Vegetable Grafting Decision Support Tool User Manual http://graftingtool.ifas.ufl.edu/

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1 Introduction

Grafting is a promising horticultural technique for commercial vegetable production because it can provide vegetable growers a sustainable and eco-friendly practice to manage plant diseases, boost plant nutrient and water absorption, and increase fruit quality. In addition to resources for adopting the grafting practice in the farm, producers need information on how grafting practices affect cost and revenue to make decisions to adopt the technology. Given the volatile yield of grafting plants and unknown grafted transplant prices, producers need to be able to evaluate trade-offs associated with grafting practice, expected yield, and net returns.

Vegetable Grafting Decision Support Tool is developed to allow producers, extension agents, and researchers to compare user-specific production conditions for growing vegetables using grafting and nongrafting practices. The user may specify:

- State to indicate where the farms/experimental stations are located.
- Crop name to indicate the crops by specifying crop name, of interests.
- Scion to indicate the scion used for grafting.
- Rootstock to indicate the scion used for grafting.
- **Crop type** to indicate whether the crop the production is organic or conventional, and the names of scion and rootstock of expected grafting transplants.
- **Production systems** to indicate whether the production system is an open field, or high tunnel, or greenhouse production system.tunnels, or greenhouses are used.
- Other farm characteristics such as the location of the farm, the production season, and farm size.
- **Production season** to indicate when the crop is grown.

With the production conditions that users define, the tool provides users with information on the economic conditions (e.g., revenue, cost, net income) of an average vegetable farm with a similar production condition. It allows users to conduct a side-by-side comparison of economic conditions between vegetable farms that use grafting and the ones do not use grafting. There are three main types of economic analysis:

- **Partial Budget Analysis**: It compares details that contribute to added or reduced costs and net returns between non-grafting and grafting practices.
- Sensitivity Analysis: It demonstrates the change in the net returns of non-grafting and grafting practices under various production scenarios and determines the importance of the changing factor that affect the net return.
- Break-Even Analysis: It calculates the threshold of a factor when non-grafting and grafting practices generate the same net returns.

Besides, the tool allows users to modify the budget sheet and conduct three types of aforementioned economic analysis using values fitting user-specific vegetable farm conditions. Last but not least, the tool aims to deliver the most recent grafting-related research results to vegetable producers. It allows researchers on vegetable grafting to upload the most recent research results to the database on which producers rely to conduct the economic analysis.

This tool is a product of a university, USDA and industry team funded in part by Award #2016-51181-25404 of the USDA Specialty Crops Research Initiative titled "Growing new roots: Grafting to enhance resiliency in U.S. vegetable industries."

1.1 Use Caveats

The default values used in the analysis are based on experimental observations and from existing literature. Changes in parameter values and their implications on net returns are estimates. Users should use their own reasonable judgment to determine whether the direction and magnitudes of economic indicators are appropriate before making and decision on their production practices based on the results from the tool.

As such, this tool is provided 'as is' and without warranties as to performance or merchantability. Any statements made by the tool do not constitute warranties and shall not be relied on by the user in deciding whether to use the tool or act on its results. This tool is provided without any expressed or implied warranties whatsoever. The user assumes the entire risk of using the tool. The University of Florida will not be liable for any claim or damage brought against the user by any third party, nor will the University of Florida be liable for any consequential, indirect, or special damages suffered by the user as a result of the software.

2 Access to the Decision Support Tool

The Vegetable Grafting Decision Support Tool is developed using Python Django Web framework. It is a free and open-source Python Web framework provided by the Django Software Foundation.

To access the tool, users may need Internet access and a web browser (Common web browsers are Firefox, Chrome, or IE). The decision support tool can be used by typing the URL address http://graftingtool.ifas. ufl.edu/ in the web browser address bar.

We strongly recommend users use a desktop or laptop to access the tool. Using a tablet or phone may miss some functions.

3 Home Page

Upon visiting the tool's URL address, users are immediately directed to the homepage of the tool. The homepage of the tool provides an overview of the tool and a role selection section to allow users to select a role best describes themselves in order to access the unique functions that are designed for the role.

3.1 "Select Your Role" Section

At the top of the homepage, users are asked to choose a role better describes themselves (Figure 1). By selecting a role, users are directed to a new web page to access their account (For details, please read Section 4) and use functions that are specifically developed for the selected role.

The functions for different roles are:

• Vegetable Producer:

- Conduct economic analysis (For details, please read Section 5 and Section 6)
- Researcher:
 - Conduct economic analysis (For details, please read Section 5 and Section 6)
 - Report new experiment results (For details, please read Section 9)
- Extension Agent:
 - Conduct economic analysis (For details, please read Section $\frac{5}{5}$ and Section $\frac{6}{5}$)
 - Report new experiment results (For details, please read Section 9)

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This decision support tool allows the user to evaluate the economic returns of adopting grafted vegetable production. It integrates partial budget comparison analysis, sensitivity analysis, and break-even analysis to help the user understand the economic benefits of adopting vegetable grafting technology and thereby make informed management decisions for improvement.



To Get Started, Please Select Your Role

Figure 1: The **"Role Selection"** section on the homepage

3.2 "About" Section

Below the role-selection section of the homepage, users see a section "About" (Figure 2). In this section, users can read a brief introduction of the tool.



Figure 2: The **"About"** section on the homepage

In the section, users can also read a brief introduction of different types of economic analysis by clicking the button for that type of economic analysis.

For example, if users are interested in learning what the **sensitivity analysis** is, they may click the **"Sensitivity Analysis"** button. The button calls up another screen to provide a **brief introduction of sensitivity analysis** (Figure 3). When users finish read the introduction, they may go back to the home page by clicking the **"Close Window"** button.



Figure 3: A brief introduction of sensitivity analysis page

3.3 "Contact Us" Section

At the bottom of the home page of the tool, Users can get access to the contact information of developers of the tool (Figure 4). They may reach out to the development team for any feedback, question, and suggestion by sending an email.



- Yefan Nian: yfnian@ufl.edu
- Dr. Zhifeng Gao: zfgao@ufl.edu
- Dr. Xin Zhao: zxin@ufl.edu

Figure 4: The **"Contact Us"** section on the homepage

4 Account Management

The tool allows users to create an account using their email address. Creating an account is optional for **vegetable producers** who use the tool, but we strongly recommend you do so, please read Section 4.1 for the benefit of creating an account. If you do not wish to create an account but still conduct economic analysis, please click the "**Continue As A Guest**" button(Figure: 5) at any account management web pages.



