

Application for space allocation Greenhouse Laboratory Center Dürnast

Status 03/2021

Experiment registration: for experiments with dynamic GMO placement

alternating GMO inputs and outputs(within an experiment or GHL experiment number)

⇒ **(3) sign-in sheet** ([ANNEX-9.B](#)) and **(4) GHL modified Form-Z** ([ANNEX-1.B](#)) and maintain **(5) GMO documentation list** ([ANNEX-4](#)) if items (1) and (2) are met.

The following is no longer required ... if...

point 1, if the S1 project manager of your chair/AG (PL-AG) completes the form

“**Documentation Commitment Statement**“ ([Annex-3](#)) as already been submitted to GHL.

point 2, if a **current GMO list is already available from your chair/AG**

Point 1 In order to comply with the record-keeping obligation according to the Genetic Engineering Record-keeping Ordinance, all GMO inputs and outputs must be documented for experiments with **dynamically changing GMO placement**. Since the placement of the experiments is often carried out by the experimenter himself, all employees involved as well as the S1 project manager of the chair (AG) must make a one-time commitment that the documentation of all GMO inputs and outputs will be properly implemented. This is done via a "**Documentation Commitment Statement**" ([Annex-3](#)), which can be found on the GHL homepage ([https://www.ghl.wzw.tum.de/ Internal](https://www.ghl.wzw.tum.de/Internal)).

Point 2 In addition to this, a current **GMO list** with all future **numbered GMOs** used in the experiment and the **risk assessment** (according to Form-Z) will be handed over to the **GHL project management** (susanne.steger@wzw.tum.de). Sample: ([Annex 4.B- GMO Sample GMO Documentation](#))

3.-Please fill the relevant fields on the „**Registration Form**“ ([Annex-9](#)).

4.- Pursuant to the Genetic Engineering Recording Ordinance, before the start of the experiment, a duly completed "**GHL-modified Form-Z**" ([Annex-1.B](#)) must be completed, signed and submitted to GHL by the **S1 Project Leader** (AG-PL) **of the Chair** (AG). The first page lists all S1 facilities and their approval dates. With this, the PL-AG confirms that the assigned GMO institute list (see point 2) may be used for the respective experiment and is up-to-date. On the first page, all S1 plants as well as their approval data are listed.

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

=> **Point 7: working group** (chair / wg)

=> **Point 9:** GMO-list-designation (f.e. Tomaten:1-15)

=> **signature of the S1-PL (LS/AG) at point 10**

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

5.-**At the beginning of the experiment** the **experimenter** (applicant) attaches a printed "**GMO documentation list**" ([Annex-4](#)) to the experimental unit (GWH, cabin, PAR) and enters **all GMO inputs and outputs** there independently (also the number of GMOs). This also applies to discarded plants that are to be autoclaved later by GHL personnel (please discuss with GHL personnel). These lists remain at the experimental unit until the end of the experiment and are added by the GHL-PL to the records to be archived.

Registration area occupancy greenhouse laboratory center Dürnast

status 03/2021

Send the entire electronic document (preferably in Adobe Acrobat) to: 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	signature (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 / m² / 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

(dann 3.1 – 4 nicht weiter beantworten)

3.1-temperature: day: night: °C (climatic computer)
(GWH¹, GWH-KAB², PAR³, KS⁴)

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
(PAR³, KS⁴)

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

PAR³, KS⁴: PAR: max. 500µmol/m²; KS: max. 300 µmol/m²*s
 PPFR (µmol/m²*s): duration (h/d): DLI (mol/m²d):
 optimal DLI for the culture (mol/m²d):

GWH¹: **Assimilation light (ASL)** (max. 100 µmol/m²s) yes no
ap. 60% of the outside light If yes:
 ASL-PPFR (µmol/m²*s): duration (h/d): ASL-DLI (mol/m²d):
 plus 80*- 60** % of the average DLI depending on the season (mol/m²d):
 *summer (direct radiation), **winter (diffuse radiation) optimal DLI for the culture (mol/m²d):
Shading from a light intensity of (light stress)
 klux (outside)

GWH-KAB²: **Assimilation light (ASL)** (max. 200 µmol/m²s)
ap. 30% of the outside light
 ASL-PPFR (µmol/m²*s): 200 duration (h/d): ASL-DLI (mol/m²d):
 plus 50*-30**% of the average DLI depending on the season (mol/m²d):
 *summer (direct radiation), **winter (diffuse radiation) optimal DLI for the culture (mol/m²d):
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 GH home page 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

Information to lightning

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

$\mu\text{mol}/\text{m}^2\text{s}$	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	63,3	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	38,8	43,2	47,5	51,9	56,2	60,5	64,8	69,1	73,4	77,7	82,0	86,4	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40->											

Richtwerte DLI

Kultur	DLI (mol/m²d)
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/m²d) DWD-2013-17 1

GHL-Leuchten: DLI (mol/m²d) 2

Monat	Freiland	GWH (60%)	GWH-KAB (30%)
Januar	4.77	2.86	1.72
Februar	7.38	4.43	2.66
März	14.46	8.67	5.20
April	16.58	9.95	5.97
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

Leuchten am GHL	$\mu\text{mol}/\text{m}^2\text{s}$	DLI bei 12 h/d	DLI bei 16 h/d	DLI bei 20 h/d
HID alt GWH	< 50	2.16	2.88	3.60
HID/CDM neu GWH	max 100	4.32	5.76	7.20
HID/CDM neu GWH-KAB	max 200	8.64	11.52	14.40
PAR/PKR-LED	max 500	21.60	28.80	36.00

Further information or culture data

RECORDING FOR A GENETIC WORK ACCORDING TO GENECHNICAL RECORDING REGULATION ¹

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, Dürnast 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

is filled in by the GHL

chair / working group

location of the experiment

is filled in by the GHL

8.-security level: **S1**

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

GMO-list: no.: from/to

start of experiment

end of experiment

is filled in by the GHL

10.-Signature of S1-project-manager (chair / working group)

date

S1-PL-LS/AG name

signature S1-PL-LS/AG

date

Dr. Susanne Steger

GHL-PL name

signature GHL-S1-PL

¹ 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.

Sample Examples (GMO-lists and GMO-documentation-lists)

GMO-list (f.e. excel-formate)

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

GMO no.	donor name	RG	receiver name	RG	G-Editing*	vector name	nucleic acid name	GMO name	RG	else
1										
2										
3										
4										
5										
...										

Example GMO-documentation lost (attach to the outside of the test unit) and must be carried out independently by the VA or instructed personnel!

Analogous to the template [ANNEX 4](#) **GVO-documentation list**

date	GMO-no	number of plants	incomings	outgoings	name in block letters (Implementing person of the AG)	signature
01.01.2020	25	26	x		Frau Mustermann	
15.01.2020	40	30	x		Herr Versuchsansteller	
20.01.2020	1	15	x		Herr Versuchsansteller	
01.02.2020	25	15		x	Frau Mustermann	
15.02.2020	40	11		x	Frau Mustermann	
22.02.2020	2	30		x	Herr Versuchsansteller	
25.02.2020	1	40	x		Herr Versuchsansteller	
	...	15		x	Frau Mustermann	

