NASA®

NASA is an aqueous concentrate containing 360g/L glyphosate (480g/L 41.0% w/w of the isopropylamine salt) and a non tallowamine surfactant.

NASA is a foliar applied herbicide for control of annual and perennial grass and broadleaf weeds before sowing or planting all crops, for use preharvest in cereals and certain other crops, destruction of grassland and in stubbles, orchards, forestry and non-crop areas.
The Control of Substances Hazardous to Health Regulations (COSSH) may apply to the use of this product at work.

Name and address of approval holder:
Agria SA, Asenovgradsko shose, 4009 Plovdiv, Bulgaria., +0359 32 273 500

For the emergency information telephone National Poisons Information Service at one of the following numbers:

London 020 7635 9191
Belfast 01232 240503
Birmingham 0121 507 5588
Penarth 01222 709901
Edinburgh 0131 536 2300
Leeds 0113 243 0715
Newcastle 0191 232 5131

WARNING

H400 – Very toxic to aquatic life
H411 – Toxic to aquatic life with long lasting effects

Prevention

P201 – Obtain special instructions before use
P202 – Do not handle until all safety precautions have been read and understood
P264 – Wash hands thoroughly after handling
P270 – Do not eat, drink or smoke when using this product
P273 – Avoid release to the environment.
P281 – Use personal protective equipment as required
P302+352 – IF ON SKIN: Wash with soap and water
P305+351+338 – IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing

Response

P391 – Collect spillage.

Disposal

P501 – Dispose of contents/containers in accordance with local/ regional/ national/ international regulations (to be specified).
EUH401 - To avoid risks to human health and the environment, comply with the instructions for use.

Name and contact telephone numbers for a distributor

Net contents: 20 Litres

Batch number:

SAFETY PRECAUTIONS: (Precautions marked* are a legal requirement.)
The following safety precautions are additional to the "H" and "P" phrases listed above.

Operator protection.

Engineering control of operator exposure must be used where reasonably practicable in addition to the following personal protective equipment.
WEAR SUITABLE PROTECTIVE GLOVES when handling the concentrate or applying the product.
WEAR SUITABLE PROTECTIVE CLOTHING (WATERPROOF JACKET AND TROUSERS), SUITABLE PROTECTIVE GLOVES AND RUBBER BOOTS when using low-volume nozzles in knapsack sprayers, handheld rotary atomiser CDA sprayers.
However, engineering controls may replace personal protective equipment if a COSSH assessment shows that they it provide an equal or higher standard of protection.
WASH ALL PROTECTIVE CLOTHING thoroughly after use, especially the insides of gloves.
WHEN USING DO NOT EAT, DRINK OR SMOKE.
WASH CONCENTRATE from skin or eyes immediately.
DO NOT BREATHE SPRAY.
WASH HANDS AND EXPOSED SKIN before eating and drinking and after work.
IF YOU FEEL UNWELL, seek medical advice immediately (show the label where possible).

Environmental protection.

DO NOT CONTAMINATE SURFACE WATERS OR DITCHES with the product or its container. Do not clean application equipment near surface water/avoid contamination via drains from farmyards and roads.

Storage and disposal.

KEEP AWAY FROM FOOD, DRINK AND ANIMAL FEEDINGSTUFFS.
KEEP OUT OF REACH OF CHILDREN.
KEEP IN ORIGINAL CONTAINER tightly closed, in a safe place.
RINSE CONTAINER THOROUGHLY by using an integrated pressure rinsing device if available or manually rinse three times. Add washings into the spray tank at the time of filling and dispose of safely

PROTECT FROM FROST.

DIRECTIONS FOR USE.

IMPORTANT. This information is approved as part of the product label. All instructions within this section must be read carefully in order to obtain safe and successful use of this product.

