

User's Manual:

TraceThai.com

Developing Blockchain Application to Enhance

Trade and Economy Project: Phase 2.

Trade Policy and Strategy Office (TPSO). Ministry of Commerce.



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By Thammasat University Research and Consultancy Center (TURAC)

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User's Manual: TraceThai.com

Blockchain Organic Agricultural Product Traceability System

1. Introduction

TraceThai traceability system can be directly accessed via Web Browser such as Chrome, Internet Explorer, Safari, Firefox etc. without any pre-installed program. The system can automatically adjust the display to be fit on both computer screen and mobile screen. Key information such as producer, certifications, production, and distribution are stored in public blockchain. This technology enhances security and reliability of the system data.

TraceThai is beneficial to two groups of users:

(1) Consumers

- Trace the origin of agricultural products
- Confide that the food has been certified from the reliable Certification Body (CB)

(2) Agriculturists/ Operators

- Record, control and monitor the inventory
- E-Document of certification for trading partners
- Create value added to their products

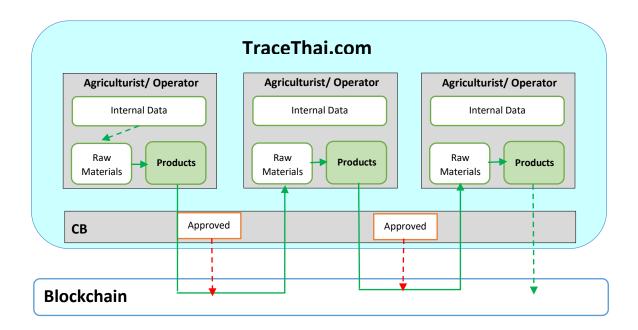
The consumer can trace the origin of the products by scanning the QR Code label or enter Lot Number into TraceThai.com website. The display will show the path on map where the product came from.

TraceThai shows details of the product path including the operator's address, the shipment date. More details can be searched to reach the certificates related to the product. The agriculturist can arbitrarily show the copy of the organic certificates.

The design concept of TraceThai is very flexible that enables the system to be the platform of any agricultural products. There are three steps based on input-output design. Each user account can enter the data into three steps, input, output, and distribution. A single user account can be separated into various profiles to suit with their activities during the process.



The Design Concept of Input-Output Sequence



The data stored on Blockchain will be kept at minimum to save cost. Only the data necessary to trace the origin of product will be kept on blockchain whereas the rest are kept on local server. The data on blockchain are producer identity, production date, certificate, etc. The internal data for each account that are not related to the distribution are stored on the local server.

Summary of TraceThai Operation

- 1. The data entry units are independent to one another. The unit's roles can be more than one. Using different profile in one account, the user can enter data on group members, community enterprise, operator, exporter, or importer. The user will be responsible with the activities they are involved.
- 2. The data entry begins from the input activity, followed by production, and distribution. In case that the input has been forwarded by the producers within the system, the data will be automatically available to the subsequent unit.
- 3. Enter data related to organic certificate into the system, preferably with the picture of the certificate.
- 4. Data privacy has been strictly imposed. Only the necessary data for traceability will be shown to the public while trade secret such as Transaction Certificate (TC) or Transaction Document (TD) will be shown only to the designated trading partners.



2. General User (Agriculturist/ Operator)

This user group might be agriculturalist, community enterprise, trader, exporter, or importer. They are referred as 'Operator' in this manual. Their functions are mainly similar but differ only on the raw material and the final output.

2.1. How to Log In

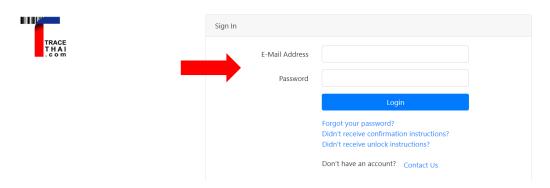
(1) Go to URL: TraceThai.com and click on "Sign In" on the upper right of the screen.



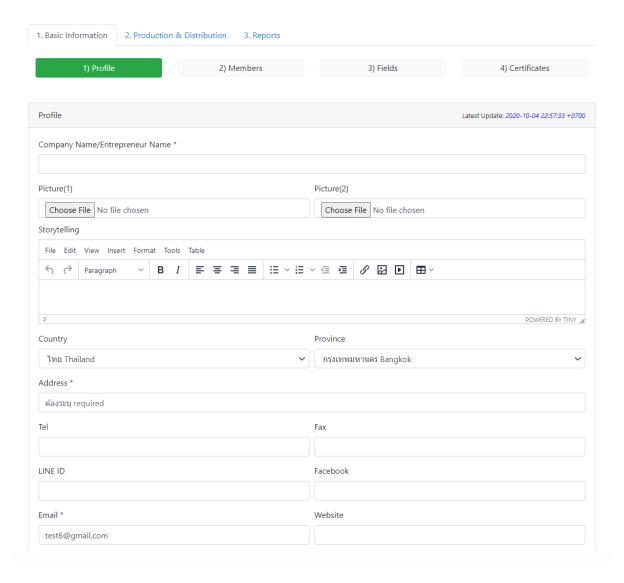




(2) Enter E-mail and password.



(3) For the first time user, the system shows 'Basic Information' tab. The user enters the description of the unit or create the user profile. After user's information has been recorded, they can enter more data on other tabs.





2.2. User Profile

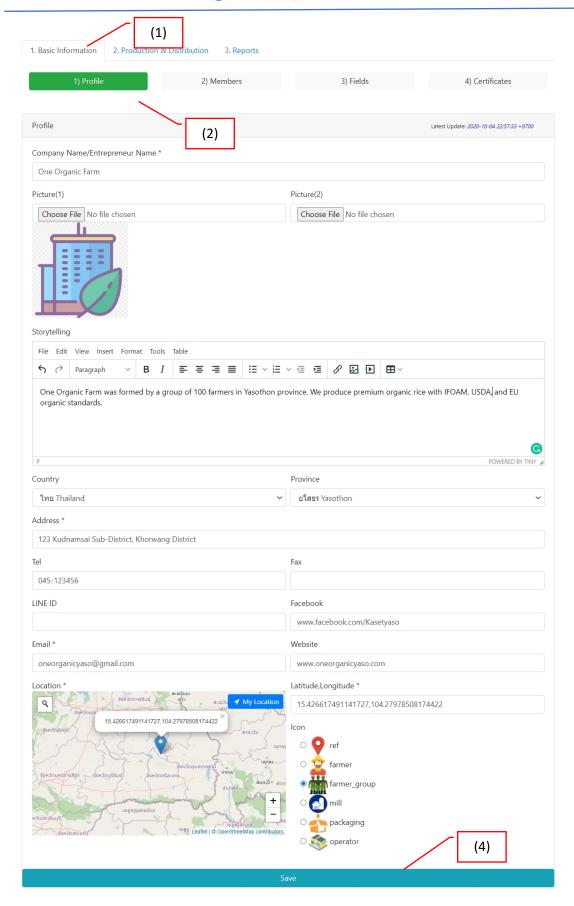
The user can enter data as a single entrepreneur or the community enterprise. Key data are telephone number, location, picture. All the information in this section will appear when the consumer scan QR code of the traceability system.