Figure 5: The **"Continue As A Guest"** button

However, the tool requires **researchers** and **extension agents** who use the tool to create an account. The reason the tool requires **researchers** and **extension agents** to create an account is that it allows the tool administration team to verify the experiment results that researchers and extension agent report are authentic, on which would be relied to conduct economic analysis (For details of report economic result, please read Section 9).

If users wish to learn more about different types of users of the tool (vegetable producer, researcher, and extension agent), please read Section 3.1.

4.1 The Benefit of Registering an Account

Although creating an account is not required, a **vegetable producer** who uses the tool is strongly recommended to create an account. The benefits of creating an account are listed in the following section.

4.1.1 Save Economic Analysis Results and View Economic Analysis History

Creating an account allows the tool to store users' analysis history in the database. Users may view their historical economic analysis results anytime once they login to their account.

For details, please read Section 8.

4.1.2 Receive Updates of Grafting Research

The other benefit of creating an account is to allow users to join our email list to receive any news or updates of vegetable grafting research.

To join the email list, users may

- First, click their "User Name" at the top-right corner of web pages once they login to the account.
- Then, select Account from the drop-down list
- Next, click Email Newsletter on the new page
- Finally, check the box at the new page and click the **Save** button

An example can be found in Figure 6.

GRFATING DECISION SUPPORT TOOL	🖀 Home	Contact Us	rt New Analysis				User Name	
•	Input			Step 1	: Sele	ct "Account"	© Account	
	Step 1: Please pro	vide your production informatio	n				 Analysis History Logout 	
Home	Contact Us	C ^{al} Start New Analysis					User Name	
Account								
Support		Account Detail	s F	references		History		
About		Update Details		Email Newsletter		Analysis Histor	/	
Contact		Change Password	Step 2: Cl	ick "Email Newsl	etter"			
			-					
A Home	Contact Us	C ^I Start New Analysis		Step 4: The su	ccessf	ul message is	User Name	
Your ema	ail preferences have b	een updated. Thank you.						
Update Email Preferences								
Would you like to receive Email about vegetable grafting news and research updates from us?								
	Star 2: Check the here							
			Save			and click "S	ave" button	

Figure 6: Join the Email newsletter email list group

To stop receiving the Email newsletter, users may follow the previous steps but uncheck the box and then click the **Save** button at the last step.

4.2 Account Registration

Registering an account at the tool requires three steps.

• First, users may click the **Create an Account** on the bottom of the login page once users select their role on the homepage of the tool. After clicking **Create an Account**, users are directed to a registration page.

An example can be found in Figure 7

	Welcome!
	Email Address: Your Email Address Password: Your Password
P.C.	Login
	Conitinue As A Guest
Click "Cre	Forgot Password? create an Account!

Figure 7: An example of access to registering an account page

- Second, users may fill the fields of the registration form and click "**Register Account**". The required information is:
 - Full Name: Users' user-name.
 - Email Address: Users' email address. This is the information used for authentication of the account (such as login to your account or reset password) and contacted by the tool development team. This information CANNOT BE CHANGED, please provide users' primary email address.
 - Password: Users' password of the account. A valid password requires
 - * can't be too similar to your other personal information.
 - $\ast\,$ must contain at least 8 characters.
 - * can't be too similar to your other personal information.
 - * can't be a commonly used password.
 - * can't be entirely numeric.

The password can be reset anytime. For instruction, please read Section 4.5. If users forget the password, they may reset a new password following Section 4.4.

An example of a registration form can be found in Figure 8.

	Create an Account! Step 1: Fill in the fields
	Full name:
In 1941 TANK	Your Full Name
1 A Star As a Caracter	Email:
CONTRACT INFORMATION	Your Email
	Password:
	Your Password
	Password confirmation:
	Your Password
	 Your password can't be too similar to your other personal information. Your password must contain at least 8 characters. Your password can't be too similar to your other personal information. Your password can't be a commonly used password. Your password can't be entirely numeric.
	Step 2: Click "Register Account" button
	Register Account
	Conitinue as a guest

Figure 8: Registering an account page

• After submitting the registration form, users may receive an email in their registered Email address. Users may open their email and click the link in the email to activate the account. An example can be found in Figure 9

Hello,

Please activate your account for User's email address by clicking the link below:

http://graftingtool.ifas.ufl.edu/account/email/confirm/du4e9d254pnc9z84q7nc20ior449jmi5s4mp36yzsmjf/

Once you activate, you can login!

Click the link

Thank you,

Vegetable Grafting Decision Support Tool Team



Once users follow all the steps, users' accounts are successfully created and they may use their email address and password to login to the account.

If users are creating accounts as a **vegetable grafting researcher** or **extension agent** (For details, please read Section 3.1), please follow the above steps. The vegetable grafting decision support team will manually verify your information and change your account type as a **vegetable grafting researcher** or **extension agent** in 24 hours.

4.3 Account Login

Once users choose the role that best describes themselves (For details, please read Section 3.1), they are directed to the account login page.

To login in the account, users may provide - Account Email address - Account password Then users may click the "Login" button to login in the account (Figure 10)

Welcome! Step 1: Fill in the fields
Email Address: Your Email Address Password: Your Password
Login Step 2: Click "Login" button Continue As A Guest
Forgot Password? Create an Account!

Figure 10: Login account page

If users would like to create an account, please read Section 4.2. If users forget the password and wish to reset the password for the account, please read Section 4.4.

4.4 Forget Password

When users forget the password, they may reset their password using their email address associated with the account.

To reset the password, users may follow the following steps:

• Click the **"Forgot Password** at the account login page (Figure 11).

	Welcome!
	Email Address: Your Email Address Password: Your Password
	Login
	Conitinue As A Guest
Click "F	Create an Account

Figure 11: Access to forget password page

• Users will be directed to the reset password page. At this page, users may provide their **Email address** associated with the account and then click the **"Reset Password"** button (Figure 12).

Home Contact Us C Start New	r Analysis	+3 Login
Step 1: Provide email ad-	Reset your Password	
	Reset Password	Step 2: Click "Reset Password button

Figure 12: Forget password email address page

- A password reset email with a unique link will be sent to the email address provided if the email address exists in our account database.
- Users may open their email and click the link to go to the password reset page (Figure 13).