Restrictions/Warnings.
Warnings.
NASA® contains glyphosate a broad spectrum herbicide.
TAKE EXTREME CARE TO AVOID SPRAY DRIFT.
DO NOT MIX, STORE OR APPLY **NASA®** IN UNLINED STEEL OR GALVANISED CONTAINERS/SPRAY TANKS.
DO NOT leave spray solution or mixtures in the spray tank for long periods.
TREATED POISONOUS PLANT SPECIES MUST BE REMOVED BEFORE GRAZING OR CONSERVATION.
Keep stock out of treated areas for seven days to allow the herbicide to become fully effective.
DO NOT feed animals with treated wheat straw.
ENSURE measuring, mixing and handing the dilute solution is conducted in well-ventilated areas.
DO NOT apply pre-harvest treatment to crops to be grown for seed.

Restrictions.
A minimum period of six and preferably 24 hours without rain is required post application to facilitate uptake. Rain during this period may severely reduce activity. Levels of control of stressed weeds (drought, water-logging, high-temperature, frost) may be reduced. Similarly, treating senescing weeds will result in variable levels of control. Best levels of control are obtained when weeds are growing rapidly.
Spray drift will damage or destroy neighbouring crops - do not apply under conditions conducive to spray drift.
NASA® relies on translocation within the weed to be fully effective. Avoid application of lime, fertilisers or other pesticides for at least five days before and after application of **NASA®**.

Note
Strains of some annual weeds (e.g. black-grass, wild-oats, and Italian rye-grass) had to developed resistance to herbicides which may lead to poor control. A strategy for preventing and managing such resistance should be adopted. This should include integrating herbicides with a programme of cultural control measures. Guidelines have been produced by the Weed Resistance Action Group and copies are available from the HGCA, CPA, your distributor, crop adviser or product manufacturer.

There is a low risk for the development of Weed resistance to **NASA®**. Growers are encouraged to implement a Weed resistance strategy based on the following:

a) Good agricultural practice.
b) Good plant protection practice.

To implement the above it is recommended that:

i) Label recommendations are followed rigourously
ii) The adoption of complimentary weed control practices.
iii) Minimising the risk of spreading weed infestations.

iv) The implementation of good spraying practice to maintain effective weed control.
v) Application only under appropriate weather conditions.
vi) Monitoring performance and reporting any unexpected results to Agria SA.

Buffer zones.
NASA® is highly toxic to all plants. For the protection of non-target plants avoid the drift to adjacent cultivated and uncultivated land. In general a 20 m buffer zone should be used. This can be reduced by using drift reduction spray jet technology (50 to 75% is recommended). In the case of the field margins and hedgerows an untreated buffer zone of at least 3 m should be used. For the protection of aquatic organisms a 1 m untreated buffer zone should be used.

Weed species controlled.
NASA® is a foliar acting systemic herbicide with a very broad spectrum of activity resulting in control of both foliar parts of the target plant and below ground roots and storage organs. It is effective against both annual and perennial broadleaved and grass weeds. To be effective **NASA®** must be absorbed and translocated therefore sufficient foliage must be present at application to absorb the material and ideally the plant should be growing rapidly/actively. The following general recommendations apply regarding the amount of foliage present at application.

Perennial grass weeds .
A minimum of 4 to 5 leaves are required with a minimum of 15 cm of new growth.
Perennial broadleaved weeds.
The foliage should be well-developed and growing actively with ideally flower heads formed.

Annual weeds.
Should be growing actively with grass weeds having a minimum of 5 cm of leaf and broadleaved weeds a minimum of two expanded true leaves.

Note. Application to senescing weeds may result in variable levels of control.

Rotational crops.
NASA® is rapidly adsorbed onto soil particles effectively neutralising herbicidal properties. However, although the active ingredient has no soil activity a slight (usually transient) check to succeeding crops has occasionally been recorded particularly where no cultivation (direct drilling) has been employed to establish succeeding crops. In these cases close proximity to decaying treated plant remains has resulted in a check to crop development.