How to input Profile.

- (1) Click on "1. Basic Information".
- (2) Click on "1) Profile".
- (3) Input the description of the operator.
 - Company Name/ Entrepreneur Name
 - Picture (Click 'Choose File' to upload file from the computer. The user can upload only 2 pictures)
 - Storytelling. The user can add more details about the company or products. This information will be shown on the result page when customers trace back with the traceability system.
 - Country
 - Province
 - Mailing Address
 - Telephone Number
 - Fax Number
 - Line ID
 - Facebook
 - E-Mail (The default is the e-mail used to define the user account. This can be changed to be any e-mail that the user would like to show to the consumer.)
 - Website URL
 - Latitude, Longitude (The data can be entered by three methods. First, select from the map. Second, direct entry. Third, use the location detected by the GPS of the smart phone.
 - Select the icon to be shown on the map.
 - Select type of plants/ products.
- (4) Finish the process by 'Save'.









2.3. How to record 'Member'

In case that the user is the representative of the community enterprise that have many members. The user needs to input the data of all members into TraceThai platform to tally the outputs from all members and allows the system to track the lot number production to the original source of production.

How to record 'Member'

- (1) Click on Tab '1. Basic Information'
- (2) Click on '2) Members'
- (3) Click on '+ New Member'

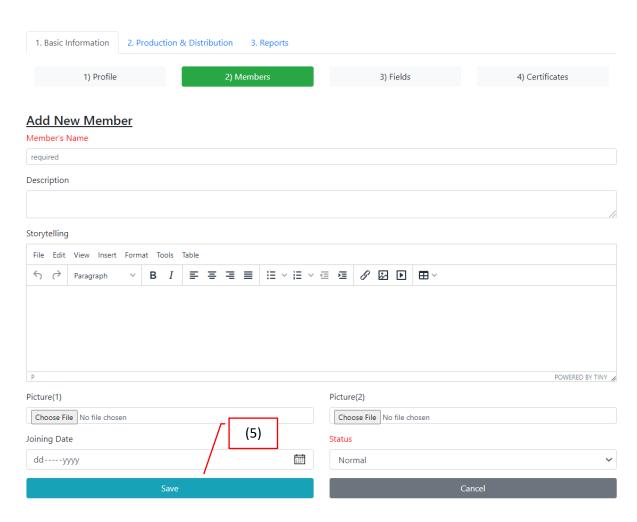


(4) Enter Member details

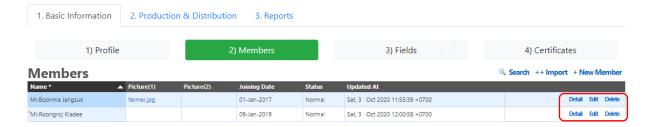
- Name
- Description/ Remark
- Storytelling. The user can add more details about the member. This
 information will be shown on the result page when customers scan QR
 code with the traceability system.
- Picture (Click 'Choose File' to upload file from the computer. The user can upload only 2 pictures)
- Joining Date
- Status (Select from the drop down; Normal/Suspend/Revoke)

(5) Click 'Save'





- (6) The system shows the table of member list. If the user wants to add more member, click '+New Member' again and repeat (4)-(5).
- (7) The user can update member data any time by clicking 'Edit' on the member's row.
- (8) Click 'Delete' if the user wants to remove the member out of the group.





(9) Click 'Detail' on any specific member will show detail of that member.

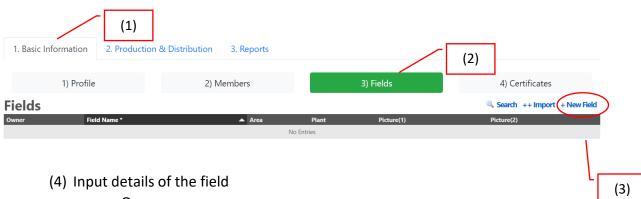


2.4. How to input 'Field'

'Field' data will be linked to the member in 2.3 in which one member can own more than one filed. It is obligation to link the farm to its owner whose membership has already been recorded.

How to input 'Field'

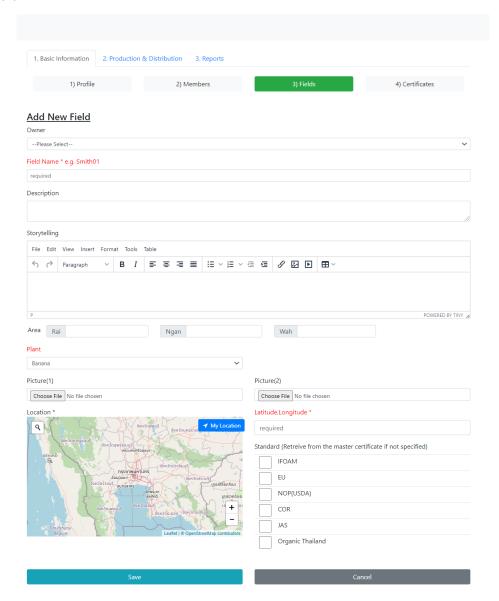
- (1) Click on '1. Basic Information'
- (2) Click on '3) Fields'
- (3) Click on '+ New Field'



- Owner
- Field Name
- Description/ Note
- Storytelling. This information will be shown on the result page when customers scan QR code with the traceability system.
- Area
- Plant
- Picture (Click 'Choose File' to upload file from the computer. The user can upload only 2 pictures)
- Location (Latitude, Longitude)



