	100	30	70
AGR/N1117 Carry out field residue management	PC1. select appropriate farm machinery to facilitate the application of residues such as straw chopper, straw baler, chaff cutter, etc	100	5	2	3
	PC2. check for proper functioning of the machinery by performing pre start up checks		4	1	3
	PC3. take rectifying action if necessary		4	1	3
	PC4. stack the straw neatly for pickup		4	1	3
	PC5. choose the mode of transport for transportation of straw to the storage facility such as tractors, trailers		5	2	3









	PC6. pick up straw/hay from the ground using baler teeth		4	1	3
	PC7. ensure that once the baler chamber is full with hay/straw, the hay wraps and forms a cylinder		5	1	4
	PC8. ensure that protective coating has been attached to the cylindrical bundle of hay so that it does not come apart during movement		5	2	3
	PC9. transport the bale of straw/hay to the designated area of storage		4	1	3
	PC10. check functioning of chain conveyor, pressing rollers, and upper and lower feed rollers		4	1	3
	PC11. identify and familiarize self with different sub-assemblies and components, materials, construction of straw choppers		5	2	3
	PC12. operate the machine as per standard operating instructions given		5	1	4
	PC13. identify faults and take corrective action wherever necessary		4	1	3
	PC14. select the appropriate hard or power operated chaff cutters		5	2	3
	PC15. check for adjustments of chaff cutter such as feeding chute and mechanism, feeding rollers, cutting gap, length of cut, etc.		5	1	4
	PC16. identify common faults and take rectifying action		4	1	3
	PC17. record the quality of output		4	1	3
	PC18. identify the need for minor repair and maintenance like replacement of gears, sharpening of cutting blade, etc.		5	1	4
	PC19. develop inventory of amount of residues generated in different crops		5	2	3
	PC20. identify the major uses of crop residues		4	1	3
	PC21. quantify the permissible amount of residues of different crops which can be incorporated/retained depending on cropping systems, soil, and climate without creating operational problems for the next crop		5	2	3
	PC22. assess the quality of crop residues and their suitability for various purposes		5	2	3
			100	30	70
4. AGR/N9903 Maintain health and safety at the workplace	PC1. undertake basic safety checks before operation of all machinery and vehicles and report all potential hazards to the supervisor	100	6	2	4









GRAND TOTAL	400	400	120	280
CRAND TOTAL	400	100	30	70
PC15. report details of first aid administered in accordance with workplace procedures.		6	2	4
PC14. recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate		6	2	4
PC13. provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques		7	2	5
PC12. use emergency equipment in accordance with manufacturers' specifications and workplace requirements		7	2	5
PC11. follow emergency procedures to company standard / workplace requirements		6	2	4
PC10. follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions for emergency evacuation		7	2	5
PC9. report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger		7	2	5
PC8. perform work in a manner which minimizes environmental damage all procedures and ensure work instructions for controlling risks are followed closely		7	2	5
PC7. recognize risks to bystanders and take action to reduce risk associated with jobs in the workplace		7	2	5
PC6. dispose off waste safely and correctly in a designated area		6	2	4
PC5. use equipment and materials safely and correctly and return the same to designated storage when not in use		7	2	5
PC4. assess risks prior to performing manual handling jobs, and work according to currently recommended safe practices		7	2	5
PC3. read and understand the hazards of use and contamination mentioned on the labels of pesticides/fumigants, etc.		7	2	5
PC2. identify work for which protective clothing or equipment is required and perform those duties in accordance with workplace policy		7	2	5
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OPTIONS Option 1: AGR/N1118 Carry out operation of crop residue management machinery Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment criteria for outcomes	Total Marks	Out Of	Theory	Skills Practical
AGR/N1118 Carry out operation of crop residue management machinery	PC1. select the type of cleaner/ grader like air screen cleaners, rotary cleaners, etc. based on suitability to farm produce	100	6	1	5
	PC2. check for adjustment and alignment of feed rate, sieve slope, air flow rate, frequency of oscillations		6	2	4
	Carry out operation of straw chopper				
	Carry out operation of straw baler				
	PC3. record the quality of output of the grain		6	2	4
	PC4. identify common faults and take rectifying action		5	2	3
	PC5. identify the need for minor repair and carry out regular maintenance of cleaning and grading machinery		6	2	4
	PC6. select the appropriate drying method like convection/conduction drying, vacuum drying and the appropriate dryer like batch dryer, LSU dryer, etc.		6	1	5
	PC7. check for adjustments of air temperature, grain flow rate in accordance with operator manual		6	1	5
	PC8. record the quality of output after drying		6	2	4
	PC9. identify common faults and take rectifying action of drying machinery		6	2	4
	PC10. identify the need for minor repair and carry out regular maintenance of drying machinery		6	2	4
	PC11. select the appropriate type of mill like based on the type of crop for example dal mill, rice mill, four mills, etc.		6	2	4
	PC12. check for adjustments of spacing between plates and rolls, rpm, screen size, etc.		6	2	4
	PC13. select the appropriate oil expelling machinery like oil ghani, screw expeller, hydraulic press, etc. based on the type of crop		6	1	5









	PC14. check for adjustments of feed rate, operating pressure, moisture content and temperature of oil seeds		6	2	4
	PC15. record the quality of output after milling and oil expelling		6	2	4
	PC16. identify common faults and take rectifying action of milling and oil expelling machinery		5	2	3
	PC17. identify the need for minor repair and carry out regular maintenance		6	2	4
_	GRAND TOTAL	100	100	30	70