Processing crops.
NASA® may be applied to recommended crops subsequently used for human consumption/ animal feedingstuffs. It is recommended that before treatment of cereal crops pre harvest grown under contract for milling, malting or processing the end user is consulted. This is particularly applicable where it is intended to use the product as a harvest aid.

Methods of application.

NASA® can be applied using a number of different application methods as listed below. Care should be taken to avoid overlaps and spray drift. For conventional applications the sprayer should be half filled with clean water, the agitation started, the correct quantity of **NASA®** added and evenly distributed in the spray tank before completing filling with water. After application the sprayer tank, booms and jets should be thoroughly washed out (a minimum of 3 washes with detergent solution) to ensure all **NASA®** residues are removed from the sprayer.

Tractor mounted equipment

Conventional mounted/trailed hydraulic sprayers.

Application should be made through flat fan jets designed to produce a medium/coarse (as defined by BCPC) quality spray at 1.5 – 2.5bar in water volumes ranging from 80 to 250 L/ha (see specific crop information). The recommended forward speed is 4 to 9 kph.

Mounted/trailed hydraulic sprayers fitted with rotary atomisers.

Rotary atomiser units should produce a droplet spectrum (VMD - volume medium diameter) of between 200 - 300µm. Application should be made in approximately 40 L/ha at a forward speed of 4 to 9 kph.

Hand held applicators.

Conventional hydraulic knapsack applicator.

Primarily used for spot treatment in forestry, orchards, green cover on land not being used for crop production, natural services not intended to bear vegetation and pre-cultivation. The knapsack should be fitted with a spray jet producing a medium to course (as defined by BCPC) spray droplet. Depending on the jet fitted application rates and can vary from 100 to 300 L/ha.

Example

To apply 4.0L/ha of **NASA®** in 200 L/ha add 200mls of product to 9.8 litres of water.

Hand held rotary atomisers.

Primarily used in non crop situations where overall application is desired. Calibrate the equipment to apply between 10 – 20L/ha at a walking speed of 1m/sec.

Crop specific information.

1. Preharvest use in arable crops.

The following table shows recommended application rates of **NASA®** for preharvest use.

Crop.	Weed species	Infestation level	Application rates (L/ha)	Volume of application *
Cereal crops (wheat, barley & oats)	Common couch	25 shoots/m^2 26-75 shoots/m^2	2.0** 3.0 4.0	80-250 L/ha (Rotary atomisers – 40 L/ha)
	Perennial broadleaved weeds and other perennial	All species	4.0	
	Annual grasses green crop cereal stems and leaves	All species	1.5**	
	Common couch	Up to 75 shoots/m^2	3.0 4.0	

Oilseed rape	Perennial broadleaved weeds other perennial	All species	4.0	200-250 L/ha
	Annual weeds	All species	3.0	
	Crop desiccation prior to direct harvesting	-	3.0	
Combining peas & field beans	Common couch	Up to 75 shoots/m^2	3.0 4.0	80 - 250L/ha (Rotary atomisers –
	Perennial broadleaved weeds and other perennial	All species	4.0	
Linseed	Common couch	Up to 75 shoots/m^2	3.0 4.0	80-250 L/ha
	Perennial broadleaved weeds and other perennial grasses	All species	4.0	
	Crop desiccation prior to direct harvesting	-	3.0	

* Application volumes for conventional hydraulic sprayers.
** A glyphosate specific adjuvant is recommended to enhance control (eg ELO, Frigate or similar). **DO NOT** - add an adjuvant if the product is being applied using a rotary atomiser.

Application notes.

Cereal crops.

DO NOT TREAT CROPS GROWN FOR SEED.
DO NOT use treated straw as a horticultural mulch.
The moisture content of cereal crops should be below 30% at application.
A minimum of 7 -14 days should elapse between application and harvest for barley and oat crops and ideally 14 days for wheat crops.
If adverse climatic conditions develop post application allow up to 14 days before harvest particularly if applications are targeted at broadleaved weed control.
Rates of 1.5 L/ha will not control annual nettle, volunteer potatoes, Rosebay willow herb and Polygonum sp.