- Organic Standard (If not select, the system will use standard data that enter in Certificate Menu)
- (5) Click 'Save'

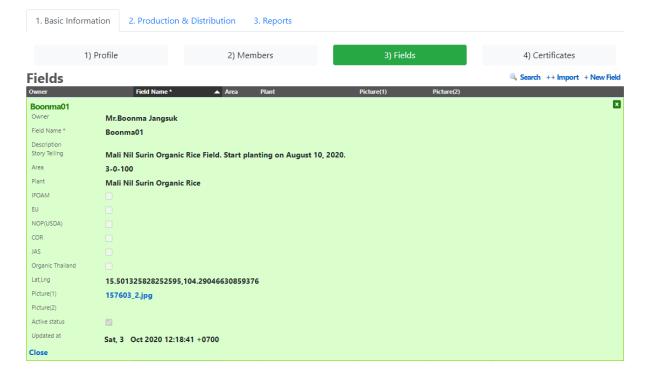


- (6) The system shows the farm list. The user can add more farm by clicking on '+ New field' and repeat step (4)-(5).
- (7) The user can update by 'Edit' on the specific field.
- (8) The field can be removed by 'Delete'.





(9) Click 'Detail' on any specific field will show detail of the field.





2.5. How to input 'Certificate'

The Certification Menu allows user to input 'Master Certificate' of the operator. This certificate certifies all plants grown by all members. The certificate ensures the consumer that all process is compiled to the organic standard or GI standard. Once the certificate data is input into the system, there will be three level of verification.

Level 1 Self verified by the user

Level 2 TraceThai admin verifies based on the public data shown by the certification body (CB). In case GI standard, admin will verify data from Department of Intellectual Property (DIP)'s database.

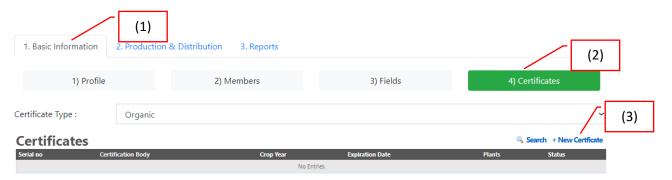
Level 3 CB or DIP who issues the certificate endorses the certificate through e-mail sent by the system.

GI Certificate is valid for two years. The master organic certificate lasts for one year. Therefore, the user needs to re-enter organic certificate data once a year. TraceThai platform will notify the user by e-mail 3 months before the current certificate expires. The user needs to contact CB to certify the coming crop before the current certificate expires.

2.5.1. Organic Standard

How to input 'Organic Certificate'

- (1) Click on '1. Basic Information'
- (2) Click on '4) Certificates'. The default page of Certificates menu will be organic standard.
- (3) Click on '+ New Certificate'



- (4) Input details of the organic certificate
 - Serial Number of Certificate
 - Certification Body (CB)
 - Crop Year
 - Upload certificate file (.jpg, .png, or .pdf)
 - Issuance Date/ Expiration Date
 - Plants certified by CB
 - Estimated Output
 - Standards i.e. IFOAM, EU/USDA/COR/JAS or Organic Thailand





(5) Click 'Save'

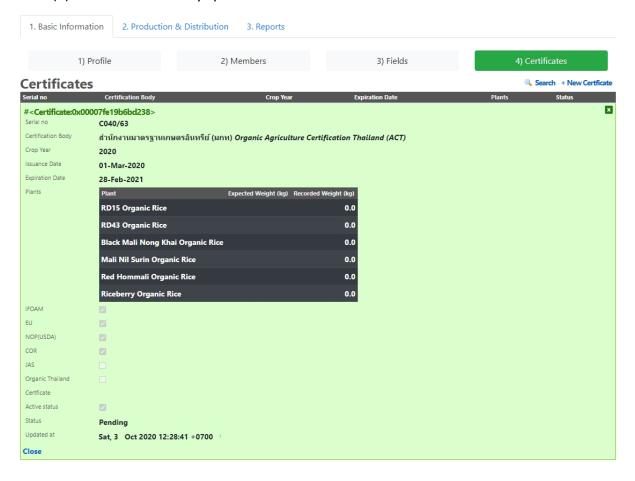
1) Profile	2) Members	3) Fields		
New Certificate				
No. *		Certification Body *		
ired	Organic Agriculture Certification Thailand (ACT)			
Year		Certificate File(Image or Pdf)		
	Choose File No file chosen	Choose File No file chosen		
nce Date *	Expiration Date *			
уууу	ddyyyy			
s *		Standards *		
Plant	Expected Weight (kg)	IFOAM		
Banana		EU		
RD15 Organic Rice		NOP(USDA)		
RD43 Organic Rice		COR		
Jasmine Organic Rice		JAS		
Chai Nat 1		Organic Thailand		
RD69 (Tubtim Chumphae) Organic Rice				
PinKaset Organic Rice				
Black Mali Nong Khai Organic Rice				
Mali Nil Surin Organic Rice				
Thai Pathumthani Fragrant Rice				
Hom Pathum Thep Organic Rice				
Red Hommali Organic Rice				
Khao' Jow Hawm Suphan Buri				
RD6 Glutinous Rice				
Riceberry Organic Rice				
Organic Black Bean				
Organic Tiger Peanut				
Organic Mung Bean				
Organic Soy Bean				
Mixed				
Spinach				
Pumpkin				



- (6) The system shows the certification list. The user can add more certificate by clicking on '+ New Certificate' and repeat step (4)-(5).
- (7) The user can 'Edit' the information in case errors happen as long as there is no verification by CB or TraceThai administrator. The certificate can be removed by clicking 'Delete'. Please note that once the certificate has been referred in any production or distribution, the user is not allowed to edit any data of the certificate. This is to guarantee the integrity of the system.



(8) Click 'Detail' on any specific certificate will show detail of the certificate.