Hello <mark>User Name</mark>
We have received an request to reset your password for Grafting Decision Support Tool. Please reset your password for Grafting Decision support Tool (127.0.0.1:8000) for User Name by clicking the following link:
https://u14297690.ct.sendgrid.net/ls/click?upn=xdmy4NTg0F9M-
2FsbpUJYLFfUZjlqDacVnhpoW3hmIBGa5gNgrwbUJSQj0wP5v17vwbeiG5Wacqig1IKIJoR2zSiZXAaEGsm31K5DGpVTUyQ2kPGtPmanOdNk
o333H-2F9tojXvk_ZjRbPGitQlkKpFauEBtn-2FaUsP0bkYJvD93N-
2BCnJU3gErruRk2vLPVvkoMxQ2MJwGhUPLHL1keVUcMQ696ubYWApn03zDsSxmz-2BB-
2FrvNLsxXT8bkX3BiYU9q0iZ5eRX6IVn3mjBra4rDBHEw6M5VghgxBxNkhgTJPsYKECIpwUV6h4TFKm508-
2FN1J2AEUD83Aa6PnSLEjKjgiX-2FPK0Ed3To4TfBbDyjET0xQ60T7h1uQ-3D
Thank you,
Vegetable Grafting Decision Support Tool Team

Figure 13: Forget password email

• Users may reset the password by filling the fields and click "Reset password" button (Figure 14).

Home Contact Us C Start New	v Analysis	+ジ Login
	Set your Password New password: • Your password can't be too similar to your other personal information. • Your password must contain at least 8 characters. • Your password can't be a commonly used password. • Your password can't be entirely numeric.	Step 1: Fill in the fields
	Set new password	Step 2: Click "Set new password" button

Figure 14: Reset password when forgetting the password

4.5 Reset Password

Users may reset password anytime when login to the account. To be able to do so, users may

- Visit the Change your password page (Figure 15)
 - First, click their "User Name" at the top-right corner of web pages once they login to the account.
 - Then, select **Account** from the drop-down list

GRFATING DECISION SUPPORT TOOL	😤 Home	Contact Us	C ^I Start New Analysis			User Name
<	Input			S	tep 1: Select "Account	22 OS Account
<u> </u>	Step 1: Please provid	e your production in	aformation			🗠 Analysis History
	Step 1. Please provid	e your production i	Tormation	_		(+ Logout
				Ļ		
A Home	Contact Us	C ^a Start New	v Analysis			User Name
Account						
Support		Account [Details	Preferences	History	
About		Update Det	ails	Email Newsletter	Analysis His	tory
Contact		Change Pas	ssword Step 2	2: Click "Change Pa	ssword"	

Figure 15: Access to reset password page

• Reset the password by filling the fields and click "Reset password" button (Figure 16).

Home Contact Us	w Analysis	+3 Login
	Set your Password New password: • Your password can't be too similar to your other personal information. • Your password must contain at least 8 characters. • Your password can't be a commonly used password. • Your password can't be entirely numeric. New password confirmation:	Step 1: Fill in the fields
	Set new password	Step 2: Click "Set new password" button

Figure 16: Reset password

5 Economic Analysis Input Page

After selecting the role best describes themselves (For details, please read Section 3.1) and choosing to use the tool as a guest or registered account user (For details, please read Section 4), users may start to conduct economic analysis using the tool.

5.1 Start a New Analysis Session

To start a new economic analysis session, users may click the "Start New Analysis" button at the start new analysis page (Figure 17). After clicking the button, users are directed to the next page to input their farm information.



Figure 17: start a new analysis page

Users may visit this page anytime to start a new economic analysis by clicking the "Start New Analysis" button, which is located at the top of each web page (Figure 18).

GRFA DECI: SUPPOR	ATING ISION RT TOOL	Home Contact Us C ^{II} Start New Analysis	User Name	
Input Start New Analysis		"Start New Analysis" button	© Account	
Ŭ		Chan 1: Plance provide your production information		
		Step 1: Please provide your production information	🕪 Logout	



Before users start to conduct economic analysis, it is strongly recommended to read this user manual because it may provide valuable information to users on how to conduct analysis and interpret the economic analysis results.

5.2 Define Experiment Search Condition

After users click the "Start New Analysis" button at the start new analysis page (for details, please read Section 5.1), users are directed to the input page. The purpose of the page is to allow users to enter their vegetable production conditions so that they could use the experiment data that are similar to their production conditions to conduct the economic analysis. Users may fill in the fields by selecting an option from the drop-down list and click the "Search" button to search the experiment data that are similar to their search conditions (Figure 19). The drop-down list is activated by clicking once with the left mouse button on the field. The fields that users need to fill in are:

• Your State: (Not Required)

The first input field is the location of the vegetable farm. It allows users to specify which of the state the farm is located. The answer for the field allows the tool to search the experiment data that is close to or in the state that users specify. If users are not interested in the performance of vegetable grafting technology in a particular state, they may leave this field empty.

• Your Crop Name: (Required)

This field asks users to choose a crop name that they intend to use to conduct economic analysis from the drop-down list. To be able to continue on economic analysis, Users must fill in this field.

• Your Scion: (Dependent on "Your Crop Name" field and Not Required)

This field asks users to choose a scion that they intend to use under the grafting production condition. Since the choice of the scion is associated with the crop, the drop-down list is activated after users make a choice of the crop name. Otherwise, none of the options is shown in the drop-down list. If users are not interested in a specific scion, they may leave this field empty.

• Your Rootstock: (Dependent on "Your Scion" field and Not Required)

This field asks users to choose a rootstock they intend to use under the grafting production condition. Since the choice of the rootstock is associated with the scion, the drop-down list is activated after users make a choice of the scion. Otherwise, none of the options is shown in the drop-down list. If users are not interested in a specific rootstock, they may leave this field empty.

• Your Crop Type: (Not Required)

This field asks users to choose a crop type they intend to plant. The options are "conventional" or "organic". Since various crop types may be associated with the crop selling price and production cost, providing this information may improve the accuracy of economic analysis. It is strongly recommended to provide the information. If users are not interested in a particular crop type, they may leave this field empty.

• Your Production System: (Not Required)

This field asks users to choose a production system on which they intend to operate their vegetable farm. The options are "open field", "high tunnel", and "greenhouse". Since the volatile performance of grafting technology and the cost of production across various production systems, providing this information may improve the accuracy of economic analysis. It is strongly recommended to provide the information. If users are not interested in a particular production system, they may leave this field empty.

• Your Production Season: (Not Required)

This filed asks users to choose a production season. The options are "Spring", "Summer", and "Fall". Since the crop selling price may vary from seasons, providing this information may improve the accuracy of economic analysis. It is strongly recommended to provide the information. If users are not interested in a particular production season, they may leave this field empty.