Oilseed rape.

DO NOT TREAT CROPS GROWN FOR SEED.
DO NOT treat crops with significant levels of secondary re-growth.
DO NOT treat late maturing areas of the crop caused by pigeon damage or water logging.
The moisture content of the seeds should be below 25% at application.
Interval before harvest - oilseed rape 14-21 days.

Combining peas and field beans.

DO NOT TREAT CROPS GROWN FOR SEED.
The moisture content of the seeds should be below 25% at application.
A minimum of seven days should elapse between application and harvest.

Linseed.

DO NOT TREAT CROPS GROWN FOR SEED.

The moisture content of the seeds should be below 30% at application. (Seeds are light brown and the capsules are completely brown – stems & leaves are green/yellow green).
A minimum of 14 days should elapse between application and harvest. (A delay of up to 28 days may be necessary before harvest).
Late application may result in poor weed control due to weed senescence.

2. Use in stubbles and green cover on land not being used for crop production.

The following table shows recommended application rates of **NASA®** for application to undisturbed stubble and for application to pre cultivated land treatment prior to crop establishment.

Crop.	Weed species	Infestation level	Application rates (L/ha)	Volume of application *
Stubbles undisturbed (autumn or spring)	Common couch	<75 shoots/m^2 >75 shoots/m^2	3.0 4.0	80-250 L/ha (Rotary atomisers – 40 L/ha)
	Other perennial grasses	All species	4.0	
	Volunteer potatoes (autumn application	-	4.0	
Stubbles/ pre cultivated land.(autumn or spring)	Volunteer cereals, annual grasses and annual broadleaved weeds.	All species	1.5**	80-250 L/ha (Rotary atomisers – 40 L/ha)

* Application volumes for conventional hydraulic sprayers.
** A glyphosate specific adjuvant is recommended to enhance control (eg ELO, Frigate or similar).

Application notes.
DO NOT CULTIVATE BEFORE TREATMENT.
Allow sufficient time for volunteer potatoes and common couch to make sufficient foliage before application. Common couch should have a minimum of 15 cm of new growth and volunteer potatoes should be allowed to re-grow for 21 days before treatment.
Under climatic conditions favourable for translocation of **NASA®** allow a minimum of 7 days to elapse between application and cultivation. Under less favourable weather conditions a longer interval of 14-21 days is recommended.

3. Grassland destruction/weed control in grassland.

The following table shows recommended application rates of **NASA®** for grassland destruction and control of grassland weed species.

Crop.	Weed species	Infestation level	Application rates (L/ha)	Volume of application *
Short rotation Ryegrass leys, long rotation leys, permanent pasture	Grass sp.	Short rotation ryegrass[A]	3.0	150-250 L/ha
		2-4 year old leys[B]	4.0	
		4-7 year old long leys[C]	5.0	
		Permanent pasture	6.0	

[A] With annual weeds.

[B] With perennial grass weeds.

[C] With perennial broadleaved weeds

Application notes.

DO NOT apply lime, fertiliser or other pesticides before treatment or within five days of **NASA®** application.

Re-drilling following destruction of 1-2 year old leys can take place a minimum of 14 days post application providing all surface trash (no grass matt) is removed.

For destruction of long-term leys (with some matt) it is recommended application should be made in the autumn and drilling delayed until the following spring.

Recommended application timings.

1. Re-growth after grazing or mowing.
2. Before grazing or cutting.

NASA® is best applied between the months of June to October when the grass height is between 30 and 60 cm. The sward should not be too dense and contain no mature seeds.

Utilisation of treated grass crops.

A minimum of 5 days must lapse between application and utilisation.

Farm animals may graze treated grass or be fed conserved treated grass in the normal way.

POISONOUS PLANTS MUST BE REMOVED AND DESTROYED BEFORE GRAZING OR MOWING.