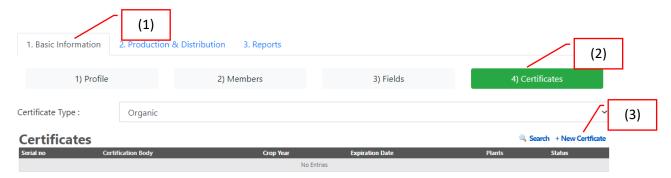




2.5.2. GI Standard

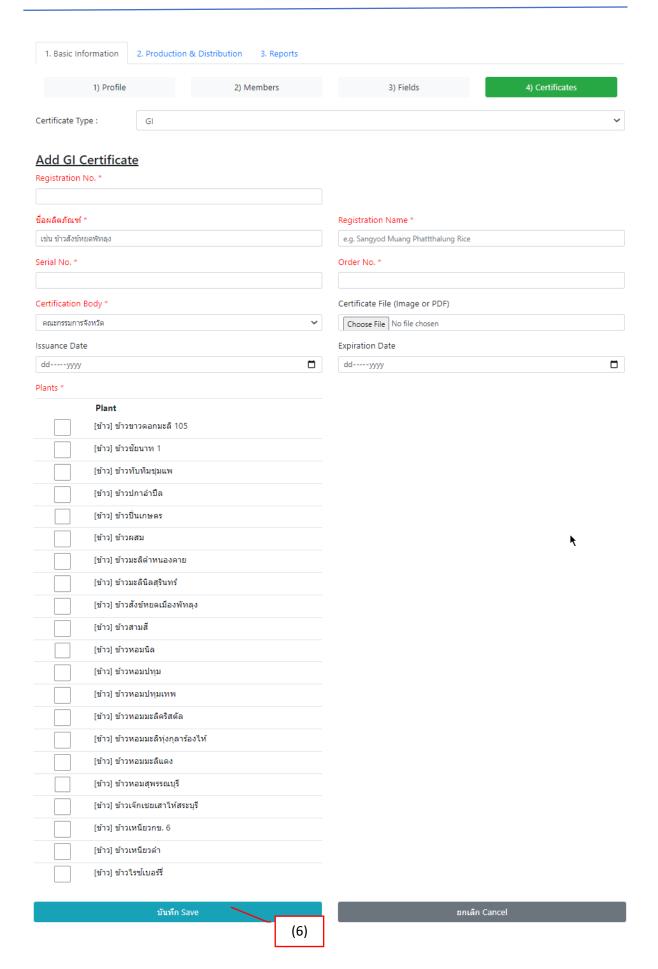
How to input 'GI Certificate'

- (1) Click on '1. Basic Information'
- (2) Click on '4) Certificates'.
- (3) Select 'GI' certificate type.
- (4) Click on '+ New Certificate'



- (5) Input details of the organic certificate
 - Registration Number
 - Registration Product Name (Thai/ English)
 - Serial No.
 - Order No.
 - Certification Body (CB)
 - Upload certificate file (.jpg, .png, or .pdf)
 - Issuance Date/ Expiration Date
 - Plants certified by CB
- (6) Click 'Save'





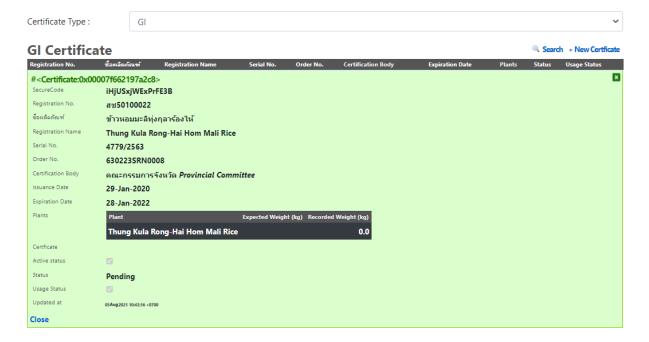
User's Manual: TraceThai.com



- (7) The system shows the GI certification list. The user can add more certificate by clicking on '+ New Certificate' and repeat step (5)-(6).
- (8) Like organic standard, the user can 'Edit' GI standard data in case errors happen as long as there is no verification by CB or TraceThai administrator. The certificate can be removed by clicking 'Delete'. Please note that once the certificate has been referred in any production or distribution, the user is not allowed to edit any data of the certificate. This is to guarantee the integrity of the system.



(9) Click 'Detail' on any specific certificate will show detail of the certificate.





2.6. How to input 'Raw Material'

Raw material in TraceThai platform can be anything depending on the production process. For example, the community enterprise who compiles materials or products from members. The raw material in this case might mean the paddy rice. If the user is packager, the raw material might be the rice to be packed for distribution.

There are two types of the raw material. First, the raw material from the internal process. Second, the raw material obtained from different user's account.

For the first type, the data entry process will be as follows:

- (1) Click on tab '2. Production and Distribution'
- (2) Click on '1) Raw Materials'
- (3) Click '+ New Material'



(4) Input raw material details

- Internal Lot Number
- Field that produces raw material
- Plant type (Default data was automatically extracted from the certificate
 that ties with this field, the user just selects the plant from the list.
 However, the user might select other plants out of the list in case that the
 plant declared earlier has been damaged and the producer switch to grow
 other plant without prior notice.)
- Receiving Date
- Expiration Date
- Format of the material such as paddy rice, rice, coarse rice, husked rice, rice bran.
- Packaging such as big bag, box, bag, casket
- Size (in Kilogram) per Package
- Number of Packages
- Total Weight (in Kilogram)

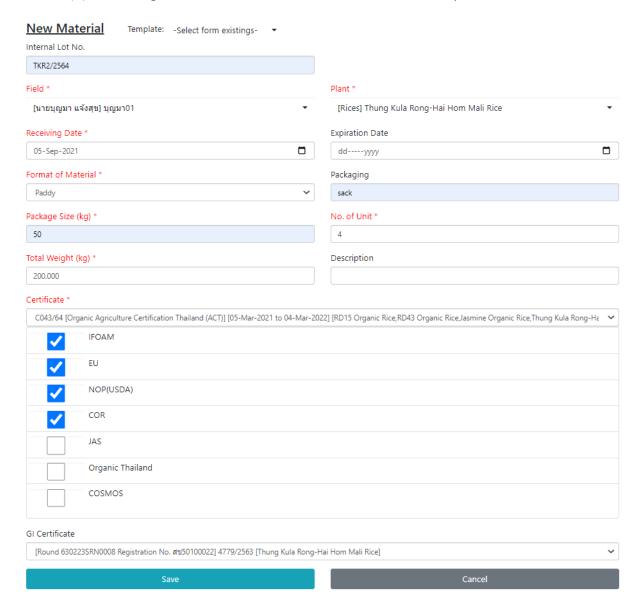
Please note that the last three input are related since

Total Weight = Number of Packages X Size per Packages.