GRFATING DECISION SUPPORT TOOL	👫 Home 💩 Contact Us C ^{at} Start New Analysis 🧮 Adding Experiment Result	User Name
	Input	
	Step 1: Please provide your production information Step 1: Fill in fields	
	* marked field: Your State	are required
		~
	Your Crop Name *	
	Please select a crop name from the list to continute	
	Your Scion Your Rootstock	
	·····································	~
	Your Crop Type	~
	Your Production System Your Production Season	
	· · · · · · · · · · · · · · · · · · ·	~
	Step 2: Click "Search" button	rch →

Figure 19: Input farm production conditions

5.3 Select Experiment Result

After users click the "Search" button, the tool provides a list of experiment result data that users can include in their economic analysis. If users intend to include the experiment result in the economic analysis, they may "Check" the box located at the most right column of the table showing experiment results. Users may include as many experiment results as they want. After users finish their choice, they may click the "Submit" button to confirm their choice and be directed to the farm size input page (Figure 20).

Ste	p 2: Please choose exp	periment results	s you want to include	in the economic analysis						
We	ofound following	experiments	; that are same a	s or similar to your prod	duction condition.					
lf n sel	io results match your production conditions, we will display the results that are most close to your search. If you are not satisfied with the results listed below, please make new ections									
Ple	ase:									
•	Choose the exper	riment result	s that you want t	o include in the economi	ic analysis from the follow	ving table and then	click Submit			
•	Click Submit, we	will conduct	the economic ana	alysis using the average	value of the all experimer	t results in the tab	Step 1:	"Check	" the box t	o include
#	State	Сгор	Сгор Туре	Production System	Production Season	Scion	the expe	eriment	result in a	nalysis
1	North Carolina	Tomato	Conventional	Open Field	Fall	Mountain Fresh				
2	North Carolina	Tomato	Conventional	Open Field	Fall	Mountain Fresh	801	2010	Details	
3	North Carolina	Tomato	Conventional	Open Field	Fall	Mountain Fresh	802	2010	Details	
	Clear Step 2: Click "Submit" button to confirm the choice									

Figure 20: Choose experiment result to be included in the economic analysis

If users do not include any experiment result in Figure 20 and click the **"Submit"** button, the tool includes all experiment results from the list to the economic analysis and directs users to the farm size input page.

If users want to remove one experiment result they previously have chosen from the economic analysis, they may "**Un-check**" the box located at the most right column of the table showing experiment results (Figure 21).

Ste	p 2: Please choose ex	periment result	s you want to include	in the economic analysis						
W	e found following	experiments	s that are same a	s or similar to your pro	duction condition.					
lf r sel	to results match your production conditions, we will display the results that are most close to your search. If you are not satisfied with the results listed below, please make new ections									
Ple	ase:									
or •	Choose the expe	riment result	ts that you want t	to include in the econom alysis using the average	ic analysis from the follov value of the all experimer	ving table and then on the tab	Step 1: exclude t analysis	"Unc the ex	heck"t perimer	he box t 1t result i
*	State	Crop	Crop Type	Production System	Production Season	Scion				
4	North Carolina	Tomato	Conventional	Open Field	Fall	Mountain Fresh	Mountain Fresh	2010		
1	North Carolina						noundantricar	2010	Details	
2	North Carolina	Tomato	Conventional	Open Field	Fall	Mountain Fresh	801	2010	Details	
2	North Carolina	Tomato Tomato	Conventional Conventional	Open Field Open Field	Fall Fall	Mountain Fresh Mountain Fresh	801	2010	Details Details Details	
2	North Carolina	Tomato Tomato	Conventional	Open Field Open Field	Fall	Mountain Fresh Mountain Fresh	801	2010	Details	
2	North Carolina North Carolina	Tomato	Conventional	Open Field Open Field	Fail Fail Clear	Mountain Fresh Mountain Fresh	801	2010	Details Details	
3	North Carolina North Carolina	Tomato	Conventional	Open Field Open Field	Fail Fail Clear	Mountain Fresh Mountain Fresh	801	2010	Details Details	

Figure 21: Remove an experiment result to be included in the economic analysis

If uses want to remove all experiment results they previously have chosen from the economic analysis and make a choice again, they may click the "Clear" button (Figure 22).

Ste	ep 2: Please choose exp	periment result	s you want to include	in the economic analysis							
W	We found following experiments that are same as or similar to your production condition.										
lf r sel	no results match your production conditions, we will display the results that are most close to your search. If you are not satisfied with the results listed below, please make new elections										
Ple	ease:										
•	Choose the expe	riment result	<mark>ts t</mark> hat you want t	o include in the economi	ic analysis from the follov	ving table and then c	ick Submit				
or •	Click Submit, we	will conduct	the economic ana	alysis using the average	value of the all experimer	nt results in the table					
	State	Crop	Crop Type	Production System	Production Season	Scion	Rootstock	Year	Experiment Information	Choose	
1	North Carolina	Tomato	Conventional	Open Field	Fall	Mountain Fresh	Mountain Fresh	2010	Details		
2	North Carolina	Tomato	Conventional	Open Field	Fall	Mountain Fresh	801	2010	Details		
3	North Carolina	Tomato	Conventional	Open Field	Fall	Mountain Fresh	802	2010	Details		
	Clear Click "Clear" button to remove all experiment result from the economic analysis										

Figure 22: Remove all experiment results to be included in the economic analysis

5.4 Input Farm Size

Once users finish choosing experiment results to be included in the economic analysis, the tool asks users to provide their farm size information. The default value is 1 acre. If users want to make a change, they may directly type the farm size in the field and click the "Analyze" button (Figure 23).

۲	GRFATING DECISION SUPPORT TOOL	Home Contact Us C ^d Start New Analysis Adding Experiment Result	Luser Name
		Input	
		Step 3: Please provide your farm size Step 1: Input farm size	
		Your Farm Size 1.00	Acres
		Step 2: Click "Analyze" buttor	Analyze →



6 Economic Analysis Results

Once users the **"Analyze"** button after specifying the farm size, they are directed to the economic analysis results pages. In a typical economic analysis result page, it has the following sections (Figure 29):

• Economic analysis name section: In this section, users may find the name of economic analysis. If users would like to learn more about the meaning of the analysis, they may click the question mark next to the name of the analysis. For example, if users are interested in learning the meaning of partial budget comparison analysis, they may click the question mark next to the **Comparison Analysis** (Figure 24).



