

## Application for space allocation Greenhouse Laboratory Center Dürnast

Status 03/2021

**Experiment registration:** for experiments with **fixed GMO placement**  
=> Please submit **registration form** ([ANNEX-9](#)) and **form-Z** ([ANNEX-1.A](#))

**1-On the "Registration Form"** ([ANNEX-9](#)) please fill in all relevant fields if possible.

**2-Prior to the start of the experiment**, a duly completed "**GHL-modified Form-Z**" ([ANNEX-1.A](#)) must be completed, signed and submitted to GHL by the **S1 Project Leader (AG-PL) of the Chair** (AG) in accordance with the Genetic Engineering Recording Ordinance. The first page lists all S1 attachments and their approval dates.

Please fill in the following fields on the Form-Z:

=> **point 7: working group** (chair / AG) and **point 9: number of GMOs** and **start of experiment**.

=> **Signature of the AG-PL at point 11**

The approval of the project is then done by the GHL project leader by signature.

The **AG-PL** also **signs** on the **second page** of the modified Form-Z.

**Please note that only GMOs of risk group 1 may be used at the GHL.**

The project is then approved by the GHL-PL via signature.

The trial organizer is then **only allowed to work with these registered GMOs** under this trial number.

# Registration area occupancy greenhouse laboratory center Dürnast

status 03/2021

**Send the entire electronic document (preferably in Adobe Acrobat) to: [ghl@wzw.tum.de](mailto:ghl@wzw.tum.de)**

Signatures can either be inserted directly into the PDF, the signed page can be scanned and sent separately, or the document can be signed later directly at GHL.

**Note:** Before you are allowed to work independently in the GHL premises, it is necessary for legal reasons to instruct you in the safety guidelines. For this purpose, you have to read the "S1 Guideline for Experimentalists" (Annex-5) on the GHL homepage <https://www.ghl.wzw.tum.de/internal> as well as the information regarding "Occupational Safety at GHL for Project Partners" (Annex-10) and tick this on each registration form and confirm it with your signature.

I have read the "S1 Guide for Trial Investigators" (status 2021)

I have read the „Occupational safety at GHL for project partners“ (status 2021)

place, date	First-Last-name	sign (user)

In the following questionnaire, please indicate as precisely as possible the requirements of the plant species to be cultivated. During the execution of experiments at the GHL Dürnast it is absolutely necessary that experimenters **maintain regular contact with the respective supervising foreman** or the technical/scientific head of the department, so that any problems that arise can be solved together at an early stage.

Trial-number: **GHL**  supervising master / scient. employee:   
*is awarded internally by GHL*

**S1:**  position

**1-about the user**

chair (LS) / working group (FG)

contact person

Tel. / e-mail

Invoice type  single invoice (project)  collective invoice LS/FG  
 SFB924-project-association

**2-plant material and space requirement**

plant species

Type of cultivated area

Quant. plants  /  m<sup>2</sup> / tables (space)

period of use (from / to)  /

experiment-relevant-plant-material:

flours  fruits  leaves  seeds  roots  others (please explain)

**3-climatic-conditions**

**analog to GHL-standard-culture instructions**

(then do not answer 3.1 – 4 further)

**3.1-temperature:** day:  night:  °C (climatic computer)  
(GWH<sup>1</sup>, GWH-KAB<sup>2</sup>, PAR<sup>3</sup>, KS<sup>4</sup>)

*Temperatures should be adjusted according to light availability, if necessary.  
Depending on the cultivation system and the season, the actual temperatures can deviate very the desired temperatures (see: GHL homepage / Internal / GHL cultivation methods).*

**3.2-humidity:** day:  night:  % rel. humidity  
(PAR<sup>3</sup>, KS<sup>4</sup>)

**3.3-lightning:** Info about the DLI can be found at the end of the form **DLI = PPFR \* 0,0036 \* Exposure time**

**PAR<sup>3</sup>, KS<sup>4</sup>:** PAR: max. 500µmol/m<sup>2</sup>; KS: max. 300 µmol/m<sup>2</sup>\*s

PPFR (µmol/m<sup>2</sup>\*s):  duration (h/d):  DLI (mol/m<sup>2</sup>d):

optimal DLI for the culture (mol/m<sup>2</sup>d):