Therefore, the user can input any two fields, and the rest shall be auto filled by the system.



(5) Select organic certificate and/ or GI certificate from drop-down menu.



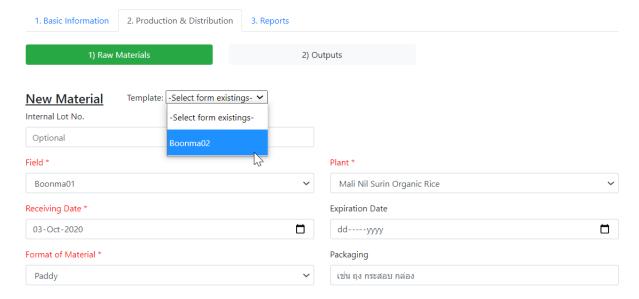
- (6) Click 'Save'
- (7) Once the input is complete, the system presents the list of raw material as follows:
 - Lot Number is auto generated to be used for traceability
 - Internal Lot Number for internal reference
 - Receiving Date
 - Source (There are two types; 'Self-Produced' means the data is entered by the user, 'Obtained' means the raw material has been distributed to the user from other users in TraceThai platform.
 - Plant Type
 - Total Weight (in Kgs.)
 - Number of Units



- Outstanding Units (If the raw material has already been used up, the number will be zero).
- Production Lot Number (refer to the production lot number that has used this raw material).
- Certificate. The user can click 'View' to see the master organic certificate.
- GI. By clicking 'View', GI certificate will be shown.

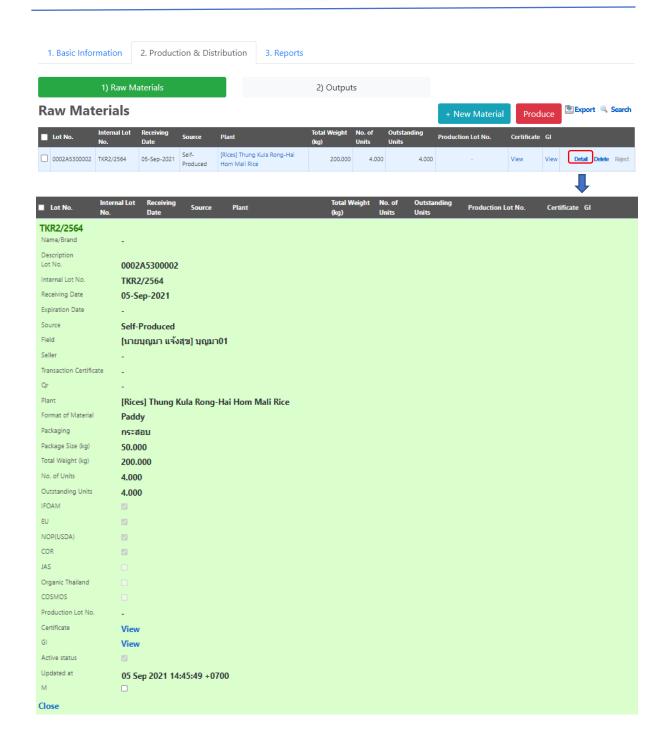


(8) The user can click '+ New Material' to add more input and repeat process (4) to (5). The system will support the user by building the template to reduce time to input the data and make it convenient for the user to re-enter data.



- (9) The pop-up window will appear for the user to confirm.
- (10) The system will extract stored data filtered by user-chosen template. The user just only edits the data that changes from previous record such as receiving date, expiration date, total unit, etc.
- (11) The system will not allow the user to edit the record that is already stored on blockchain. If there is any error during data entry, the user needs to delete the whole record and begin from '+New Material.'
- (12) The user can click 'Detail' to see all the data or click 'delete' to erase the record.





Note

In case that the user cannot add more data after recording the raw material, the error might come from various reasons. First, total weight of raw material is greater than the total weight specified in the certificate. Second, the receiving date of the raw material is later than the expiration date of related certificate. The system shall notify the user by the red tab on the screen.



2.7. How to input 'Production'

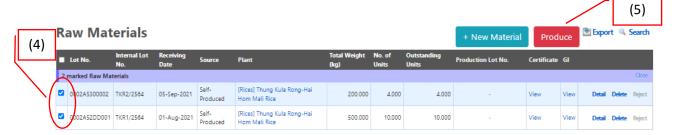
Any production process shall begin from obtaining raw material and then produce. This section will elaborate how to turn raw material into output.

How to input 'Production'

- (1) Click on '2. Production and Distribution'
- (2) Click on '1) Raw Materials'
- (3) The system shows the list of all materials available for production. The data include those that has been recorded by the user and those sent from other users in TraceThai platform. These two types can be differentiated by looking at column 'Source'.



- (4) The user selects raw materials from the list by checking the boxes in front of the material.
- (5) Then click 'Produce'.

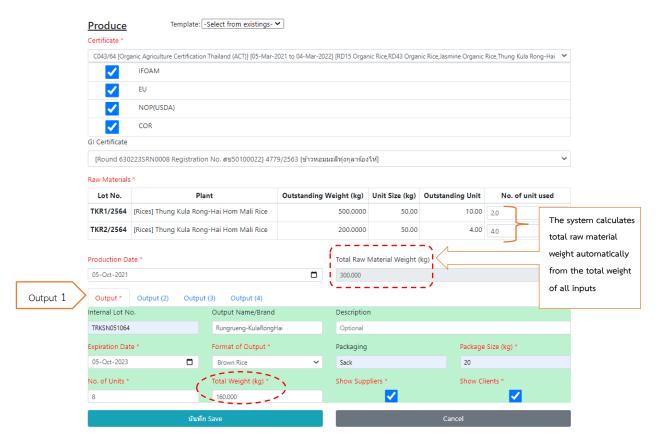


(6) Input the production details

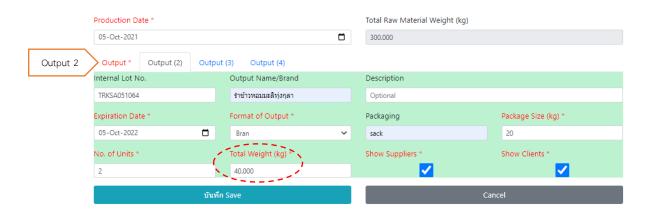
- Select organic certificate and/ or GI certificate.
- Raw Material (The system will present the selected material from previous step so the user can input the number of units that has been used in the current production. The default number is the outstanding number of units in the system. The system recognizes weights involved and it will automatically update weights of all material in each production.)
- Production Date
- Total Weight of Raw Material (This is auto calculated from the system so the user can verify the number before proceeding to the next step.)