Figure 24: An example of the help button for the partial comparison budget analysis

A pop-up window will be shown the explanation of the partial budget analysis and the instruction on how to interpret the results (An example can be found in Figure 25)

Comparison analysis ×
The partial budget comparison Analysis compares details that contribute to the added or reduced costs and returns between the production systems that use grafted versus non-grafted transplants.
We provide three types of comparison analysis:
1. Net Return Comparison Analysis
It compares net return between grafting and non-grafting production systems
2. Total Revenue Comparison Analysis
It compares total revenue between grafting and non-grafting production systems
3. Cost Comparison Analysis
It compares the cost between grafting and non-grafting production systems in different production stages.
Close the Window

Figure 25: An example of the help page for the partial comparison budget analysis

- **Results navigation section**: In this section, users may go see different economic analysis results by clicking various buttons.
- Economic analysis results section: In this section, users may find the details of the the economic analysis results. For details of different types of economic analysis, please read Section 6.1, Section 6.2, and Section 6.3.
- Farm information section: In this section, users may find information on their farm information. It shows the production conditions that users specify at the input page (please read Section 5 for how to specify production conditions)

Also, the tool allows users to conduct the economic analysis that is specific for users' own farm by modifying the budget sheet. To modifying the budget sheet, users may click the "Customize Budget Sheet" button located at the bottom of the section (Figure 26). For details of customizing the budget sheet, please read Section 7.



Figure 26: **"Customize Budget Sheet"** button

• Experiment result data section: In this section, users may find the experiment data that are included to conduct the current economic analysis.For details on how to select experiment data and include them in the economic analysis, please read Section 5.3 User may check out the detail information of experiment data by clicking " Experiment Details" button in the table (Figure 27).



Figure 27: **"Experiment Details"** button

Users may see a pop-up window to explain the details of experiment (Figure 28)

Experiment Information ×									
Article Title	On-farm Grafted Tomato Trial to Manage Bacterial Wilt								
Author(s)	David H Suchoff, Frank J. Louws, Christopher C. Gunter, Jonathan R. Schultheis, and Randall Patterson								
Journal Name	ISHS Acta Horticulturae 1086: I International Symposium on Vegetable Grafting								
Publish Year	2015								
Link	Link								
	Close the Window								

Figure 28: An example of experiment details page

GREATING DECISION SUPPORT TOOL	Home Contact Us	C ^e Start New Analysis	Adding Experiment R	esuit					LUSer Name
BLOGET SHEETS	Sensitivity Analysis 😮 🛽	Economic	analysis n	ame sectio	n 🛛	Beck			Next O
ECONOMIC ANALYSIS	Different Crop Selling Price Scen	arios \$	Different Transpla	ant Price Scenarios	\$ Dif	ferent Yield Scenarios	Results na	avigation sect	ion
In: Break-Even Analysis	Sensitivity Analysis Chart Different Cro	op Selling Price Scenarios	onomic	analveie r	esult sect	ion	Farm Information (Your search production condi	itions)	
	\$54,139	LA		anary 515 1	esun seci		S	earch Information	
Ŭ	\$43,312						Item	Farm Information	
	E \$32,484						State	South Carolina	~
	2 s21,656 s10,828						Crop Name	Tomato	~
	50						Farm Size	1.00	Acres
	\$0.351b	\$0.42/b	Crop	so.solib Selling Price	\$0.60/lb	\$0.72/b	Scion Name	Mountain Fresh	~
			Non-Grafting Net Return	Grafting Net Return			Rootstock Name	801	~
							Crop Type	Conventional	~
	Sensititivity Analysis Table						Production System	Open Field	~
	Crop Selling Price (\$/lb)	0.35	0.42	0.50	0.60	0.72	Production Season	Fall	~
	Nongrafting Net Return (\$)	18237.39	22703.53	28062.90	34494.14	42211.63	Farm inf	ormation section	n –
	Grafting Net Return (\$)	23491.88	29201.19	36052.36	44273.77	54139.46	Item	Experiment Result	
							Nongrafting Yield	64312.41	b
							Grafting Yield	82214.09	ь
								Customize Budget She	et
	Note								
	The analysis results are based on the follow	ving experiment	Experim	ent result	data sect	tion			
	I State Crop	Cron Type Rrodu	ction System Prod	uction Season Season	cion Reotet	ock Year Experimen	nt Information Nongrafting tra	nsplant density Grafting trans	plant density
	1 North Carolina Tomato	Conventional O	pen Field	Fall Mount	ain Fresh Mountain	Fresh 2010	etails 5800.00) ea/acre 5800.00	ea/acre

Figure 29: An example of the analysis result page

There are three major types of economic analysis are conducted by the tool:

- Comparison analysis
- Sensitivity analysis
- Break-even analysis

The details on what each type of analysis means, why the tool conducts each of them, and how to interpret the analysis results are discussed in the following sections.

6.1 Comparison Analysis Results

Comparison analysis is a useful analytical method that compares details that contribute to added or reduced costs and returns between production scenarios. In the case of adopting grafting technology, the added expenses of grafted transplants are considered as the adverse effects, whereas the potential added crop yield and gross returns of associated the grafting production scenario are the positive effects. This analysis provides information on whether the increased marketable fruit yield can offset the additional costs associated with the grafting production scenario.

When users view the comparison analysis results, there are three charts of analysis results. In each graph, there are two bars. The blue bar represents the non-grafting production scenario, while the organ bar represents the grafting production scenario. The three charts are:

• Net Return Comparison Chart: This chart compares the net return between two different production scenarios. When users move the mouse to point the bar, it shows the net return under various production scenarios.

For example, in Figure 30, it shows the net return under the non-grafting production scenario is \$28,062.90, while the net return under the grafting production scenario is \$36,052.36.



Figure 30: An example of the comparison analysis for net return under non-grafting and grafting production scenarios

• **Revenue Comparison Chart:** This chart compares the revenue between two different production scenarios. When users move the mouse to point the bar, it shows the revenue under various production scenarios.

For example, in Figure 31, it shows the revenue under the non-grafting production scenario is \$32,156.20, while the revenue under the grafting production scenario is \$41,107.04.



Figure 31: An example of the comparison analysis for revenue under non-grafting and grafting production scenarios

• **Cost Comparison Chart:** This chart compares the cost between two different production scenarios at various production stages. When users move the mouse to point the bar, it shows the specific cost under various production scenarios.

For example, in Figure 32, it shows the cost under the non-grafting production scenario at harvesting stage is \$3,022.68, while the cost under the grafting production scenario at harvesting stage is \$3,864.06.



Figure 32: An example of the comparison analysis for production cost at various production stage under non-grafting and grafting production scenarios

6.2 Sensitivity Analysis Results

Sensitivity analysis is an economic analysis that calculates how net return changes under various scenarios in correspondence to a factor. It shows the relative importance of the investigated factors and is increasingly used in the agricultural and environmental science fields for decision making at a local scale.

The tool conducts sensitivity analysis to reveal how vegetable farmers' net return changes under the nongrafting and the grafting production scenarios corresponding to a factor change, such as grafted transplant price change. Three types of sensitivity analyses are conducted in the tool.