**GWH<sup>1</sup>:** **Assimilation light (ASL)** (max. 100 µmol/m<sup>2</sup>s)  yes  no  
*ap. 60% of the outside light* If yes:

ASL-PPFR (µmol/m<sup>2</sup>\*s):  duration (h/d):  ASL-DLI (mol/m<sup>2</sup>d):

plus 80\*- 60\*\* % of the average DLI depending on the season (mol/m<sup>2</sup>d):

*\*summer (direct radiation), \*\*winter (diffuse radiation)* optimal DLI for the culture (mol/m<sup>2</sup>d):

**Shading from a light intensity of (light stress)**

klux (outside)

**GWH-KAB<sup>2</sup>:** **Assimilation light (ASL)** (max. 200 µmol/m<sup>2</sup>s)

*ap. 30% of the outside light*

ASL-PPFR (µmol/m<sup>2</sup>\*s): 200 duration (h/d):  ASL-DLI (mol/m<sup>2</sup>d):

plus 50\*-30\*\*% of the average DLI depending on the season (mol/m<sup>2</sup>d):

*\*summer (direct radiation), \*\*winter (diffuse radiation)* optimal DLI for the culture (mol/m<sup>2</sup>d):

**Shading from a light intensity of (light stress)**

klux (outside)

**4-culture-substrate / culture-vessels / irrigation / fertilization**

4.1-soil  if others: which

4.2-pots / bowls  quantity  ;  quantity

4.3-irrigation  tide  drip  fertilization  yes  no

4.4-waterquality

\*1: GWH: greenhouse; 2: GWH-KAB: greenhouse-chamber; 3: PAR: climate-chamber (-cold)-raum 4: KS: climate-cabinet

**5-plant protection / limitations due to the experimental question** no treatment

*Only possible in separated culture areas, as risk of spreading to other experiments in case of infestation*

 treatment only after consultation biological plant protection chemical plant protection

**The treatment is carried out exclusively according to BVL guidelines, we ask to take this into account!**

**In artificial light rooms chemical plant protection is only possible to a very limited extent!**

**6-measurement data acquisition (calculation according to expenditure)** sensors are installed**What measurement data is needed?****Further information / possibly a short description of the experiment****Agreements / special services:**

**Is the publication of the title of the experiment and/or the author of the experiment on the GHG homepage desired?**  yes  no

You as the experiment organizer are responsible for the safety of our employees if they have to handle special, experiment-specific equipment and substances (fertilizers, pesticides, chemicals, ...) in your experiment. Therefore, you must have extensive knowledge of these hazards and inform us about them.

**Do your experiments pose risks to humans and the environment?**

 yes  no

**More information or culture dates**

Information to lightning

Ass.-Licht-Intensität  $\mu\text{mol}/\text{m}^2 \cdot \text{s} \cdot 0,0036 \cdot \text{Beleuchtungsdauer} + \text{DLI}$  (Sonne im GWH (KAB) 1)