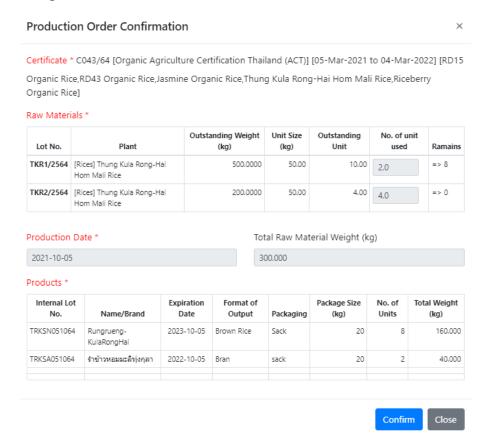
- Outputs. Each output requires data on:
 - Internal Lot Number
 - Output Name or Brand Name
 - Description
 - Expiration Date
 - o Format of output such as coarse rice, husked rice, etc.
 - Packaging such as big bag, box, bag, casket
 - Size (in Kilogram) per Package
 - Number of Packages
 - Total Weight (in Kilogram) Show Suppliers/ Show Clients. The user can choose whether to present the 'source of raw material' or 'the customer' data in the traceability platform. If the user unchecks any box of the data item, the information of that item will not be presented to the consumers when they scan the QR code.
- (7) In some case, there might be multiple types of output. For example, the milling of paddy rice will yield rice, rice bran, and rice hull. The system allows the user to define up to four distinctive outputs in one production. The user can input data by clicking on tab 'Output (2)' 'Output (3)' and 'Output (4)', respectively.







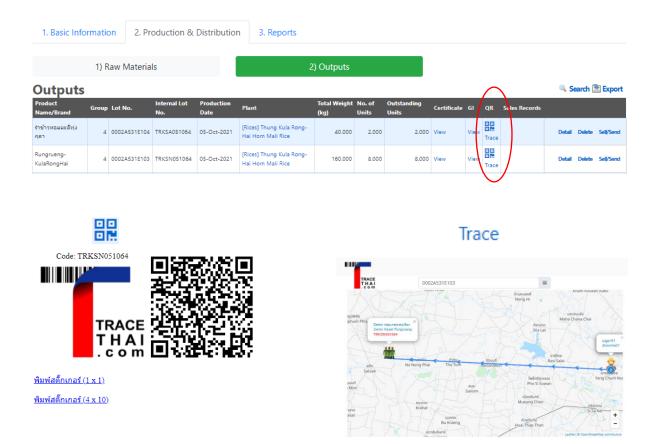
- (8) Click 'Save'
- (9) The system shows summary data. The user verifies production details and click 'Confirm'. If there is any mistake, click 'Close' and edit data. Then click 'Save' again.



- (10) The data recorded in this process will be presents as a list on '2) Output'
 - Product Name/ Brand
 - Group of outputs came from the same production.
 - Lot Number for the current production that has been auto generated by the system.
 - Production Date
 - Plant Type



- Total Weight (in Kgs.) of output
- Unit Number
- Outstanding Units (Inventory)
- Certificate (Clicking on 'View' will see the master certificate)
- GI (Clicking on 'View' will see the GI certificate)
- QR consists of QR Code and 'Trace'. The user can click on the QR code icon to get the template of QR Code ready for label printing by printer. If the user clicks 'Trace', the system will show the path of production on the map similar to what the consumers shall see when they scan QR Code.
- Sales Records show reference code when that product was sent to others.



(11) In case that there is any error in data input, the user must remove that output item by clicking 'Delete' before the system allows the user to re-enter.

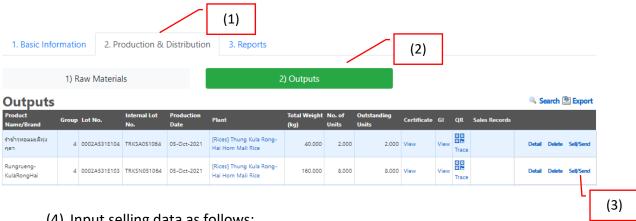


2.8. How to input 'Distribution'

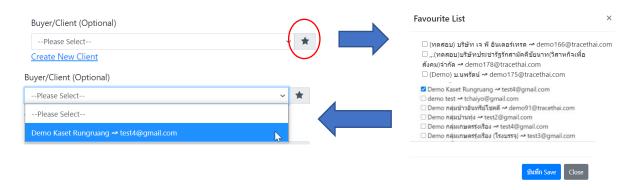
When the user sells or forwards output to other account, the user must enter data by clicking 'Distribution.' This data will be recorded in blockchain network. The data edit is prohibitive. After the buyer record this transaction, the buyer shall see the output of seller as 'raw material' in the system. In short, the buyer in TraceThai can skip the data entry of raw material if he purchases from another user in the system.

How to input 'Distribution'

- (1) Click on Tab '2. Production & Distribution'
- (2) Click on '2) Outputs'
- (3) The list shows all output that has been produced in previous process. The user checks the box of the item he wants to sell and click 'Sell/ Send' at the end of the row.

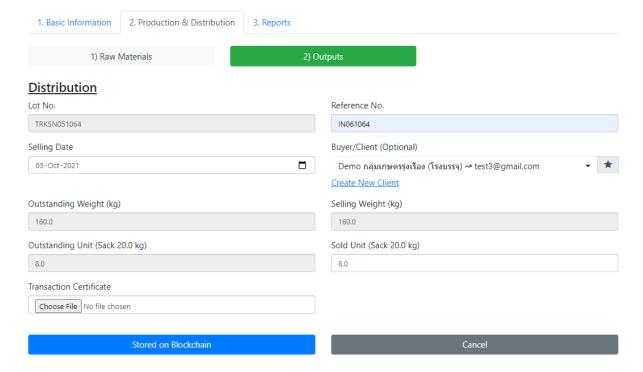


- (4) Input selling data as follows:
 - Lot Number
 - Reference Number (This means the number of any trade document related to this transaction such as Purchasing Order Number or Bill of Lading Number)
 - **Selling Date**
 - Sell To (Name of the customer that the user can select from the list. The user can create the shortcut by selecting several customers from the drop-down list and create the favorite list. To relieve the burden of the seller, he might not need to input detail of the retail transaction.)