6.2.1 Different Crop Selling Price Scenarios¹

In this type of sensitivity analysis, the tool analyzes how the net return responds to the change of crop selling price under non-grafting and grafting production scenarios.

The bar graph shows the net return of the farm may receive in different crop price selling levels under various production conditions (non-grafting versus grafting production conditions) on average. When users move the mouse to point the bar, it shows the net return under the specific scenario.

For example, in Figure 33, it shows that when the crop selling price is \$0.35/ea, the net return under the non-grafting production scenario is \$18,237.39, while the net return under the grafting production scenario is \$23,491.88.

 $^{^{1}}$ In this analysis, the tool assumes users will receive the same crop selling price (grafted crop selling price) either under grafting or no-grafting production scenarios



Figure 33: An example of the sensitivity analysis for various crop selling price scenarios

6.2.2 Different Transplant Price Scenarios

In this type of sensitivity analysis, the tool analyzes how the net return responds to the change of grafted transplant price under non-grafting and grafting production scenarios.

The bar graph shows the net return of the farm may receive in different grafted transplant price levels under various production conditions (non-grafting versus grafting production conditions) on average. When users move the mouse to point the bar, it shows the net return under the specific scenario.

For example, in Figure 34, it shows that when the grafted transplant price is \$0.35/ea, the net return under the non-grafting production scenario is \$28,062.90, while the net return under the grafting production scenario is \$35,991.25.



Figure 34: An example of the sensitivity analysis for various grafted transplant price scenarios

6.2.3 Different Yield Scenarios

In this type of sensitivity analysis, the tool analyzes how the net return responds to the change of grafted yield under non-grafting and grafting production scenarios.

The bar graph shows the net return of the farm may receive in different grafted yield levels under various production conditions (non-grafting versus grafting production conditions) on average. When users move the mouse to point the bar, it shows the net return under the specific scenario.

For example, in Figure 35, it shows that when the grafted yield is x% of non-grafted yield, the net return under the non-grafting production scenario is \$28,062.90, while the net return under the grafting production scenario is \$23,492.88.



Figure 35: An example of the sensitivity analysis for various grafted yield scenarios

6.3 Break-Even Analysis Results

Break-even analysis is an analysis that calculates the threshold of a factor (e.g., transplant price) when two production scenarios generate the same net return.

The tool conducts break-even analysis to reveal the threshold of a factor (e.g., grafted transplant price) associated with grafting production scenario which enables the grafting production scenario to generate the same net return as the non-grafting production scenario. Two types of break-even analysis are conducted in the tool.

6.3.1 Willingness To Pay (WTP) for Transplant in Various Crop Selling Price Scenarios²

In this type of break-even analysis, the tool calculates the maximum amount of money the vegetable growers should pay for grafted transplants to make the grafting production practice generates the same net return as the non-grafting production practice under various crop selling price scenarios.

The line graph shows the maximum amount of money vegetable growers should pay for grafted transplants under various crop selling price scenarios.

For example, in Figure 36, it shows that if the crop selling price is \$0.35/lb, vegetable producers' net return under the grafting production scenario is the same as the non-grafting production scenario when they pay \$12.13/ea for grafted transplant price.

 $^{^{2}}$ In this analysis, the tool assumes users will receive the same crop selling price (grafted crop selling price) either under grafting or no-grafting production scenarios



Figure 36: An example of the break-even analysis for grafted transplant price under various crop selling price scenarios

6.3.2 Expected Yield in Various Crop Selling Price Scenarios³

In this type of break-even analysis, the tool calculates how much yield of the vegetable farm should have using the grafting production practice so that it generates the same net return as the non-grafting production practice under various crop selling price scenarios.

The line graph shows the yield of the vegetable farm should have for grafting production practice under various crop selling price scenarios.

For example, in Figure 37, it shows that if the crop selling price is \$0.35/lb, vegetable producers' net return under the grafting production scenario is the same as the non-grafting production scenario when grafting production's yield is 103.27% of non-grafting production's yield.

 $^{^{3}}$ In this analysis, the tool assumes users will receive the same crop selling price (grafted crop selling price) either under grafting or no-grafting production scenarios



Figure 37: An example of the break-even analysis for grafting production yield under various crop selling price scenarios

7 Customize the Budget Sheet

The tool allows users to conduct the economic analysis that is specific for users' own farm by modifying the budget sheet. To modifying the budget sheet, users may - First, click the "Customize Budget Sheet" button located at the bottom of the section (Figure 38) of economic analysis results pages.



Figure 38: **"Customize Budget Sheet"** button

• Second, click the name of the budget sheet to navigate to the budget sheet corresponding to the production stage that users would like to modify (Figure 39).

	d Hank @ Colo	dite C Band In	Adding Dynamical No. 1	Click the	budget she	et name to na	vigate to th	e correct	budget	Lus France				
Detailed Resignt Dawle	Budget Sneet Lietails Pre-Planting Budget Sheet			Producing Budget Sheet		Harvesting Budge	et Sheet	8	Post-Harvesting Budget Sheet					
In Senatticity Analysis 3	for herk													
li. Beat-Dee Andysia 🔿	Engly Dent - Per Mindry Roye													
•	1. Contraction (1997)		Non-Grafting				Grating							
	hem	Unit	Price	Amount Per Acre	Total Amount	Cost	Price	Amount Per Acre	Total Amount	Cest				
	Tanglart	-	\$ 0.20	400.00	400.00	\$ 8000	\$ 050	40000	400.00	s 200.00				
	Fertilizer	h	5 0.50	458.00	458.00	s 229.00	5 050	458.00	458.00	s 229:00				
	Hebide	h	5 0.00	0.00	0.00	5 0.00	5 000	0.00	0.00	5 0.00				
	Furrigation	PT	5 947	100	100	5 9.87	5 947	1.00	1.00	5 947				
	Labor	Hur	5 900	3.00	200	5 27.00	5 900	3.00	3.00	5 27.00				
	Offeer Cost	NA	5 0.00	1.00	1.00	5 0.00	5 000	1.00	1.00	5 0.00				
	NA	NA	\$ 0.00	0.00	0.00	\$ 0.00	5 0.00	0.00	0.00	\$ 0.00				
	NA	NA	\$ 0.00	0.00	0.00	s 0.00	5 0.00	0.00	0.00	5 0.00				
	NA	NA	\$ 0.00	0.00	0.00	s 0.00	5 0.00	0.00	0.00	5 0.00				
	NA	NA	s on		0.00	5 000	(s) em		000	5 000				
	NA	NA	\$ 0.00	000	0.00	\$ 0.00	5 0.00	0.00	0.00	5 0.00				
	Total					5 3637				5 465.87				
										Cubmit Dra. Display Stans Budget Chast				
										Second to the second stage budget sheet				