Grassland destruction - weed control table.

NASA® application rate (L product/ha).			
3.0	**4.0**	**5.0**	**6.0**
Annual Meadow grass	Black bent	Bracken*	Common ragwort
Common chickweed	Broadleaved dock	Common sorrel	Hard rush
Common mouse ear	Cock's foot	Common nettle	Heath rush
Docks (seedlings)	Common bent	Creeping Buttercup**	Jointed rush
Italian rye-grass	Common couch	Creeping Thistle	Purple Moor grass

Mayweed species	Creeping bent	Daisy sp	Mat grass
Meadow fescue	Creeping soft grass	Dwarf Thistle	Red fescue
Meadow foxtail	Curled dock	Perennial sowthistle	White clover***
Rough Meadow grass	Perennial rye-grass	Red clover	Yellow rattle
Speedwell species.	Plantain species	Sedges	Sheep's fescue
Timothy	Soft brome	Sheep's sorrel	
	Yorkshire fog	Soft rush	
		Spear Thistle	
		Tufted hair grass	
		Yarrow species.	

* Bracken should be treated when fronds are fully extended.
** Creeping Buttercup should be treated at flowering.
***White Clover should be treated one month after cutting to allow re-growth.

4. Natural surfaces not intended to bear vegetation.

The following table shows recommended application rates of **NASA®** for destruction of weeds on land not intended to bear vegetation.

Crop.	Weed species	Infestation level	Application rates (L/ha)	Volume of application *
Land not intended to bear vegetation.	Annual weeds Perennial grass weeds. Perennial	All species	1.5** 4.0 6.0	80-250 L/ha (Rotary atomisers

* Application volumes for conventional hydraulic sprayers.
** A glyphosate specific adjuvant is recommended to enhance control (eg ELO, Frigate or similar). **DO NOT -** apply an adjuvant when using a rotary atomiser

Application notes.

The recommendations above include use of agricultural/horticultural land prior to sowing and to control re-growth in root crop storage areas. In addition weed control around buildings, fence lines, stack yards, road margins, paths and dry ditch margins.
DO NOT USE IN OR ALONGSIDE HEDGEROWS.
DO NOT USE UNDER GLASS OR POLYETHYLENE.
ALLOW SEVEN DAYS TO ELAPSE PRIOR TO DRILLING/PLANTING.

Apply this product carefully. Insure spraying takes place only when weeds are actively growing (normally March to October) and is confined only to those visible weeds included in the 30 cm swath covering curb edge and road gulley - do not overspray drains.

5. Use in orchards.

The following table shows recommended application rates of **NASA®** for use in orchards.

Crop.	Weed species	Infestation level	Application rates (L/ha)	Volume of application *
Top fruit pre planting.	Perennial grass weeds and perennial broadleaved	Crop stubbles - all species. Pastures - all species	4.0 5.0	200-250 L/ha (Rotary atomisers – 40 L/ha)
Within orchards established for 2 years (apple, pear, plum, cherry, damson)	Perennial grass weeds and perennial broadleaved weeds.	Most species.	5.0	200-400 L/ha (optimum volume 250L/ha)

* Application volumes for conventional hydraulic sprayers.
** A glyphosate specific adjuvant is recommended to enhance control (eg ELO, Frigate or similar). **DO NOT -** apply an adjuvant when using a rotary atomiser

Application notes.

Planting of new orchards may take place seven days after application.

The use of **NASA®** for control of annual and perennial weeds should only take place in orchards established for two years.
Applications for weed control in orchards should take place either in the autumn after leaf fall or in the spring (apple - before “Green cluster”, stone fruit – before “white bud”).
The pre harvest interval for all fruit crops is 42 days.

6. Forestry applications.

The following table shows recommended application rates of NASA for forestry use.