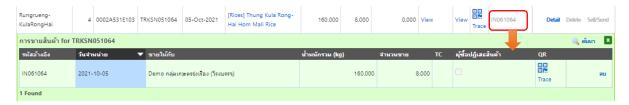
- Outstanding Weight
- Selling Weight
- Outstanding Units
- Selling Units
- Upload Transaction Certificate (Optional)



- (5) Click 'Stored on Blockchain'
- (6) The system will auto-generate the reference number in the sell history.



(7) If the user clicks on this reference number, the detail of the transaction will be shown.





2.9. How to Reject Output

As mentioned in previous section, the output of other users will be recognized and automatically appeared as raw material in the buyer's window. It is possible that the buyer might find that the physical output delivered do not meet the requirement as being agreed upon. The seller can reject the output physically by returning the output to the buyer. In addition, the seller needs to update the system by clicking 'Reject' in this menu. The transaction data on blockchain cannot be edited but the new record will be created on blockchain to create trail that the previous record has been revoked and all outputs are returned to the buyer.



On the seller side, the seller will be notified in 'Sales Records' and the reference number is in red. This signals that the output has been delivered but rejected by the buyer.



If the seller clicks on 'Sales Records', the system shows detail of the transaction in which there appears the checked box on 'Rejected by Buyer'. The seller can remove this transaction by clicking 'Delete' at the end of the row. The returned output shall be reverted to the seller inventory waiting to be resold or inspected.

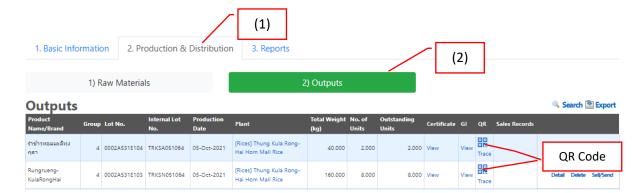




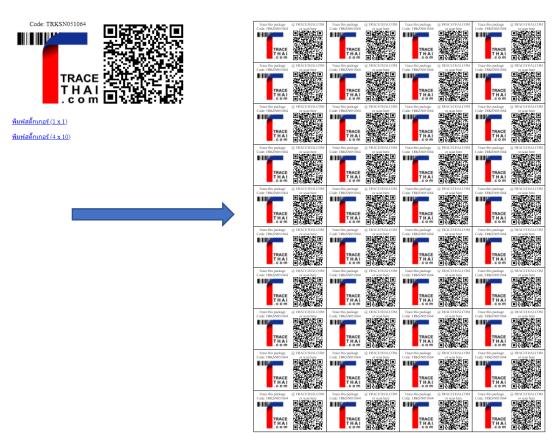
2.10. How to access QR Code

The user can access to the QR Code in order to print the label from the 'Output' menu.

- (1) Click on '2. Production & Distribution'
- (2) Click on '2) Outputs'
- (3) Click on the QR code icon of the designated production record.



(4) The system will show the QR Code of that production lot such that the user can save the picture from the screen or directly print the label. Please note that TraceThai platform prepares the label sticker based on A4 size sticker.



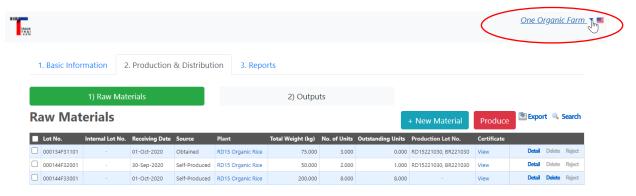


2.11. How to create new profile

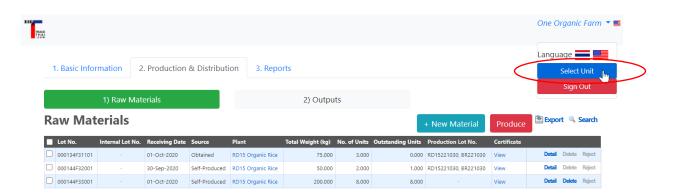
Each user can create multiple profiles for convenient management. In case of the operator wants to record information of each production unit seperately, such as rice milling, packaging. Each production unit can show a separate seach location. For example, the operator create 2 profiles, the first one is a rice mill that receives paddy from farmers, The second is a packing house that receive rice from the mill profile and prepare the product for retail sales. When consumer search in the traceablility sytem, the result will be displayed from the mill profile sent to the packing house profile.

How to create new profile

1) Click on "Account Name" in the top right corner of the screen.

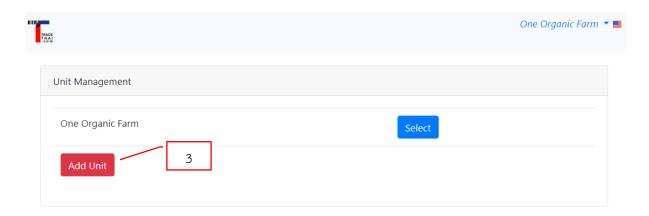


2) The system will show a sub-menu to select, click on "Select Unit"

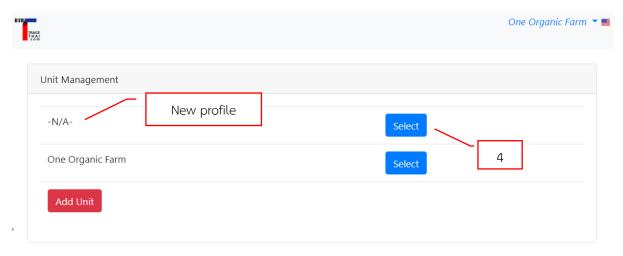




3) Click on "Add new unit"

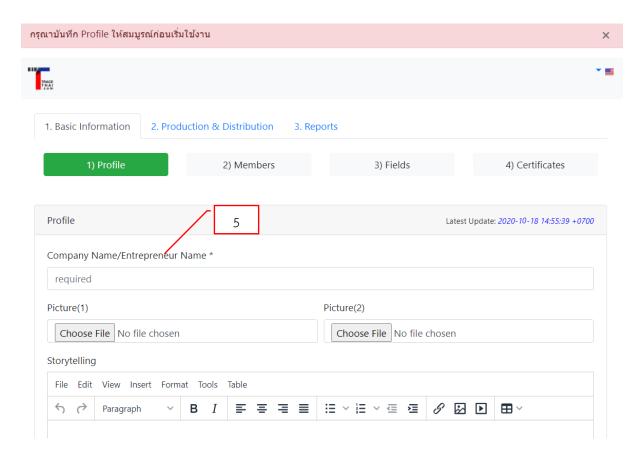


4) The system will create new production unit profile. All menu and usage is the same as the previous unit. The user need to name the new profile by clicking on "Select" to enter the profile name first.