Figure 39: Navigation to the budget sheet that users would like to modify

• Third, modify the budget sheet. Once users finished modifying, click the **"Submit"** button for the budget sheet that users just modified (Figure 40).

		ff Hame 🖄 Contact U	e C Berthe	Adding Department Press							🔒 Uher Name
Butter Second	Bu	idget Sheet Detai	ls								
ECONOMIC ANALYSIS	Pr	Pre-Planting Budget Sheet		1	Producing Budget Sheet		Harvesting Budge	rt Sheet		Post-Harvesting Budget Sheet	
In Senattivity Analysis 3							Go back				
is man-transmission - 2	-	udget Sheet Pre-Planting Stage									
•		r -		Non-Grafting				Grating			
		hem	Unit	Price	Amount Per Acre	Total Amount	Cost	Price	Amount Per Acre	Total Amount	Cent
		Tanglet	-	\$ 0.20	400.00	400.00	5 8000	\$ 0.50	400.00	400.00	5 20000
	1	Fertilizer	ь	\$ 0.50	458.00	458.00	5 229.00	\$ 0.50	456.00	458.00	5 229:00
	ŀ	Herbilde	ь	\$ 0.00	0.00	0.00	5 0.00	\$ 0.00	0.00	0.00	5 0.00
		Runigation	ল	\$ 9.87	100	100	5 9.87	\$ 9.87	1.00	100	5 9.87
		Labor	Hur	\$ 9.00	200	2.00	s 27.00	\$ 9.00	2.00	2.00	s 27.00
		Other Cost	NA	\$ 0.00	100	100	5 0.00	5 0.00	1.00	100	5 000
		NA	NA	5 0.00	0.00	0.00	5 0.00	5 0.00	0.00	0.00	5 0.00
		NA	NA	\$ 0.00	0.00	0.00	5 0.00	5 0.00	0.00	0.00	5 0.00
		NA	NA	5 0.00	0.00	600	5 000	5 0.00	0.00	0.00	5 000
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		Total					5 345.87				5 485.97
	Ľ							Step 2: cli	ck "Submi	t" button	Submit Pre-Planting Stage Budget Sheet

Figure 40: Modify the budget sheet

• Lastly, once users finish all modifications, click the **"Go Back"** button to view new economic analysis results at experiment results pages (Figure 41).

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DUDGET SHEETS	Budget Sheet Det	tails mt		Producing Budget Shee	t	Harvesting Budg	et Sheet		Post-Harvesting Budget Sheet				
🗉 Companies - Analysis													
In Senatticity Analysis - 9		6 mai											
li. Beal-Deer Analysis	Budget Sheet Pre-Planting S	ltage		Click "Go]	Back" butto	n to go back e	economic ai	ialysis res	ults pages —				
•	1		Non-Grafting				Gratting		· · ·				
	hem	Unit	Price	Amount Per Acre	Total Amount	Cest	Price	Amount Per Acre	Total Amount	Cent			
	Tanplart	-	5 0.20	400.00	400.00	\$ 8000	\$ 0.50	40000	40000	s 200.00			
	Fertilzer	ь	5 0.50	458.00	458.00	5 229:00	5 0.50	458.00	458.00	5 229.00			
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	Funipation	ল	1 9.07	100	1.00	5 9.07	5 9.07	1.00	100	5 947			
	Labor	Hur	1 900	200	2.00	\$ 27.00	1 900	2.00	3.00	5 27.00			
					100				1.00	(a) (and			
	Unit Cost	~	1 June	100	100	5 900	5 W		1.00	5 000			
	NA	NA	\$ 0.00	0.00	0.00	\$ 0.00	\$ 0.00	0.00	0.00	5 0.00			
	NA	NA	\$ 0.00	0.00	0.00	s 0.00	5 0.00	0.00	0.00	\$ 0.00			
	NA	NA	\$ 0.00	0.00	0.00	s 0.00	5 000	0.00	0.00	S 0.00			
	NA	NA	\$ 0.00	0.00	0.00	\$ 0.00	s 0.00	0.00	0.00	s 0.00			
	NA	NA	\$ 0.00	0.00	0.00	s 0.00	\$ 0.00	0.00	0.00	5 0.00			
	Total					5 3637				5 485.37			
	L												
										Submit Pre-Planting Stage Budget Sheet			

Figure 41: **"Go Back"** button in budget sheet page

8 Manage Economic Analysis History

One advantage of creating an account in the tool is to allow users to manage their economic analysis history (Figure 42). They may save the economic analysis results and view those results later when they login to the account (For other benefits of creating an account in the tool, please read Section 4.1).

8.1 Save Economic Analysis Result

Once logged-in users finish viewing economic analysis results, they are directed to a new web page. In the web page, users are asked whether they would like to save the analysis results for later viewing.

- If users would like to save the economic analysis results, they need to click the **"Save the Result** button.
- If users would not like to save the analysis results and conduct the economic analysis again, they need to click the **Restart Analysis** button.



Figure 42: Save economic analysis page

8.2 View Economic Analysis History

To access the history of saved analysis results, Users may first click their "User Name" at the top-right corner of web pages once they login to the account, then select "Analysis History" from the drop-down

list (Figure 43).

GRFATING DECISION SUPPORT TOOL	Home Contact Us C ^{al} Start New Analysis	User Name
<	Input	00 Account
Ŭ	Select "Analy	sis History" 🗵 Analysis History
	Step 1: Please provide your production information	60 Logout

Figure 43: Access to economic analysis history

Alternatively, Users may access the economic analysis history by first click their "User Name" at the top-right corner of web pages once they login to the account. Then click "Account" from the drop-down list. Finally, Select "Analysis History in the new web page (Figure 44).

GRFATING DECISION SUPPORT TOOL	Home	Contact Us	C ^{II} Start New Analysis			User Name
<	Input			Step	1: Select "Account"	©© Account
	Sten 1: Please provi	de your production	information			🗠 Analysis History
		ae your production	internation			B Logout
				Ļ		
A Home	Contact Us	C ^I Start Ne	w Analysis			User Name
Account						
Support		Account	Details	Preferences	History	
About		Update De	tails	Email Newsletter	Analysis History	·
Contact		Change Pa	ssword	Ste	p 2: Click "Analysis	History"

Figure 44: An alternative way to access to economic analysis history

Once users choose "Analysis History, they will be directed to a new web page, which provides a summary of economic analysis history for the user (Figure 45).