Crop situation.	Weed species	Infestation level	Application rates (L/ha)	Volume of application *
Forestry Pre planting	Annual weeds Perennial grass weeds. Perennial broadleaved weeds	Arable land	4.0	200-400 L/ha (Rotary atomisers
		Grassland	5.0	
Post planting directed applications. (Conifer release)	Annual and perennial broadleaved and grass weeds, woody broadleaved weeds.	Spot treatment.	4.0	200–250 L/ha (see methods of application for Knapsack sprayers.)
	Bracken, beach, sycamore, oak, ash, hazel bramble and willow		3.0	
	Heather (peat soils)		4.0	
	Heather (mineral soils),		6.0	
	Rhododendron sp.		10	
Post planting overall dormant season application	Grass weeds including black bent, common couch, creeping soft grass, false oat grass, cock's foot, purple moor grass, wavy hair grass, Yorkshire fog	All levels With optimum timing and conditions	3.0	200-400 L/ha and hand held equipment.
		Under slightly less favourable conditions	4.0	
Stump application for chemical thinning	Prevention of coppice formation and re-growth from stumps of Deciduous		10% solution in water	Hand held equipment
	Rhododendron and coniferous species		20% solution in	
Chemical thinning by injection	Coniferous and deciduous species.		2.0mls NASA /cut/10cm stem diameter (or less)	Hand held equipment

* Application volumes for conventional hydraulic sprayers.

** A glyphosate specific adjuvant is recommended to enhance control (eg ELO, Frigate or similar).

Application notes.

Forestry- Pre planting.

Planting may take place seven days after application.

Post planting directed spray application.
DO NOT CONTAMINATE YOUNG TREES. A TREE GUARD IS ESSENTIAL.
Bracken - treat when frond tips are unfurled but before senescence.
Heather - ideally treat from late August to the end of September.
General weed control - ideally treat from June to August before weeds senesce.
Rhododendron - may be controlled at 8.0 L/ha if a specific adjuvant such as "Mixture B" is included at rates specified in the adjuvant manufacturer's recommendations.

Post planting overall treatment.
DO NOT OVERALL SPRAY TREES GROWN FOR ORNAMENTAL PURPOSES.
Overall applications should only be made when the trees are fully dormant and leader growth has hardened. Species tolerant to NASA at the recommended rates of use are as follows.

Corsican pine	Norway spruce	Lawson Cyprus
Lodgepole pine	Sitka spruce	Western Red Cedar
Scots pine.		

Douglas fir and Noble fir - apply when new growth and leaders have hardened - DO NOT TREAT in the spring.
Bracken - treat when frond tips are unfurled but before senescence.
General weed control - ideally treat before weeds senesce. If weeds are senescing levels of control may be reduced.
It is advisable to treat a small area initially to ensure crop safety before using widespread applications in subsequent years.

Stump application/chemical thinning by injection.
Application should take place as soon as possible after felling. Application should take place within seven days or treatment effectiveness may be reduced.
The injection technique should not be used in periods of active sap flow in the spring and early summer.
Using a hatchet, saw or knife cut a single notch in trees to be controlled up to 10 cm diameter. Apply 2.0mls of NASA formulation using a suitable treatment device such as a spot gun. For larger trees increase the number of notches made depending on treat diameter eg 20cms = 2 notches, 30cm = 3 notches. The number of notches should be evenly spaced around the diameter of the trunk.

7. Compatibility.
NASA may be tank mixed with specified adjuvants to enhance control. Please check with your distributor to determine the correct adjuvant to use.
DO NOT tank mix this product with other pesticides or fertilisers.

Note.
Use of the incorrect adjuvant may actually reduce the level of control achieved with NASA.

CONDITIONS OF SUPPLY
All goods supplied by Agria SA are of high grade and we believe them to be suitable but as we cannot exercise control over their mixing and use, all conditions and warranties, statutory or otherwise, as to the quality of or fitness for any purpose of our goods are

excluded and no responsibility will be accepted by us for any danger or injury whatsoever arising from their storage, handling, application or use.