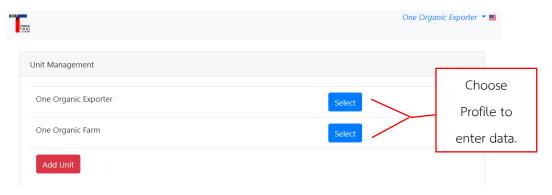


5) On the general informagion page, the user enter new profile name in the field "Company Name/ Employer Neme"





6) When the user click on "Select Unit" the next time, there will be new profile for the user to enter information.



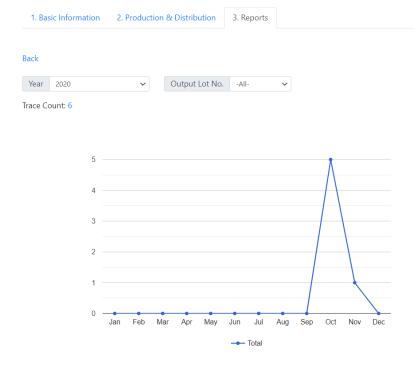


2.12. Report

The user can monitor how the user scan QR code for marketing intelligence or spot the irregularities in the market. The user clicks on 'Reports' and then click 'QR Code Scanning Records.'



The platform allows the user to select the period to view the result.



The system shows how many times each lot number has been scanned, where (inferred from IP Address), and when.

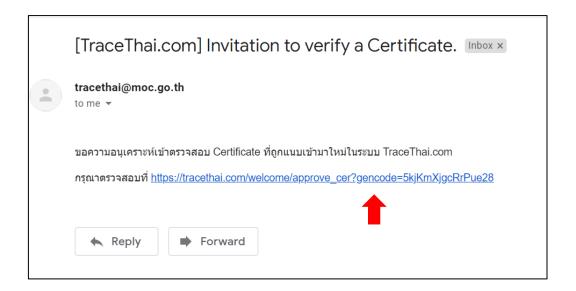
Trace Histories [2020]

ID	Lot No.	IP Address	Location	Date
1771	0002A4F35101	66.249.79.230	Ashburn,US 20149	16-Nov-2020
1611	0002A4F35101	171.98.69.146	Bangkok,TH 10100	31-Oct-2020
1610	0002A4F35101	171.98.69.146	Bangkok,TH 10100	31-Oct-2020
1609	0002A4F35101	171.98.69.146	Bangkok,TH 10100	31-Oct-2020
1608	0002A4F35102	171.98.69.146	Bangkok,TH 10100	31-Oct-2020
1607	0002A4F35102	171.98.69.146	Bangkok,TH 10100	31-Oct-2020

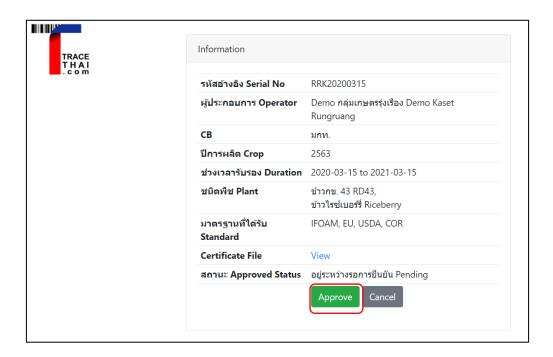


3. How to Endorse the Certificate

The Certifying Body (CB) plays an important role in verifying the validity of the certificate uploaded by the operators. Once the operator records the certificate with issuing CB, TraceThai will notify CB by e-mail. The CB needs not to enter the platform. The CB can endorse or cancel the certificate by clicking link embedded in the e-mail.

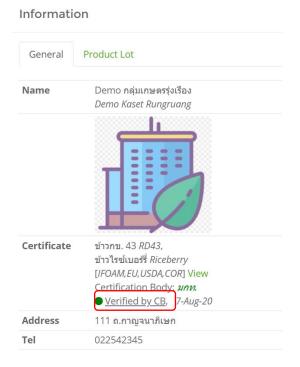


This link will lead the CB to TraceThai.com and show the details of the certificate claimed by the operator. The CB can either endorse the certificate by clicking 'Approve'.





Once the CB approves the certificate, the information shown in the traceability will show 'Confirmed by CB' and the dark green icon.



In case that TraceThai verifies the certificate based on public data available on the internet, the system will show 'Verified by Link' and the user can click the link that lead to the source of the proof.



Certificateข้าวกข. 43 RD43 Organic Rice,ข้าวทับทิมชุมแพ RD69 (Tubtim Chumphae) Organic Rice,ข้าวมะลิติกหนองคาย Black Mali Nong Khai Organic Rice,ข้าวมะลินิลสุรินทร์ Mali Nil Surin Organic Rice,ข้าวหอมปทุมเทพ Hom Pathum Thep Organic Rice,ข้าวหอมมะลิแดง Red Hommali Organic Rice,ข้าวไรซ์เบอร์รี่ Riceberry Organic Rice[IFOAM,EU,USDA, COR] ViewCertification Body: สำนักงานมาตรฐานเกษตรอินทรีย์ (มกท) OrganicAgriculture Certification Thailand (ACT)Confirmed by Link, 05-Oct-20



4. Traceability for the Consumer

The consumer can trace where the food comes from by using the smart phone to scan the QR code on the produce. Alternatively, the consumer can access TraceThai.com and enter Lot Number to trace the origin of the product. The data stored on Blockchain will be displayed on the map which allows the consumer to trail where the product passed.



The consumer can seek more information on the producer by clicking on the icon. Related information such as details of operator, certificate can be accessed by clicking on related icons.