*	Home	Contact Us	Start New Analysis						Luser Name
Ana	lysis Histor	Y							
=	State	Crop	Сгор Туре	Production System	Production Season	Scion	Rootstock	Analysis Time	Action
1	New York	Eggplant	None	None	None	None	None	July 6, 2020, 4:36 p.m. EST	View
2	Kentucky	Watermelon	Conventional	Open Field	Fall	Sugar Baby	Macis	July 6, 2020, 4:41 p.m. EST	View
3	Kentucky	Watermelon	Conventional	Open Field	Fall	Sugar Baby	Macis	July 6, 2020, 4:41 p.m. EST	View
4	Kentucky	Watermelon	Conventional	Open Field	Fall	Sugar Baby	Macis	July 6, 2020, 4:41 p.m. EST	View
UF									
Site Feedba	She Feedback (© 2020) Negratale Grating Decision Support Tool University of Florida, Institute of Food and Agricultural Sciences								
2550 Hull P	2550 Hull Road, PO Bax 115000, Gameenile R. 22611-0000 (1952-382-36311/Analytics; Dospit-Prince; Disability Services; Disability S								
Last Modifie	ant Modified Mox (\$Ju) 2020 EST								

Figure 45: An example of economic analysis history page

To view the details of one economic analysis history, users may click the "View" button (Figure 46), which located at the most right column of economic analysis history table.



Figure 46: **"View"** button at economic analysis history page

After clicking the "View" button, users are directed to a new web page to read the details of historical analysis results (Figure 47).

C Harre Constant		Luer Name
Analysis History Detail		
	Go Beck	
Your Farr	n Information	
Fem Information		
Search	Information	
Ren	Ferm Information	
State	Kentudy	~
Crop Name	Watermelon	~
Form Size	1.00	Aces
Scion Neme	Sugar Beby	~
Rootstock Name	Medis	v
Crop Type	Conventional	~
Production System	Open Field	~
Production Season	Fal	~
Exper	ment Result	
Nanprafting Yield	4854133	b
Grafting Yield	62969.33	
Comparis	on Analysis 😢	
Net Return Comparison Chart		

Figure 47: An example of the economic analysis history detail page

If users would like to learn more about the meaning of the analysis, they may click the question mark next to the name of the analysis. For example, if users are interested in learning the meaning of partial budget comparison analysis, they may click the question mark next to the **Comparison Analysis** (Figure 48).



Figure 48: An example of the help button for the partial comparison budget analysis

A pop-up window will be shown the explanation of the partial budget analysis and the instruction on how to interpret the results (An example can be found in Figure 49)

Close the Window
It compares the cost between grafting and non-grafting production systems in different production stages.
3. Cost Comparison Analysis
It compares total revenue between grafting and non-grafting production systems
2. Total Revenue Comparison Analysis
It compares net return between grafting and non-grafting production systems
1. Net Return Comparison Analysis
We provide three types of comparison analysis:
The partial budget comparison Analysis compares details that contribute to the added or reduced costs and returns between the production systems that use grafted versus non-grafted transplants.
Comparison analysis ×

Figure 49: An example of the help page for the partial comparison budget analysis

When users finish viewing the details of the economic analysis results, they may go back the summary of economic analysis history page (Figure 45) by clicking the "Go Back" at the top of the page (Figure 50)

Go Back

Figure 50: The **"Go Back"** button at economic analysis history details page

9 Report New Experiment Result

To enable vegetable producers' conduct economic analysis using the most recent data, the tool allows vegetable researchers and extension agents to upload their most recent experimental data to the tool's database. To upload new experiment's results to the tool, researchers and extension agents need to create an account and login in the account (For details, please read Section 4.2 and Section 4.3).

After successful login in the account, researchers or extension agents may click the button "Adding Experiment Result" located at the top of web pages (Figure 51).



Figure 51: The **"Adding Experiment Result"** button

At the experiment result adding page, researchers or extension agents may report new experiment results by following two methods.

- Upload experiment result file (Recommended)
 - First, download and fill in the excel template of reporting experiment results. You may download the excel template by clicking the here at the next line of the file upload field (Figure 52). If you plan to upload a journal article or technical report that includes the experiment results, please skip this step.

🖀 Home 🔷 Contact Us	C ⁴ Start New Analysis Adding Experiment Result	User Name
Add Experiment Res	sult	
Experiment		
Please either: • Upload the experiment re or • Fill the blanks of this page or • Upload the experiment re	 sult file, then click "Submit" button at the bottom of the page e, then click "Submit" button at the bottom of the page sult file and fill the blanks of this page, then click "Submit" button at the bottom of the page 	
Attachment		
Files (pdf, word, xlsx, jpg files)	Choose File No file chosen	
If you have multiple ex	periment results you want to upload, please use the templete here to upload th	ie
experiment results	Click "here" to download excel templat	e
Item	Value	

Figure 52: Download the template of adding experiment result

- Second, **upload** the filled file **excel template** or **any other types of files** into the tool by clicking the **"Choose File:** button (Figure 53).

Home Contact Us	C ^{el} Start New Analysis	Adding Experiment Result	Luser Name				
Add Experiment Res	ult						
Experiment							
Please either: • Upload the experiment resorr • Fill the blanks of this page or • Upload the experiment resonance Attachment	ult file, then click "Submit" , then click "Submit" butto ult file and fill the blanks o	" button at the bottom of the page on at the bottom of the page of this page , then click "Submit" button at the bottom of the page					
Files (pdf, word, xlsx, jpg files)	Choose File No file chosen	Click "Choose File" to upload experiment resu	lt				
If you have multiple experiment results	If you have multiple experiment results you want to upload, please use the templete here to upload the experiment results						
Item	Value						

Figure 53: Upload experiment result file

- Third, click the Submit button at the bottom of the page (Figure 54). The Submit button is located at the very bottom of the page, please scroll down the window to find it.

	Others				
	Comment				
		Click "Submit" button to submit experiment result	t		
U	JF IFAS				
Site i	Site Feedback/© 2020/Vegetable Grafting Decision Support Tool/University of Florida, Institute of Food and Agricultural Sciences				
2550 Last	550 Hull Road, PO Box 110680, Gainesville FL 32611-0680 (352-392-3631,Analytics (Google Privacy Policy) Policies: Disability Services UF Privacy SSN Privacy ast Modified: Mon, 6 July 2020 EST				

Figure 54: **"Submit"** button in adding Experiment Result page

- Type experiment result file
 - First, fill in the form at the add experiment result page directly
 - Second, **click** the **Submit** button at the bottom of the page (Figure 54).