$\mu\text{mol}/\text{m}^2 \cdot \text{s}$	1	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	
Belichtungsstunden	DLI																				
1	0,0036	0,4	0,5	0,7	0,9	1,1	1,3	1,4	1,6	1,8	2,0	2,2	2,3	2,5	2,7	2,9	3,1	3,2	3,4	3,6	
2	0,0072	0,7	1,1	1,4	1,8	2,2	2,5	2,9	3,2	3,6	4,0	4,3	4,7	5,0	5,4	5,8	6,1	6,5	6,8	7,2	
3	0,0108	1,1	1,6	2,2	2,7	3,2	3,8	4,3	4,9	5,4	5,9	6,5	7,0	7,6	8,1	8,6	9,2	9,7	10,3	10,8	
4	0,0144	1,4	2,2	2,9	3,6	4,3	5,0	5,8	6,5	7,2	7,9	8,6	9,4	10,1	10,8	11,5	12,2	13,0	13,7	14,4	
5	0,0180	1,8	2,7	3,6	4,5	5,4	6,3	7,2	8,1	9,0	9,9	10,8	11,7	12,6	13,5	14,4	15,3	16,2	17,1	18,0	
6	0,0216	2,2	3,2	4,3	5,4	6,5	7,6	8,6	9,7	10,8	11,9	13,0	14,0	15,1	16,2	17,3	18,4	19,4	20,5	21,6	
7	0,0252	2,5	3,8	5,0	6,3	7,6	8,8	10,1	11,3	12,6	13,9	15,1	16,4	17,6	18,9	20,2	21,4	22,7	23,9	25,2	
8	0,0288	2,9	4,3	5,8	7,2	8,6	10,1	11,5	13,0	14,4	15,8	17,3	18,7	20,2	21,6	23,0	24,5	25,9	27,4	28,8	
9	0,0324	3,2	4,9	6,5	8,1	9,7	11,3	13,0	14,6	16,2	17,8	19,4	21,1	22,7	24,3	25,9	27,5	29,2	30,8	32,4	
10	0,0360	3,6	5,4	7,2	9,0	10,8	12,6	14,4	16,2	18,0	19,8	21,6	23,4	25,2	27,0	28,8	30,6	32,4	34,2	36,0	
11	0,0396	4,0	5,9	7,9	9,9	11,9	13,9	15,8	17,8	19,8	21,8	23,8	25,7	27,7	29,7	31,7	33,7	35,6	37,6	39,6	
12	0,0432	4,3	6,5	8,6	10,8	13,0	15,1	17,3	19,4	21,6	23,8	25,9	28,1	30,2	32,4	34,6	36,7	38,9	41,0	43,2	
13	0,0468	4,7	7,0	9,4	11,7	14,0	16,4	18,7	21,1	23,4	25,7	28,1	30,4	32,8	35,1	37,4	39,8	42,1	44,5	46,8	
14	0,0504	5,0	7,6	10,1	12,6	15,1	17,6	20,2	22,7	25,2	27,7	30,2	32,8	35,3	37,8	40,3	42,8	45,4	47,9	50,4	
15	0,0540	5,4	8,1	10,8	13,5	16,2	18,9	21,6	24,3	27,0	29,7	32,4	35,1	37,8	40,5	43,2	45,9	48,6	51,3	54,0	
16	0,0576	5,8	8,6	11,5	14,4	17,3	20,2	23,0	25,9	28,8	31,7	34,6	37,4	40,3	43,2	46,1	49,0	51,8	54,7	57,6	
17	0,0612	6,1	9,2	12,2	15,3	18,4	21,4	24,5	27,5	30,6	33,7	36,7	39,8	42,8	45,9	49,0	52,0	55,1	58,1	61,2	
18	0,0648	6,5	9,7	13,0	16,2	19,4	22,7	25,9	29,2	32,4	35,6	38,9	42,1	45,4	48,6	51,8	55,1	58,3	61,6	64,8	
19	0,0684	6,8	10,3	13,7	17,1	20,5	23,9	27,4	30,8	34,2	37,6	41,0	44,5	47,9	51,3	54,7	58,1	61,6	65,0	68,4	
20	0,0720	7,2	10,8	14,4	18,0	21,6	25,2	28,8	32,4	36,0	39,6	43,2	46,8	50,4	54,0	57,6	61,2	64,8	68,4	72,0	
21	0,0756	7,6	11,3	15,1	18,9	22,7	26,5	30,2	34,0	37,8	41,6	45,4	49,1	52,9	56,7	60,5	64,3	68,0	71,8	75,6	
22	0,0792	7,9	11,9	15,8	19,8	23,8	27,7	31,7	35,6	39,6	43,6	47,5	51,5	55,4	59,4	63,4	67,3	71,3	75,2	79,2	
23	0,0828	8,3	12,4	16,6	20,7	24,8	29,0	33,1	37,3	41,4	45,5	49,7	53,8	58,0	62,1	66,2	70,4	74,5	78,7	82,8	
24	0,0864	8,6	13,0	17,3	21,6	25,9	30,2	34,6	38,9	43,2	47,5	51,8	56,2	60,5	64,8	69,1	73,5	77,8	82,1	86,4	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40->											

Richtwerte DLI

Kultur	DLI (mol/m <sup>2</sup> d)
Stecklinge frühe Phase	4
Stecklinge späte Phase	6
Sämlinge frühe Phase	6
Sämlinge späte Phase	10
Blattgemüse und Kräuter	12
Kopfsalat	12
Gurke	15
Paprika	15
Aubergine	15
Tomate	15
Mais	20

Sonne: DLI (mol/m <sup>2</sup> d) DWD-2013-17 <span style="border: 1px solid red; padding: 2px;">1</span>				+	GHL-Leuchten: DLI (mol/m <sup>2</sup> d) <span style="border: 1px solid red; padding: 2px;">2</span>				
Monat	Freiland	GWH (60%)	GWH-KAB (30%)		Leuchten am GHL	$\mu\text{mol}/\text{m}^2 \cdot \text{s}$	DLI bei 12 h/d	DLI bei 16 h/d	DLI bei 20 h/d
Januar	4.77	2.86	1.72		HID alt GWH	< 50	2.16	2.88	3.60
Februar	7.38	4.43	2.66		HID/CDM neu GWH	max 100	4.32	5.76	7.20
März	14.46	8.67	5.20		HID/CDM neu GWH-KAB	max 200	8.64	11.52	14.40
April	16.58	9.95	5.97		PAR/PKR-LED	max 500	21.60	28.80	36.00
Mai	23.74	14.25	8.55						
Juni	28.63	17.18	10.31						
Juli	29.96	17.98	10.79						
August	25.66	15.40	9.24						
September	15.75	9.45	5.67						
Oktober	9.59	5.75	3.45						
November	5.01	3.00	1.80						
Dezember	4.03	2.42	1.45						

## RECORDING FOR A GENETIC WORK ACCORDING TO GENECHNICAL RECORDING REGULATION <sup>1</sup>

In the case of further work of stage 1, item 7 must be presented in detail on a special sheet. In the case of notified work (first work of stage 1 and further work of stages 2 to 4) or approved work, the documents must be kept as an essential part of the record in accordance with § 2 of the Genetic Engineering Record Ordinance (GenTAufzV).

### 1.-Name and address of the operators:

Technische Universität München, Arcisstr. 21, 80333 München

Gewächshauslaborzentrum, Dürmast 7-10, 85354 Freising, represented by Dr. H. Hausladen

(Managing director – representative of the operator: ILF)

### 2.-Location of the genetic engineering facility in which the genetic engineering work is carried out:

facillity 234 (GHL1), 858 (GHL2), 1189 (GHL3), 1287 (GHL5)

### 3.-PL:

Dr. Susanne Steger  
(Name of S1-project-leader)

### 4.-BBS:

Dr. Stefan Engelhardt  
(Name of biosafety officer)

### 5.-Time of approval of the genetic engineering facility and file number:

facillity 234 (GHL1):	55.1-8791-13.234	building: 4234
facillity 858 (GHL2):	55.1-8791-13.858	building: 4235
facillity 1189(GHL3):	55.1-8791-13.1189.413	building: 4232
facillity 1287(GHL5):	55.1GT-8791,GT_2-1287-1	building: 4105

### 6.-Subject of the work

Cultivation for various experimental purposes according to the questions of the respective working groups.

### 7.-working gruop

Experiment number

chair / working group

location of the experiment

*is filled in by the GHL*




*is filled in by the GHL*

### 8.-security level: S1

### 9.-Time of the start and completion of the genetic engineering work

number of GMOs

start of experiment

End of experiment




*is filled in by the GHL*

### 10.-special events

<sup>1</sup> The records may not be made illegible by deletions or in any other way. No changes may be made that do not reveal whether they were made at the time of the original entry or at a later date.

**11.-Designation and characteristics relevant for the safety assessment, including use of the GMOs** (RG = risk group)

donor		receiver		G-editing*	vector	Nucleic acid		GVO	
name	RG	name	RG		name	name	1. risk potential 2. cleaning level	name	RG
									<b>1</b>
									<b>1</b>
									<b>1</b>
									<b>1</b>
									<b>1</b>
									<b>1</b>

\*G(enome)-Editing-method: If used, please enter here e.g. CRISPR/Cas

**S1-projekt manager of the chair or working group (PL-AG)**

chair / working group

date

name of S1-project manager (PL-AG)

sign PL-AG

**12.-Signature of GHL-project manager**

date

GHL-S1- project manager

sign GHL-PL